WAKE COUNTY MEDICAL SOCIETY SINCE 1903

WAKE COUNTY PHYSICIAN MAGAZINE

OCTOBER 2018 | Vol. 23 No. 4

YOUNG MOORE ATTORNEYS

WAKE COUNTY MEDICAL SOCIETY SINCE 1903

Young Moore and Henderson, P.A., in conjuction with Wake County Medical Society, invites you to join us for a complimentary dinner and seminar designed specifically for medical care providers

TIPS ON FINANCIAL PLANNING & RETIREMENT

You know what it takes to have a successful medical practice.
Do you know what it takes to continue your success into retirement?

WHEN:
Tuesday, October 16, 2018
5:30 p.m. - 7:30 p.m.

WHERE:
Young Moore and Henderson, P.A.
3101 Glenwood Ave, Ste 200, Raleigh, NC 27612
(919) 782-6860

PROGRAM:
Kathleen will help you assess your financial readiness for retirement and provide strategies to help you to live the life you aspire to during retirement.

Rudy will review estate plan documents you should have and give an overview of tax and estate planning considerations as you contemplate retirement.

Elizabeth will share key points to consider as you plan for a smooth transition of your practice.

Speakers

Kathleen W. Burkett, CFP®
Triangle Securities Wealth Management, Inc.
Managing Director Retirement and Life Planning

Rudy L. Ogburn
Young Moore and Henderson, P.A.
Trusts, Estates, & Wealth Preservation Attorney

Elizabeth P. McCullough
Young Moore and Henderson, P.A.
Health Care Attorney

For more information or to register for this event, please visit the events section of www.youngmoorelaw.com or contact Beth O'Reilly at Beth.OReilly@youngmoorelaw.com or (919) 782.6860 ext.107. Seating is limited. Please R.S.V.P. by Tuesday, October 9, 2018.

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OCTOBER 2018

Mark your calendar

WCMS UPCOMING EVENTS

FINANCIAL PLANNING SEMINAR
OCT. 6, 2018 • 5:30-7:30 PM
AT YOUNG MOORE & HENDERSON

WCMS BOOK CLUB
OCT. 30, 2018 • 6:00 PM
AT WCMS OFFICES

YOUR VOTE MATTERS
MIDTERM ELECTIONS
TUESDAY, NOV. 6, 2018

WCMS/ALLIANCE GATHERING
RESCHEDULED DUE TO WEATHER.
DATE & TIME TO BE ANNOUNCED

WCMS ALLIANCE POE CENTER FUND RAISER LUNCHEON
MONDAY, NOV. 26, 2018
WAKEMED OFFICE

WCMS ANNUAL MEETING
DECEMBER 13, 2018
CAROLINA COUNTRY CLUB

WakeDocs.org

Call for Writers

The Wake County Medical Society is inviting its members to write articles for upcoming issues of the Wake County Physician Magazine. Wake County Medical Society members wishing to write an article for publication are asked to submit a brief five sentence proposal.

Proposed article summaries could focus on your first person accounts of the personal side of practicing medicine (e.g., a patient overcoming all odds and achieving a positive outcome, experience with grief/overcoming grief, your best day practicing medicine, or care management success stories, etc.) or any other human interest story that might appeal to our readership-keeping in mind that anything resembling promotion of a current practice or practitioner, or taking a political stance would not be usable, with the final say on such matters resting with the editorial board. Please email your brief proposal to Paul Harrison, editor, by **December 3, 2018** at pharrison@wakedocs.org. We would like to include your article in our next publication—January 2019 which will be posted on our website. Thanks!

Paul Harrison

WAKE COUNTY PHYSICIAN MAGAZINE
A WAKE COUNTY MEDICAL SOCIETY PUBLICATION

Paul Harrison, Editor

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is a clinical pharmacist with Community Care of Wake and Johnston Counties. Prior to employment with WCMSCHF, she worked three years as a community pharmacist with Kroger Pharmacy in the Raleigh-Durham area after completing a PGY1 residency year with Kroger Pharmacy and the UNC Eshelman School of Pharmacy. She enjoys precepting student pharmacists from her alma mater, the University of North Carolina (UNC) Eshelman School of Pharmacy and is a member of the North Carolina Association of Pharmacists (NCAP).

PATRICK BROWN, PHARMD
is the Executive Director of the North Carolina-based Mutual Community Pharmacy Enhanced Services Network (CPESN). He is a graduate of the UNC Eshelman School of Pharmacy and completed a PGY1 Community Pharmacy Practice Residency with Moose Pharmacy and the UNC Eshelman School of Pharmacy. In addition to his role with Mutual CPESN, Patrick is an Assistant Professor of Clinical Education at the UNC Eshelman School of Pharmacy, where he is Co-Director of the School's Independent Pharmacy Ownership Residency Program and teaches in various settings. He lives in Durham with his wife (Victoria), and pets (Scout and Leslie). In his spare time he enjoys cooking, board games and all things Star Wars.

Ben MacDonald, RN, CCM
is a nurse care manager with Community Care of Wake and Johnston Counties (CCWJC). Over the last 5 years, Ben has worked closely with the Advanced Practice Paramedics of Wake County to develop CCWJC's CHF program. Prior to joining CCWJC, Ben has worked as an emergency room nurse and as a medical writer and project manager for Aquinas Leadership Group. He has a passion for finding creative, expedient ways to help patients resolve social and health disparities in order to live healthier, happier lives.

POLYPHARMACY AND MEDICATION OPTIMIZATION: THE MEDICATIONS THAT PHARMACISTS HATE TO DISPENSE AND LOVE TO DE-PRESCRIBE

By Stephanie Craycroft-Andrews, PharmD, BCACP with Community Care of Wake and Johnston Counties and Nakiya Whitfield, PharmD Candidate from the UNC Eshelman School of Pharmacy Class of 2019

Polypharmacy: An Introduction to a Common Phenomenon

"Polypharmacy" in the broadest sense simply means the concurrent use of multiple medications. The term has also been used to describe "more medications than are clinically indicated in a patient," or the use of a specific number of medications (i.e., four or more, five or more, six or more, etc., depending on the source). In any definition, the concern of polypharmacy is a common one. In fact, 29% of American adults take five or more medications (Slone Epidemiology Center at Boston University 2006.), and 36% of older adults taken five or more (JAMA Intern Med 2016; 176:473-82.). This figure is only expected to rise as new medications develop and the average lifespan increases.

Medication Optimization at Transitions of Care

Patients are at particularly high risk of suffering adverse events due to polypharmacy at transitions of care. As patients transition from ambulatory care to acute care settings and back, each handoff presents a new opportunity for healthcare providers to share information pertinent to that patient's care. But each transition also presents the chance for a healthcare-related error if information is communicated ineffectively or incompletely. A study of 521 patients enrolled in a transitions of care program found that more than 90% of discharge summaries reviewed contained at least one potential drug therapy problem, such as a therapeutic duplication, medication omission, or contraindication to therapy (The Permanente Journal 2007; 11(4):4-9). This fact is no surprise to clinical staff at Community Care of Wake and Johnston Counties (CCWJC), and is one of the reasons why Complex Care Management services, including a Comprehensive Medication Review by a Clinical Pharmacist, is often most crucial in the first thirty days after the member (i.e., "patient") is transitioned home and becomes the primary party responsible for his or her own health. The Care Management program of CCWJC aims to empower our members to self-manage their conditions outside of the hospital in order to prevent readmissions.

Community Care and the De-prescribing Clinical Pharmacist

De-prescribing is the review and identification of potential medications to be "ceased, substituted, or reduced (J Pharm Pract Res 2003; 33:323-8.)." Within CCWJC, a local network of Community Care of North Carolina (CCNC), Clinical Pharmacists review our members' discharge summaries, fill histories, and self-reported home med lists for opportunities to optimize their medication regimens as soon as possible after a transition of care. In the North Carolina Medicaid population, where the primary barrier to adherence is often financial, de-prescribing unneeded medications helps decrease costs for both members and payers. Potential targets for de-prescribing include medications that are being used to treat the side effect of another medication according to a "prescribing cascade", medications for which there is no clear indication on a member's Problem List, medications that pose drug-drug interactions or additive adverse effects when used together, medications started in the hospital that may no longer be needed, and medications that can be combined to help simplify a prescription regimen.

Potential Opportunities by Drug Class

While polypharmacy affects all socioeconomic classes and is of particular significance in the elderly, as a Clinical Pharmacist with CCWJC, the majority of the medication reviews I complete are for Medicaid recipients less than 64 years of age who are attempting to self-manage multiple chronic conditions after a transition of care. Few if any of our members are prescribed less than six medications, and it is not uncommon to receive discharge summaries from local hospitals with lists of twenty or more medications. Our members frequently report that they take too many medications, that they can't afford them, or that they do not know why they are prescribed. Below is a list of five medications frequently prescribed and potentially targeted for de-prescribing in the NC Medicaid population:

• Proton Pump Inhibitors

"Anti-Ulcerants" are one of the top ten most frequently prescribed medications (*https://www.thebalance.com/the-most-prescribed-medications-by-drug-class-2663215)*. In particular, Proton Pump Inhibitors (PPIs) like omeprazole are among the highest-selling classes of drugs in the U.S, with $9.5 billion in sales in 2012 (Consumer Reports Best Buy Drugs 2013; 1-18). Many people do not known that the recommended duration of therapy for most common indications, including gastroesophageal reflux disease (GERD) is only four to eight weeks (Am J Gastroenterol 2013; 108:308-328.). Although PPIs can be purchased without a prescription, they are expensive to the consumer when purchased out-of-pocket (and to tax payers when purchased by NC Medicaid), and chronic use increases risk for severe adverse events, including C. *difficile* infection and deficiencies in magnesium, calcium, and vitamin B12. In fact, PPIs are identified in the Beers Criteria as potentially inappropriate medications, to be avoided long-term in patients over age 65, due to risk of C. *difficile* infection, bone loss, and fractures (Beers Criteria [AGS 2015]). However, chronic use may be appropriate in certain patients at high risk for gastrointestinal bleeding, such as older patients taking oral corticosteroids or nonsteroidal anti-inflammatory drugs (NSAIDs) chronically, and those with a history of Barrett's esophagitis. **Recommendation:** If a patient started a PPI for gastric cytoprotection in the hospital, or has been taking a PPI for longer than 2 months for an indication of GERD, consider tapering the patient off of the medication by decreasing to the minimum dose and then to every other day. Advise patients to take an over-the-counter antacid as needed for rebound reflux while tapering off. If long-term PPI therapy is warranted, counsel patients that these meds do not provide immediate relief but work best if taken on an empty stomach, 30 minutes prior to eating or taking other medications.

• Opioids

Termed "narcotic analgesics," "opioids," or "opiates," agents like oxycodone, hydrocodone, and morphine are among the most overprescribed medications; the US consumes more than 80% of the global opioid pills even though it has less

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Partnering with Community Pharmacies: A Valuable Prescription for Patients

By Anna Armstrong, PharmD, Pharmacist with Community Care of Wake and Johnston Counties and Patrick Brown, PharmD, Executive Director of Mutual CPESN

What are CPESN® Networks?

Community pharmacy enhanced services networks are groups of pharmacies with a commitment to providing enhanced services that go beyond traditional prescription dispensing. Examples of these services include medication synchronization, medication reconciliation, comprehensive medication reviews, adherence packaging, immunizations, home delivery, and chronic disease education and management. Pharmacy teams work collaboratively with the rest of the patient's healthcare team to optimize medication utilization and prevent adverse events that may result in emergency room visits and/or hospitalizations. Additionally, CPESN pharmacies can share relevant patient information and care coordination details via the Pharmacist eCare Plan.

CPESN USA, LLC is a national clinically integrated network that provides support and services to over 40 local CPESN networks across the country. Mutual CPESN is North Carolina's local network, which covers 96% of the state with almost 200 participating pharmacies. Mutual CPESN is very well represented in Wake County with 15 pharmacies.

North Carolina Roots

The first CPESN network was formed in North Carolina as a network of pharmacies available to handle referrals from Community Care of North Carolina (CCNC) care managers. Shortly after the formation of the network, CCNC was awarded a Centers for Medicare and Medicaid Innovations (CMMI) grant to test a reimbursement model for enhanced pharmacy services. The three year grant launched in 2014 and allowed access to training, technology support, and reimbursement for enhanced services. At the conclusion of year 3, approximately 250 pharmacies had developed new workflow models, invested in technology to support information sharing from their existing dispensing software and provided care coordination and enhanced services to Medicare and Medicaid beneficiaries throughout the state. Reimbursement for enhanced services was based on a per member per month model with adjustments based on patient complexity and pharmacy performance. The following graphic demonstrates the outcomes obtained when primary care, care management and community pharmacy supports are coordinated for complex Medicaid beneficiaries.[1]

*A 2010 performance analysis of Community Care of North Carolina primary care practices with integrated community-based pharmacy supports.

The launch of the first CPESN Network by CCNC generated significant interest from other pharmacy stakeholders throughout the country. As part of the CMMI project, the Multi-State Pharmacy Collaborative was formed to disseminate early learnings from the project and support groups that wanted to develop a similar model in their own area.

Current State

Building on the momentum of the Multi-State Pharmacy Collaborative, CPESN USA was launched in the Fall of 2016. To date CPESN USA has approximately 1800 participating pharmacies in 45 networks in varying stages of development across 40 states. CPESN USA describes itself as a clinically integrated network of community pharmacies that coordinates patient care with broader care teams to provide medication optimization activities and enhanced services for high-risk patients.[1] Each local network and its participating pharmacies are affiliated with CPESN USA and are bound by a set of standards across the national organization. Additionally, each local network makes the ultimate decision on the criteria for participating pharmacies as well as the direction and priorities of the network. The map above shows the currently formed CPESN networks across the country.

As mentioned previously, Mutual CPESN is the local CPESN affiliate in North Carolina. Though sponsored by Mutual Drug, which is a regional wholesaler for independent pharmacies, the CPESN network is an all willing and able network of pharmacies.[1] With nearly 200 pharmacies and 96% geographic coverage, Mutual CPESN has reached 'network adequacy', meaning the network has a sufficient geographic spread and number of pharmacies to cover the state of North Carolina. The majority of Mutual CPESN participating pharmacies were engaged in the CMMI grant and have a track record of providing these enhanced services specifically to a high risk, complex patient population. Mutual CPESN continues to actively recruit participating pharmacies and is pursuing and expanding partnerships with third parties in addition to its ongoing relationship with CCNC.

Exciting Future

North Carolina's Mutual CPESN and similar networks nationwide are gaining recognition for the impact of the enhanced services they provide to patients in their local communities. Physician groups including Community Care Physicians Network (CCPN) and other healthcare providers should look to CPESN pharmacies as a partner for providing quality care through a clinically integrated network. Collaborative practice amongst members of the healthcare team provides benefit to all patients, especially those with extensive medication utilization needs, by helping them achieve their healthcare goals.

Community pharmacy practice is evolving to meet the needs of our changing healthcare system by providing a higher level of care to improve outcomes for our patients. CPESN networks are here to make a difference and are here to stay. Visit *www.cpesn.com* to locate a CPESN pharmacy near you that is ready and waiting to coordinate care with your patients! §

References:

1. CPESN USA website. https://cpesn.com/. Accessed September, 12th 2018.

BOOK REVIEW: MICHIO KAKU'S *"THE FUTURE OF THE MIND"*

*By Assad Meymandi, MD, PhD, DSc (Hon), DLFAPA**

Reprint courtesy of Monday Musings, Volume VIII. No. 32/396

The Future of The Mind
By Michio Kaku
342 pages of text
10 pages of meticulously indexed notes relevant to each discussion
61 pages of index
Doubleday Publishing Company, Inc.
New York, London, Toronto, Sydney, Auckland

Review for Science Books Series

When a publisher sends a book for review, I routinely cast an editorial "screening" glance to separate substance from fluff by noting the book's proportion of text to notes, bibliography, and index. A scholarly and substantial book usually carries an extensive set of notes and references for documentation of almost every line of the book. A high volume of notes and an extensive bibliography assure the reader that the book is not fluff. Such is the book *"The Future of The Mind"* by Dr. Michio Kaku, Professor of Theoretical Physics at the City University of New York (CUNY). The book's subtitle is *"The Scientific Quest to Understand, Enhance, and Empower the Mind"*. The book does all that and more. Faithful readers of this space recall our review of books by psychiatrist Eric Kandel, 2000 Nobel Laureate in Physiology or Medicine, *"The Emergence of the New Science of Mind"*, Stephen Hawking's book *"Standing on the Shoulders of Giants"*, 1989 Nobel Laureate in Medicine or Physiology *"Retroviral Oncogenes"*, by Harold Eliot Vamus, and many others. This book is a continuation of the series on science.

First, a word about the author:

As you see in the picture, Michio Kaku is of Tibetan descent. His grandfather immigrated to the United States to work in the cleanup efforts following the devastating 1906 earthquake in San Francisco. Dr. Kaku was born on January 24, 1947, in San Jose, California. He first became attracted to science as a young child, and while a student at Cubberly High School in Palo Alto, he famously built an atom smasher in his parents' garage. He eventually landed at Harvard University, where he graduated first in his physics class in 1968. From there it was on to the University of California at Berkeley, where he worked at the Berkeley Radiation Lab and earned his Ph.D. in 1972. The following year Kaku lectured at Princeton, but not long after, the Army drafted him. He was trained as an infantryman but was spared combat when the Vietnam War ended shortly before he was scheduled for deployment.

"The Future of the Mind" is Kaku's ninth book. In my view he is a symphonist like Beethoven, Shubert, Mahler, and others, with nine symphonies. I think this, his latest book, is very much like Beethoven's Ninth. It is not just plain physics, raw science and equations, but an intellectual celebration of possibilities. The book carries with it spiritual and artistic messages. For example, in the chapter about Einstein's brain, the author speaks of plasticity of the brain, refuting the past notion that brain does not grow. He brings in subliminally Pauline theology of redemption, possibilities and hope. Brain grows…brain matures…brain gets bigger… brain gets "smarter"…

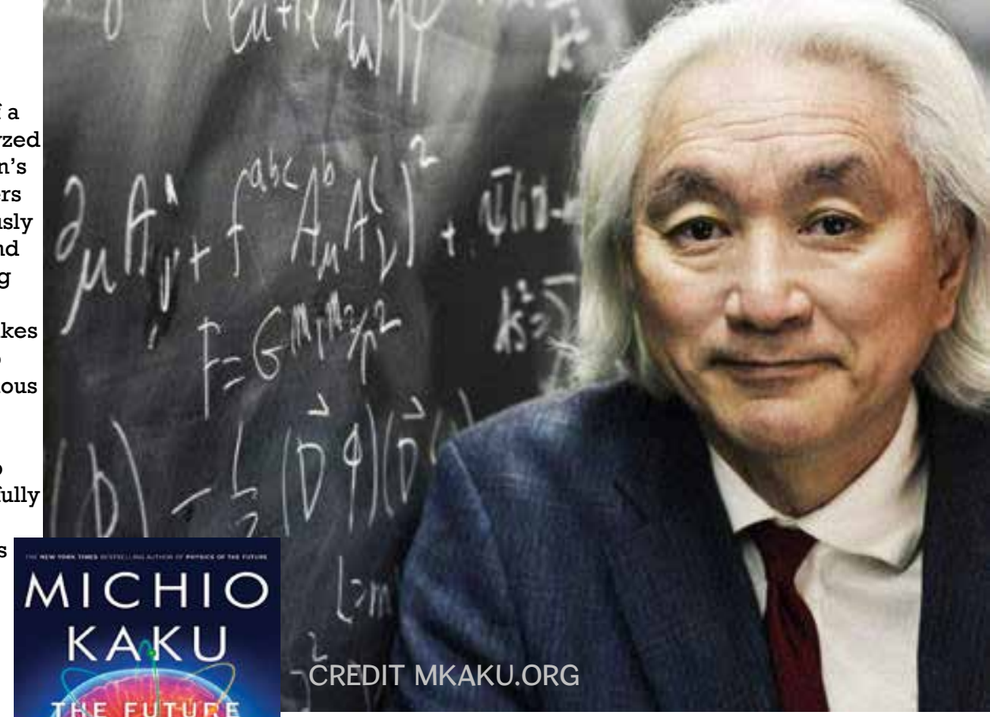
The volume consists of an acknowledgment listing the names of 11 Nobel Laureates, followed by six and a half pages that contain the names of luminaries in science, technology, nano-technology and journalism. They include Ann Druyan, widow of Carl Sagan of Cosmos Studio and John Donoghue, creator of Braingate (see below). Physicians acknowledged include Francis Collins, Director of the National Institutes of Health (University of North Carolina Medical School alumnus) and many bioethicists and environmentalists. The acknowledgment clearly reflects the author's vast contacts. It also presents his humility and humaneness. The acknowledgment is followed by an introduction and three books.

Book I:

The Mind and Consciousness, and his viewpoint of consciousness;

Book II:

Mind over Matter deals with mental telepathy, and telekinesis, and moving objects by will through thoughts and memories. It offers explanation about Einstein's brain with the promise that we can be smarter, and our brain can grow. He gives the example of a 2011 study that analyzed the brains of "London's famous taxicab drivers who have to laboriously memorize 25 thousand streets in the dizzying maze that makes up modern London. It takes three to four years to prepare for this arduous test, and only half of the trainees pass. The brains of the cab drivers who successfully passed the test were studied several years after the test, and it was found that the brains of the taxi drivers who passed the test successfully "were bigger and grown in volume." He proposes while geniuses are born, brain's capacity to grow and become "smarter" is undeniable. The evidence of plasticity of the brain and its capacity to grow, presented in Book II, are most exciting. This is where I make the connection between Kaku's science and Pauline theology of hope, redemption, and possibilities. This is where I hear Beethoven *Ninth's* message of joy belonging to human race…



Book III:

Altered Consciousness elaborates on a most attractive and comprehensive tour de force of artificial intelligence, mind as pure energy, and finally, the future of the mind.

The protean nature of the topics discussed in Book III reflects the author's vast interests and penetrating curiosity. It has meritorious discussion on the diagnosis and treatment of depression. He cites the work of Dr. Helen Mayberg and colleagues at Washington Medical School. Using brain scans, they identified an area of the brain, called Brodmann area 25 (also called the subcallosal cingulate region) in the cerebral cortex that is continuously hypoactive in depressed individuals. Deep brain stimulation (DBS) has astonishing results in relieving depression. Of course, clinically, we reserve this approach for those patients who are treatment resistant and do not respond to pharmacotherapy and psychotherapy.

The chapter on telekinesis illustrates cosmologist Stephen Hawking, a victim of Amyotrophic Lateral Sclerosis (ALS or Lou Gehrig disease) whose many books we have reviewed in this space (the latest was *"Standing on the Shoulders of Giants"*) wore a neuroprosthetic device attached to his glasses with a special feature. Like an Electroencephalogram (EEG or brain wave test machine), it could connect his thoughts to a computer to maintain some contact with the outside world.

These neuroporostheses have profound effect on improving the quality of life of ALS patients, and of those who are quadriplegics, such as stroke victims. He cites the heart rendering story of Cathy Hutchinson who was "trapped" in her body, quadriplegic, for 14 years as the result of a massive stroke. Brown University scientist John Donoghue and colleagues placed a tiny chip on the top of her brain called Braingate (see above reference to John Donoghue) which is connected by wires to a computer. By simply thinking, she gradually learned to control the motion of her arm so to grasp objects. Her thoughts or intentions are translated into

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CCWJC & WAKE APP: PARTNERING TO PROVIDE THE HIGHEST LEVEL OF CARE POSSIBLE.

By Ben MacDonald, RN, CCM with Community Care of Wake and Johnston

Community Care of Wake and Johnston Counties (CCWJC), established in 2003, is one of 13 networks that comprise Community Care of North Carolina (CCNC), a state-wide, provider-led primary care medical home and care coordination infrastructure. Within CCWJC's network, there are approximately 180 primary care medical home sites and 140,000 Carolina Access II Medicaid recipients in Wake and Johnston counties. CCWJC works closely with these primary medical homes, their patients, and community partners with the mission to improve the value of health care for our community by advancing high quality, patient-centered and coordinated care. CCWJC is specialized at providing complex care management, including transitional care, for high risk patients. This is achieved through a multidisciplinary approach that includes a team of nurse and social work care managers (CM), pharmacists, physicians, a psychiatrist, a dietitian, and a strong support team of unlicensed professionals. CCWJC also utilizes CCNC's robust data analysis platform to inform care management strategies and promote continuity of care across the healthcare spectrum.

For years, CCWJC has offered a program tailored to patients with congestive heart failure (CHF). The rationale for such a program is based on the statistically high risk for readmission for patients with CHF, combined with the idea that, through education and support, patients can learn to manage their condition effectively. This can lead to preventing hospital utilization and improving patient quality of life. Using CCNC's analytics to identify hospitalized patients, an embedded CCWJC team member engages the patient while they are in the hospital. Upon discharge, the RN care manager (CM), completes a combination of in-home assessments and telephonic follow up to provide disease education, resolve medication discrepancies, facilitate engagement with medical homes and specialists, and help address social determinants that may compromise the patients' health.

In August of 2015, CCWJC partnered with the Wake County Advanced Practice Paramedics (APPs) in an effort to further enhance the quality of outcomes of the CHF program, and to explore if such a partnership could prove beneficial to other health populations. The APP program consists of a group of specially-trained paramedics with response units spread throughout Wake County. A multifaceted program, one of the APPs' primary aims is to help reduce unnecessary emergency department and hospital utilization. With this goal in common, CCWJC and Wake APPs began to pilot a program to leverage the strengths of both organizations to provide the highest level of care possible.

As CCWJC maintains relationships with medical homes and specialists and provides the data and structure for the longer-term CHF program, APPs offer several distinct enhancements. Available 24/7 and stationed throughout the county, APPs are able to provide in-home assessment and intervention within the critical first 72 hours after discharge. This is especially advantageous for patients who discharge over the weekend or during a holiday, when a nurse care manager may not be immediately available. APPs are able to quickly identify potential red flags, provide education, resolve medication gaps, and lay the foundation for CCWJC CM follow up.

CCWJC's dedicated embedded hospital team strives to enroll eligible patients and schedule the post-discharge APP visit at the bedside. Immediately after discharge, a CCWJC pharmacist reviews discharge medications and notifies the APPs of any potential medication discrepancies. During or immediately after the visit, the APP provides updates to the CCWJC RN CM, and all activity is monitored by the RN CM. Based on initial findings, an APP may complete additional follow up visits, or a joint visit may be completed with the CCWJC RN CM. A 30 day follow up is typically conducted as well, as an enhancement to ongoing telephonic care management.

The case of Mary, a 44 year old patient who was recently admitted for CHF secondary to mitral valve regurgitation, illustrates that impact of this approach. Prior to her admission, Mary knew only that she "had a weak heart" and that doctors were going to monitor her condition. Over a period of time, she found herself becoming increasingly short of breath; she noticed her legs were swelling and that she had to prop herself up on 4-5 pillows in order to breathe at night. One night she found herself unable to catch her breath while sitting in her chair. Panicked, she called 911. She was treated for CHF, started on a number of new medications, provided initial education, and discharged. Identified by CCNC's analytics, CCWJC's embedded RN was able to engage Mary in the hospital and offer the enhanced CCWJC/APP CHF program.

On the day of discharge, CCWJC's RN CM spoke with Mary on the phone. In tears, she reported that she was overwhelmed by her condition; she did not understand her discharge instructions, her medication regimen, or how to care for her condition. The RN CM advised Mary that an APP would be out to see her that day, and that together the nurse and the APPs would help her gain confidence in managing her heart failure. When the APPs responded, they found that Mary had an incorrect dose of her beta blocker and was confused regarding the instructions on her diuretic. The APPs notified the CCWJC RN CM, who was able to contact the cardiologist to clarify the medication regimen. A prescription for the correct dose of the beta blocker was called into the pharmacy, and the APPs were able to pick up the medication and set up a pill organizer with all of Mary's medications for the next week. The CCWJC RN CM was then able to work with Mary's pharmacy to arrange for adherence packaging of her medications moving forward to prevent further confusion. CCWJC's RN continues to provide education and support to Mary, helping her to recognize signs of exacerbation, follow a prescribed action plan, and set goals around modification of lifestyle risk factors. Since discharge, Mary has not needed to return to the hospital.

To date, around 140 patients have participated in the CHF program. Stories such as Mary's provide anecdotal support to indicate that these interventions are improving patient outcomes. Customer satisfaction surveys have indicated a 99% satisfaction rate in the program, suggesting that the interventions are meaningful to the patients. Calculating more concrete data, such as 30 day readmission rates and expenditure savings have been challenging due to the limitations of accessing claims data from payers other than Medicaid. CCWJC continues to refine its data processing techniques to better understand these impacts. A recent analysis of all patients who have participated in the program indicated an approximately 50% reduction in inpatient admissions, although this admittedly does not take into account "pre-and-post" time line congruencies.

Building on the success of the CHF program, CCWJC and Wake APPs are expanding their scope to include other high-risk populations. CCWJC is also in the process of partnering with the Johnston County Community Paramedic Program on a similar initiative. Further development of these programs will provide enhanced care to a broader range of patients and facilitate more comprehensive, statistically significant data analysis. §

Community Care OF NORTH CAROLINA
Community Care of Wake/Johnston Counties

When Did Medicine Join Science and leave Magic and Religious Rituals Behind?

By Jarrett Barnhill, MD, DLAFAPA, FAACAP

If we look backwards in time, science/ natural philosophy, religion and magic were a peculiar amalgam. In that era, their boundaries were fluid and less well differentiated, but even in this primitive state, they were still used to explain what was in the world, how and why things happened, and what people needed to endure and survive. During the Scientific Revolution and later Enlightenment, we forged a boundary between science and magic. But even the great age of reason and materialism did not dissolve the specter of magic from scientific discovery. Chemistry and Physics emerged from alchemy but many scientists like Newton and Boyle dabbled in alchemy. Likewise, Astronomy slowly replaced Astrology but many groundbreaking astronomers were either clergymen or affiliated with the church or used their data to compose Horoscopes.

A partial conclusion: There is a certain tenacity to ideas that make sense or appear to work (intstrumentality and practicality) that assures precedence over counterintuitive, scientific explanations.

The dualism between science and religion was a much more complex problem. Attempts to separate these bodies of knowledge and ritual/ scientific method still generates intense emotional responses, especially for those who dare challenge the other's explanation of how the world works. This is especially true when misinformation abounds and arguments are zealous but not well-informed about the complex historical underpinnings of the relationships between these ideas. From the historical perspective, many of the battles go unresolved because both sides grossly oversimplify the process explaining the other's foundations and assumptions. The "warfare" model between science and religion arose during the late 19th and early 20th century from arguments based on spurious research and apocryphal interpretations. A closer reading of history suggests that even the concept of two separate approaches to knowledge (Gould's "nonoverlapping majesteriae") does not take into account the 2000 years of intertwining historical and cultural give and take as well as repeatedly shifting boundaries.

Several years ago, we explored the inaccuracies in arguments that religion and science were involved in a great struggle. This time we will return to the beginnings of this story and dig a little more deeply into ancient, medieval and early modern history. Our goal is to understand the time when there were no scientists, only natural philosophers. Last time we begin with the Hippocratic school (Natural events are best explained by natural causes). In this series we will begin with St Augustine of Hippo (how new knowledge affect Biblical exegesis), and then briefly touch on the Medieval Scholastics (erroneously characterized as grappling with questions like "how many angels can dance on the head of a pin."

But first, let's go back to the question raised by the title. One way of answering it is to reframe scientific and medical progress in nonlinear terms. This movement drags the boundary between science and traditional beliefs along in a fascinating journey filled with strange entanglements that weave in and out of time. To survive this journey, we need to compare the evolving historical relationship between medical knowledge and the "community standard of care." In the Enlightenment and Scientific Revolutions of the 16-18th centuries, Vesalius, Harvey, and countless other "medical philosophers" stepped around the authority of Galen to redefine a new direct method of observing and studying anatomy, physiology and rudimentary ideas about etiopathogenesis. Unfortunately, these revolutionary ideas did not trickle down to most practitioners. Many continued to practice in line with the authority of ancient sources (Galen) and continued to use Hippocratic and Galenic models to explain and treat illness.

Were these people just rubes, mountebanks or quacks? Well some probably were? Should we take heed? Yes, and the persistence of lingering gaps between new knowledge and their application still requires close scrutiny. Today we still struggle with the transitional boundaries between historical levels of evidence. In particular we still debate the value of anecdotal, personal experience and expert opinion over new data emerging from RCTs, statistical analyses, genetics, physiology, molecular biology and evidence-based, scientific medicine.

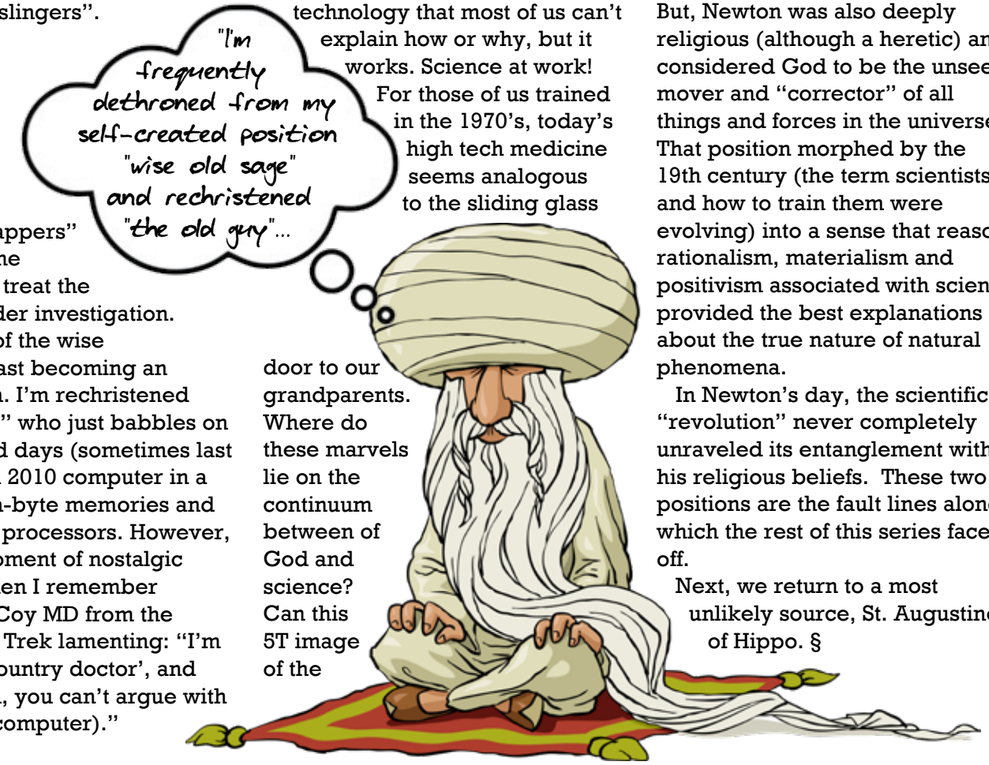
Partial conclusion: Many of us are still cherry picking our interpretations and acceptance of new data to fit into our system of tried and true practices?

Granted we are not bleeding or purging our patients to influence the between balance flow between heat and cold or Humors. But we still struggle to keep up and find it difficult to adapt to and integrate this new knowledge into clinician practice fast enough to keep up in our nanosecond world. As one banished to an ivory tower, I still struggle to keep up with our exploding knowledge base. It is difficult to stay one-step ahead of (or at least no more than one-step behind) these young electronic device "gunslingers". By the time I can drag up an answer from my antiquated memory banks these "whippersnappers" find it, and the algorithm to treat the disorder under investigation.

The myth of the wise old sage is fast becoming an anachronism. I'm rechristened "the old guy" who just babbles on about the old days (sometimes last year). I am a 2010 computer in a world of tera-byte memories and nanosecond processors. However, there are moment of nostalgic revenge, when I remember Leonard McCoy MD from the original Star Trek lamenting: "I'm just an old country doctor', and "Damn it Jim, you can't argue with a machine (computer)."

But I digress and "doth protest too much". We were discussing a time when old knowledge was the gold standard. The motto "the older the better" placed a premium on ancient authority- a partial explanation for the longevity of Galen in medicine and Aristotle in natural philosophy. A crack in the armor may have come when someone quipped, "Science is magic that works". For example, what happens when there is a malfunction in the photoelectric cell critical to operating an automatic door? Providing you do not break your nose, you find another door or tell someone that the door needs repair. But suppose one of your grandparents time warps from 1958 to 2018. If they observed you walking into the glass they might laugh at your stupidity- "why didn't you just open the door?" Suppose the next day they come back and the door opens before they can touch it. "Wow that's like magic". No, it is a technology that most of us can't explain how or why, but it works. Science at work!

For those of us trained in the 1970's, today's high tech medicine seems analogous to the sliding glass door to our grandparents. Where do these marvels lie on the continuum between of God and science? Can this 5T image of the brain be for real, especially for those of us teethed on scintillation scans of the brain that looked like targets from a turkey shoot? Is the god inside the MRI and the same as the one inside photoelectric?



Can these questions solve anyone's eternal questions about the religion-science boundary? The deeply religious might place God in charge of all such actions. He made that door open. Others might not understand the photoelectric effect but marvel at the technological advances or magic that opened this door (instrumental understanding of s second cause). Quantum physicists might provide alternative explanations.

Jump back 400 years to visit Isaac Newton. This natural philosopher and mathematician described light as particulate (corpuscles) and laid down the mathematic laws of gravity that essential got us to the moon and sent Viking out of the solar system. But, Newton was also deeply religious (although a heretic) and considered God to be the unseen mover and "corrector" of all things and forces in the universe. That position morphed by the 19th century (the term scientists and how to train them were evolving) into a sense that reason, rationalism, materialism and positivism associated with science, provided the best explanations about the true nature of natural phenomena.

In Newton's day, the scientific "revolution" never completely unraveled its entanglement with his religious beliefs. These two positions are the fault lines along which the rest of this series face off.

Next, we return to a most unlikely source, St. Augustine of Hippo. §

[De-prescribing continued from page 5]

than 5% of the world's population (*https://www.theguardian.com/us-news/2017/oct/25/americas-opioid-crisis-how-prescription-drugs-sparked-a-national-trauma*). The CDC reported in 2015 that overdoses kill more people per day in the US than car crashes and gun deaths combined, and that US doctors prescribed enough opioids to medicate every American around the clock for three weeks. These powerful medications carry risks of respiratory depression and death, and have gained national attention around efforts to avoid unintentional opioid-induced respiratory depression among users. The risk of adverse events with opioids is increased when used concomitantly with other medications like benzodiazepines and even non-scheduled substances like gabapentin (PLOS Medicine 14(10): e1002396.). The new Strengthen Opioid Misuse Prevention (STOP) Act limits first-time prescriptions of opioids to no more than 5 days for acute pain and no more than 7 days for post-surgical pain. **Recommendation:** Review the Controlled Substance Reporting System for duplication of therapies or benzodiazepine use, and consider a non-opioid agent as first-line if at all possible. When opioids are needed, use the lowest possible dose for the shortest possible amount of time. Consider co-prescribing naloxone for patients at risk of opioid-induced respiratory depression, such as those taking opioids chronically or those with respiratory disorders. When de-prescribing, create an individualized tapering plan to help minimize symptoms of opioid withdrawal. As a starting point, the CDC recommends a decrease of 10% of the original dose, though some patients may require slower monthly tapers.

- **Benzodiazepines**

The number of benzodiazepine prescriptions filled increased by 67% between 1993 and 2013, (*https://www.madinamerica.com/2018/03/psychiatrists-warn-policymakers-benzodiazepine-overuse-lead-next-epidemic/*). With the opioid epidemic holding national attention, there has been little effort to address the inappropriate use and prescribing of benzodiazepines like alprazolam, clonazepam, and diazepam (N Engl J Med 2018; 378: 693-695.), though these agents carry a Black Box Warning against co-prescribing with opioids due to additive respiratory depression risk. According to the American Journal of Public Health, three quarters of deaths involving benzodiazepines also involve an opioid. When used short-term, benzodiazepines can certainly have clinical utility. But when they are continually used for extended periods of time, their risks can outweigh their benefits. Overuse of benzodiazepines can lead to confusion, worsened anxiety, persistent insomnia, and an increased risk of falls, especially in older adults (Beers Criteria [AGS 2015], N Engl J Med 2018; 378: 693-695.). Using benzodiazepines concomitantly with other central nervous system depressants such as opioids, skeletal muscle relaxants, antihistamines, antipsychotics, anticonvulsants, mirtazapine, trazodone, or alcohol increases these risks. Recommendation: Use the lowest effective dose for the shortest possible duration, if needed, as an adjunct to a first-line serotonergic agent when used to treat anxiety disorders. Review the Controlled Substance Reporting System for therapeutic duplications or opioid use. After chronic use, de-prescribing guidance recommends a gradual taper of 25% every 2 weeks, then 12.5% reductions near the end of the taper (Deprescribing.org).

- **Serotonergic Agents**

Serotonergic agents, most notably Selective Serotonin Reuptake Inhibitors (SSRIs) and Selective Norepinephrine Reuptake Inhibitors (SNRIs), increase and prolong serotonin concentration and time in the synaptic cleft. In 2010, more than 253.6 million prescriptions for antidepressants were filled, making it the second most prescribed medication class that year (*https://www.thebalance.com/the-most-prescribed-medications-by-drug-class-2663215*). One of the main factors driving the increase in scripts for antidepressants is the growing number of primary care physicians prescribing them, according to a study published in Health Affairs journal in August 2011. These agents are first-line for the treatment of depression and anxiety, and many have additional indications, but antidepressants are not the only medications that promote serotonergic activity. Several prescription, non-prescription, and natural medications can promote serotonergic activity, including tramadol, fentanyl, triptans, dextromethorphan, St. John's Wort, lithium, buspirone, amantadine, and levodopa. While concomitant use of these agents is not explicitly contraindicated, polypharmacy

[CONTINUED ON PAGE 16]

[Book Review continued from page 9]

action. This is the nearest thing to a modern day miracle.

The book looks into the future of artificial intelligence (AI) and its possibilities. The work of futurist Ray Kurzweil who received his PhD at MIT under Marvin Minsky, one of the founders of artificial intelligence, is cited. Dr. Kurzweil has predicted that by 2019, a $1000 PC will have the computing power of the human brain—twenty million billion calculations per second. He proposes that this number was not grabbed out of thin air. It is obtained by taking the one hundred billion neurons of the brain, multiplying one thousand connections per neuron, and two hundred calculations per second per connection.

As an aside, it might be useful to say a few words about the new age of connectomics. We have had genomics, proteomics, and now we have entered connectomics which is the field of study of connectomes, and production of comprehensive maps of connections within an organism's nervous system, typically of the brain. These maps are being developed and studied with enormous speed. Harvard biologist Jeff Lichtman has devised a contraption, connecting a giant electron microscope to Magnetic Resonant Imaging (MRI) and functional MRI (fMRI) taking pictures of the connections of the neurons in the brain. The number of connections is astounding. It is in the trillions. Now back to the prediction of futurist Ray Kurzweil:

By 2029, a $1000 PC will be a thousand times more powerful than the human brain and the work of futurist Kurzweil;
By 2055, $1000 of computing power will equal the processing power of all human brains on the planet.

What is most impressive, this book, Kaku's ninth which I call his *Ninth* Symphony, just like Beethoven's *Ninth*, gives the reader a sense of transcendence and elevation. Like Beethoven's *Ninth*, listening to the celestial voices of the Chorales singing *"Freude, Tochter of Elyzium, deine Zauber binden weider was die Mode stren geteilt; alle mencchen werden Bruder who dein sanfter weilt."* "Joy, daughter of Elysium, your magic again units all that custom harshly torn apart, all men become brothers beneath your gentle hovering wing", in Kaku's latest book, I felt like I was floating among myriads of angels of hope, comfort, promise and beauty. Who knows, Kaku might be related to Beethoven or maybe Dali Lama. Reading Kaku elevates Augustinian awareness of the gift of our brain, this 2.5 pounds of mystery given to us for free, a sheer act of grace. We must enjoy discovering our brains by learning more and more, the highest form of joy. The latest work of Michio Kaku *The Future of The Mind* is all music and no noise. I highly recommend it to readers of all ages.

**The writer is Adjunct Professor of Psychiatry, University of North Carolina School of Medicine at Chapel Hill, Distinguished Life fellow American Psychiatric Association, and Founding Editor and Editor-in-Chief, Wake County Physician Magazine(1995-2012). He received Raleigh Medal of Art in 2001, inducted to Raleigh Hall of Fame 2013, elected Lifetime Trustee, North Carolina Symphony in 2015, and 2016 recipient of NC Award, Fine Arts.*

[De-prescribing continued from page 14]

and risk for adverse events can result when a patient is prescribed multiple serotonergic agents, often by different prescribers, such as an SSRI prescribed by a psychiatrist for depression, an SNRI prescribed by a pain management clinic for neuropathic pain, and trazodone prescribed by a primary care provider for insomnia. Excessive serotonergic activity in the body can cause Serotonin Syndrome, which can be potentially fatal if not promptly identified and aggressively treated. **Recommendation:** Review patients' complete medication lists for therapeutic duplications and provide education on signs and symptoms of Serotonin Syndrome, especially if the patient is taking more than one serotonergic medication. Gradual tapering or cross-tapering may be needed when stopping or switching agents.

- **Anticholinergics**

Anticholinergic or antimuscarinic properties of certain drug classes pose risks, especially when two or more of these drugs are used concomitantly. Opposite to that of cholinergic medications and their SLUD (Salivation, Lacrimation, Urination, and Defecation) symptoms, anticholinergic medications can lead to symptoms such as increased body temperature, dry mouth, dry eyes, constipation, decreased sweat, flushed face, and delirium. Particularly in older adults, who commonly experience reduced kidney and liver function, these medications can increase the risk for falls. From a study conducted by the National Ambulatory Medical Care Survey, they found that from 2006-2015, approximately 6.2% of older adults who visited a physician were given a prescription for a high-risk anticholinergic. Drug classes with moderate to strong anticholinergic effects include: tricyclic antidepressants, antiemetics, first-generation antihistamines, anti-Parkinson's agents, first-generation antipsychotics, and antispasmodics. **Recommendation:** Although simultaneous use of drugs with anticholinergic effects is rarely contraindicated, it is important to monitor the patient and to observe for potential adverse drug reactions. Weigh the risks against the benefits of continued anticholinergic use, especially in geriatric patients.

Conclusions and Resources for Medication Optimization

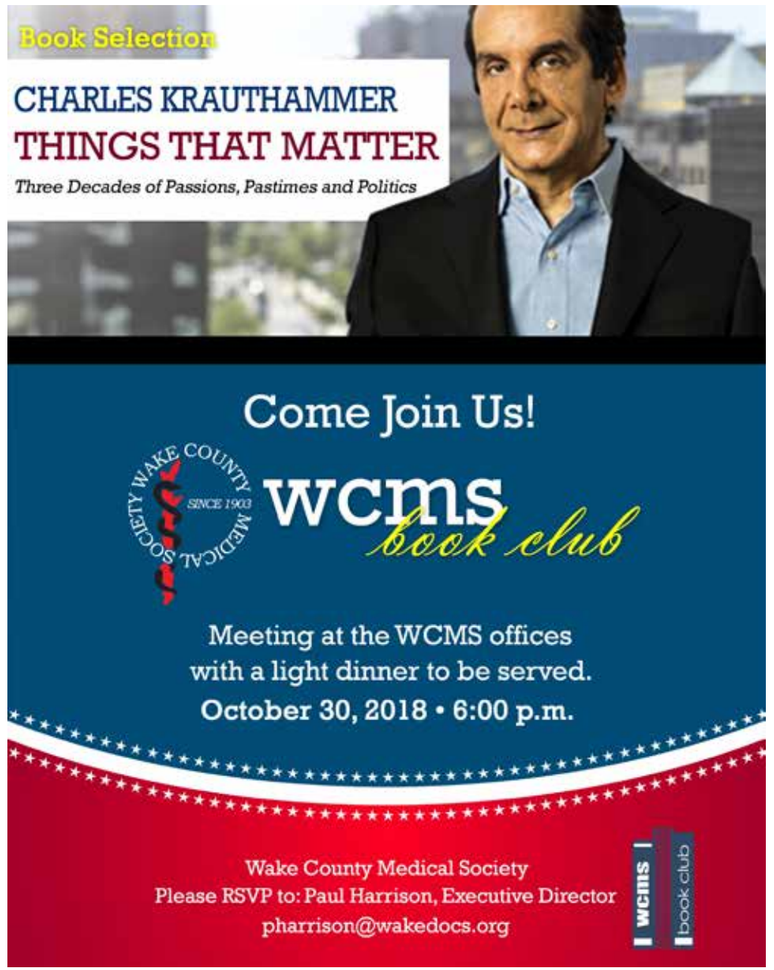
The most complex members managed by CCWJC are overwhelmed by a substantial medication burden. Appropriate use of chronic medications can decrease hospitalizations, readmissions, Emergency Department visits, and costs, but medication overuse can result in increased admissions and increased costs. The ultimate goal is to use the least number of medications at the lowest possible dose with the most infrequent dosing to treat the most conditions. Both research and anecdotal evidence suggest a plethora of missed opportunities to optimize medication lists by shortening them, but the best way to combat polypharmacy is to avoid it in the first place, as de-prescribing can often be challenging to patients who have become dependent on their medications after long-term use. Community Care Clinical Pharmacists work to recommend medication optimization strategies to providers for Carolina Access-II Medicaid recipients. Community pharmacists, particularly those who are part of the Community Pharmacy Enhanced Pharmacy Services Network (CPESN), are additional resources to help patients and providers optimize medication regimens and patient outcomes. A web-based application is available to assist in locating CPESN pharmacies within a geographic area (*https://cpesn.com/locator/#/pharmacies*). *Deprescribing.org*, a website developed collaboratively by a pharmacist and physician in Canada, contains evidence-based de-prescribing algorithms for five classes of medications and is another potential source of information. §

Community Care
OF NORTH CAROLINA
Community Care of Wake/Johnston Counties

The Wake County Medical Society Book Club Members enjoyed lively conversation as they discussed *The Great Influenza*, at their July 24th, 2018 Book Club Dinner Meeting.

Attendees included (left to right): Dale Oller, Derek Schroder, Bob Munt, Doug Holmes, Assad Meymandi, Bob Bilbro, Bob Johnson and Ted Kunstling. (Not pictured: John Perry and Paul Harrison)

Please come join us at our next Book Club & Dinner meeting on **October 30, 2018 at 6:00pm at the WCMS offices.** A light dinner will be served. We will be discussing Charles Krauthammer's book, ***Things That Matter*** *Three Decades of Passions, Pastimes and Politics.*



Wake County Physician Magazine (WCPM) is a publication for and by the members of the Wake County Medical Society. WCPM is a digital, quarterly publication published January, April, July, and October.

All submissions including ads, bio's, photo's and camera ready art work for the WCPM should be directed to:

Tina Frost
Graphic Editor WCPM
tina@tinafrost.com 919.671.3963

Photographs or illustrations:
Submit as high resolution 5" x 7" or 8" x 10" glossy prints or a digital JPEG or TIF file at 300 DPI no larger than 2" x 3" unless the artwork is for the cover. Please include names of individuals or subject matter for each image submitted.

Contributing author bio's and photo requirements:
Submit a recent 3" x 5" or 5" x 7" black and white or color photo (snapshots are suitable) along with your submission for publication or a digital JPEG or TIF file at 300 DPI no larger than 2" x 3". All photos will be returned to the author. Include a brief bio along with your practice name, specialty, special honors or any positions on boards, etc. Please limit the length of your bio to 3 or 4 lines.

Ad Rates and Specifications:
Full Page $800
1/2 Page $400
1/4 Page $200

WAKE COUNTY MEDICAL SOCIETY

Become a Member of Wake County Medical Society and help support the indigent care and community service programs of the Society.

CURRENT PROGRAMS

Project Access - A physician-led volunteer medical specialty service program for the poor, uninsured men, women, and children of Wake County.

Community Care of Wake and Johnston Counties CCWJC has created private and public partnerships to improve performance with disease management initiatives such as asthma and diabetes for ACCESS Medicaid recipients.

CapitalCare Collaborative - The CCC program is a membership of safety net providers working corroboratively to develop initiatives to improve the health of the region's medically underserved such as asthma and diabetes for Medicaid and Medicare recipients.

WHY JOIN

Membership in the Wake County Medical Society is one of the most important and effective ways for physicians, collectively, to be part of the solution to our many health care challenges.

A strong, vibrant Society will always have the ear of legislators because they respect the fact that doctors are uniquely qualified to help form health policies that work as intended.

It's heartening to know the vast majority of Wake County physicians, more than 700 to date, have chosen to become members of the Wake County Medical Society.

HOW TO JOIN

To become a member of the Wake County Medical Society contact Paul Harrison at pharrison@wakedocs.org or by phone at 919.923-2442

A portion of your dues supports to the volunteer and service programs of WCMS. Membership is also available for PA's. There is even an opportunity for your spouse to get involved by joining the Wake County Medical Society Alliance.

WCMS MISSION

To serve and represent the interests of our physicians; to promote the health of all people in Wake County; and to uphold the highest ethical practice of medicine.

BENEFITS OF MEMBERSHIP

Service Programs - The spirit of volunteerism is strong in Wake County. Hundreds of local physicians volunteer to help our indigent. The Society coordinates several programs that allow low income individuals access to volunteer doctors and to special case management services for children with diabetes, sickle cell anemia or asthma.

Publications - Members receive the peer-reviewed The Wake County Physician Magazine four times a year, and we keep you informed regularly via pertinent emails. The magazine focuses on local health care issues in Wake County, the Wake County Medical Society and the WCMS Alliance, a companion organization composed of physician spouses and significant others.

Socializing with your physician colleagues - Many physicians feel too busy to do anything except work long hours caring for patients. But, the WCMS provides an opportunity for physicians to nourish relationships through social interaction with one another at our dinner meetings featuring prominent speakers and at other events.

Finally, joining the WCMS is plain and simple the right thing to do - Physicians and the community benefit from our membership and our leadership in local affairs.

The Wake County Medical Society (WCMS) is a 501 (c) 6 nonprofit organization that serves the licensed physicians and physician assistants of Wake County. Chartered in 1903 by the North Carolina Medical Society.

ENJOY THE REWARDS OF BEING A MEMBER

JOIN TODAY!