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AUGUST/SEPTEMBER 2019 • COVERING THE I-4 CORRIDOR



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2019**  
COVERING THE I-4 CORRIDOR

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Dr. Steven Smith, AdventHealth Orlando's Chief Scientific Officer, sometimes wonders if he and his family members are carriers of the FH gene. Could FH or familial hypercholesterolemia have been responsible for his father's first cardiac bypass before the age of 50, his grandfather's sudden cardiac death at an early age or his own high cholesterol? Thanks to AdventHealth Orlando's WholeMe study, Dr. Smith and 10,000 others will be evaluated for genes that are linked to FH – a genetic condition that causes high cholesterol. If left untreated, FH can lead to a heart attack or cardiac event, even in young adults.

AdventHealth's groundbreaking WholeMe project, in partnership with Helix, a personal genomics company, is the first study of its kind in Florida. As project overseer, Dr. Smith hopes to "start a conversation about how we can use the science of genomics and genetic testing to improve our health. This type of testing goes beyond genetic and cultural history, focusing on the patient's 'whole health' and well-being, not just treating disease, but preventing it before it happens." WholeMe has several study goals, including empowering participants with potentially life-saving information about their heart health, as well as studying how they interact with study data once results are received.



PHOTO: DONALD RAUHOFFER / FLORIDA MD.

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I am pleased to bring you another issue of *Florida MD*. The emotional and physical trials and tribulations of parents and families with a child who is mentally and/or physical disabled. Where can they go and who can help them and their child? Since 1955 UCP of Central Florida has offered support, therapy and education for thousands of children with a wide range of disabilities. They continue to grow and provide much needed services. Please join me in supporting this wonderful organization.

Best regards,



Donald B. Rauhofer  
Publisher

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UCP of Central Florida is a not-for-profit charter school and pediatric therapy center providing support, education and therapy services for children, with and without disabilities, ages birth through 21. More than 3,000 children and their families receive services annually. There are seven campuses located throughout Central Florida in three counties – Orange, Osceola and Seminole.

The charter schools serve students of all abilities including children with cerebral palsy, Down syndrome, autism, spina bifida, speech delays, visual impairments and other developmental delays. UCP now embraces an inclusion education model allowing all children – with and without disabilities – to learn, grow and excel together in the same setting. Research illustrates that inclusion education strengthens socialization skills, test scores and acceptance of others for both students with and without special needs.

For more information, go to [www.ucpcf.org](http://www.ucpcf.org).

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# Is This Patient Crazy?

By John “Lucky” Meisenheimer, MD and John Meisenheimer, VII

A 37-year-old man shows up at the office and says, “Doc I’ve heard you are the best.” Always a red flag in my mind, but now I am prepared for the second inevitable statement. “I’ve been to five other doctors, and none were able to help me I hope you can.” The gauntlet has now been cast. I think to myself, well I am about to become the sixth doctor that is not going to be able to help, regardless, I put my best foot forward and proceed with the evaluation.

The patient explains he, for the last four months, has had a horribly itchy rash that can occur at any time. Often it happens after showering and many times when going to bed, but it can occur at any hour. It may start in one area and then spread to multiple sites. The itching is ruining his life. When asked to see the rash he replies it’s not there right now, matter of fact, it always seems to be gone when I visit a doctor. The doctors look at me like I’m crazy and they all order a lot of blood tests, which are normal. Then they tell me it’s probably stress related.

In delving into the treatment history, the first doctor was his family doctor who did order lab tests. The tests were routine blood work for his annual physical exam. The mystery rash was brought up during the exam, and the doctor recommended seeing a dermatologist. The patient didn’t want to pay another copay, so he consulted Dr. Web MD and then Dr. Google. After a thorough search, he determined it might be a symptom of cancer. So, he went to a walk-in clinic and saw the “doctor” there (a nurse practitioner) who told him it might be stress related and gave him some Benadryl. The next outbreak he took the Benadryl. The rash didn’t go away any faster, and 6 hours later he had another outbreak. He went to his pharmacist (who had her doctorate). She recommended a hydrocortisone cream and to see a dermatologist. The hydrocortisone cream didn’t work, and the patient is convinced that he needs a CAT scan.

**Dermatographism being demonstrated 2 minutes after stroking a patient’s shoulder in a tic tac toe pattern with a fingernail.**



PHOTO: JOHN MEISENHEIMER, VII

His skin exam appeared normal initially. There was no rash, as the patient had said. Until, after lightly scratching the skin with my fingernail within one to two minutes wheals began to appear, and the patient stated he is now very itchy where I scratched.

And as simple as that, the mystery diagnosis is now confirmed. Dermatographism.

Dermatographism is not an uncommon condition but is sometimes challenging to diagnosis unless a “stroke test” is performed. Historically, Circus sideshow performers with dermatographism were billed as “human chalkboards.” Crowds were delighted to see messages miraculously appear on the performer after lightly stroking the skin.

The underlying cause is unknown, but the mechanism is an abnormal release of histamine from mast cells in the skin following minor physical pressure/trauma. It can occur in association with urticaria but can be an entity of its own.

Treatment is relatively simple as most individuals respond to long-acting antihistamines such as Zyrtec, Xyzal, Claritin, and others. Taken on a regular daily basis, these antihistamines can block the dermatographism. Short-acting antihistamines can work but must be administered several times a day around the clock to prevent the outbreaks. The average duration of the condition is one to three years, but I have seen it persist in some for over 20 years. The condition leaves as mysteriously as it comes.

The patient is now happy to know that he doesn’t have cancer and now he has an exciting diagnosis he can easily share with unique photo posts on his Facebook page. He is somewhat disappointed the diagnosis did not require some hi-tech scan or lab test for confirmation and mentions that he shouldn’t have to do his copay because all I did was scratch him on the back and recommend antihistamines he can buy over the counter. I explained that the scratch on the back was free, knowing that I needed to scratch him on the back was why he still had to do his copay.

*Lucky Meisenheimer, M.D. is a board-certified dermatologist specializing in Mohs Surgery. He is the director of the Meisenheimer Clinic - Dermatology and Mohs Surgery. John Meisenheimer, VII is a medical student at USF. ■*



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# AdventHealth's Groundbreaking WholeMe Project

By Pamela Ruben

Dr. Steven Smith, AdventHealth Orlando's Chief Scientific Officer, sometimes wonders if he and his family members are carriers of the FH gene. Could FH or familial hypercholesterolemia have been responsible for his father's first cardiac bypass before the age of 50, his grandfather's sudden cardiac death at an early age or his own high cholesterol? Thanks to AdventHealth Orlando's WholeMe study, Dr. Smith and 10,000 others will be evaluated for genes that are linked to FH – a genetic condition that causes high cholesterol. If left untreated, FH can lead to a heart attack or cardiac event, even in young adults.

AdventHealth's groundbreaking WholeMe project, in partnership with Helix, a personal genomics company, is the first study of its kind in Florida. As project overseer, Dr. Smith hopes to “start a conversation about how we can use the science of genomics and genetic testing to improve our health. This type of testing goes beyond genetic and cultural history, focusing on the patient's ‘whole health’ and well-being, not just treating disease, but preventing it before it happens.” WholeMe has several study goals, including empowering participants with potentially life-saving information about their heart health, as well as studying how they interact with study data once results are received.

Participants with FH will be provided counseling and a treat-

ment pathway. “From a genetic screening standpoint, FH is a life-threatening genetic condition associated with high cholesterol and premature heart attacks. FH requires more aggressive treatment and is more serious than having diet-driven high cholesterol,” comments Dr. Wes Walker, Associate Chief Medical Information Officer of AdventHealth Orlando. Dr. Walker also heads AdventHealth's Genomics and Personalized Health program.

“One reason our study is so important is that 90% of the people diagnosed with FH didn't know they had it until they experienced an event, like a heart attack.” Dr. Walker continued, “FH is ideal for study, as it is a condition that is treatable through the right medications as well as lifestyle changes. Knowing about the condition in advance can save and change lives. FH is hereditary and may be shared with first-degree family members. Fifty percent of those who have it will pass it on to their children; at the pediatric level, physicians are screening kids and teens so prevention can begin at an early age”.

Like the 9,999 other WholeMe participants, Dr. Smith will enroll for the study online at [WholeMeFlorida.com](http://WholeMeFlorida.com). After registering, Dr. Smith will receive an appointment time at one of the locations for the study. Dr. Rebecca Essner, Ph.D., the Principal

Investigator of the WholeMe study, shares that participation is free, with appointments available six days a week to anyone residing in the state of Florida over the age of 18. For the convenience of participants, appointments will be available in the evening as well as during the day. Results will be provided in 4 to 8 weeks.

When applicants arrive at their appointment, they will receive a health questionnaire, learn about the study's privacy policies and review and sign HIPAA forms. Finally, they will provide their saliva in a testing tube for a DNA sample. “We follow disclosure and testing protocols, making sure study members understand what they are signing up for. We take informed consent very seriously,” comments Essner.

Those who are concerned with privacy policies and/or health insurance discrimination are informed of the protections by the Genetic Information Nondiscrimination Act (GINA), a federal law that generally makes it illegal for health insurance companies and most employers to discriminate due to genetic information. For those with questions or concerns, the study's privacy policies are outlined in the Frequently Asked Questions section on the WholeMe website.

**Dr. Walker and Dr. Essner at the kit registration station at the Orlando WholeMe enrollment center.**

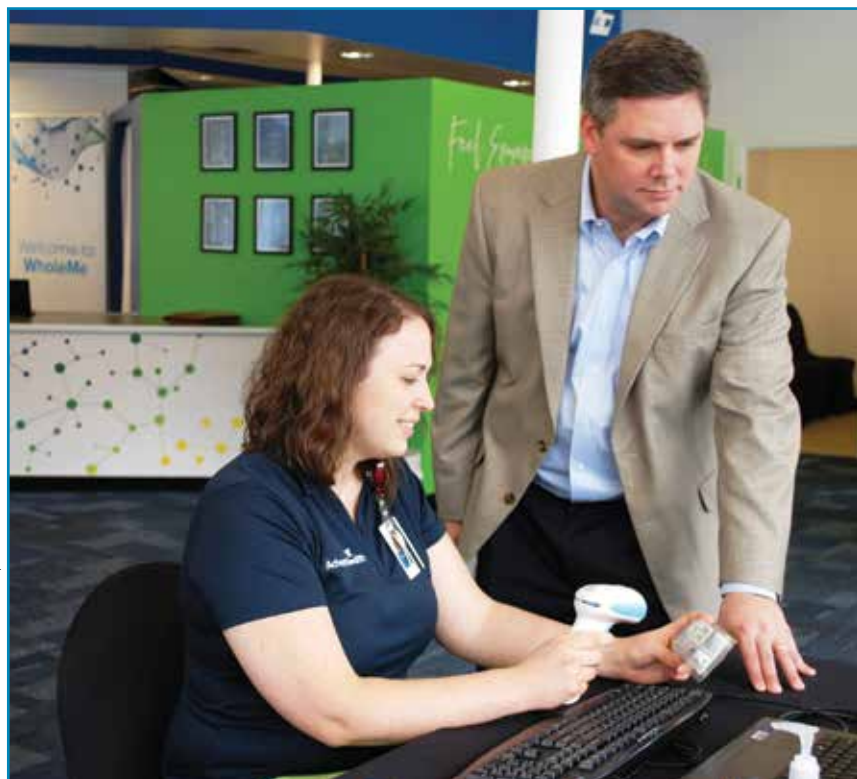


PHOTO: DONALD RAUHOFFER / FLORIDA MD

Study participants that carry the FH gene will be notified and given a confirmatory blood test. Once findings are confirmed, they will be provided with genetic counseling and follow-up care options. They are also welcome to consult with their own doctors and care teams regarding their results. All participants will learn about certain personal traits, such as lactose tolerance, caffeine metabolism, and whether or not they are genetically predisposed to having a sweet-tooth. Dr. Essner shares that enrollees will also find out about their ancestral traits and 22 other personal genetic markers. Learning about selected aspects of their genetics will help participants learn more about their whole selves.

FH gene carriers will be provided an opportunity for a virtual meeting with a genetic counselor and connected with a cardiologist to discuss treatment options. The genetic counselor will explain, in terms of health, the meaning of the diagnosis, and how it may impact family members. Additionally, a results summary will be provided that the participant can share with their immediate family members. Essner comments, “This way, the participant can share facts and health risks with anyone else who might be affected.”

To leverage their newfound knowledge, “participants who don’t carry the FH gene will have access to a care navigator, who will help guide them down an integrated health path,” comments Essner. The participant may return to their primary care provider to ask questions or may discuss ways to improve their health with their care navigator. “Perhaps participation in the study will motivate them to quit smoking or give themselves the push they needed to make other lifestyle changes.”

“This study is a great place to offer the community an introduction into the area of genomics. This goes beyond consumer-purchased DNA tests, and enters not only into cultural history, but initiates a journey into health and well-being,” remarked Dr. Smith.

“Those first-generation tests made consumers comfortable with the concept of gene studies, but there is so much more we can do.” Dr. Smith points out that while direct-to-consumer genetic health testing is now available, participating consumers receive pages and pages of data with no data interpretation. These dense reports, full of uninterpreted and potentially concerning medical information, create anxiety, and send worried patients to their primary doctors.

“Whole Me offers a different kind of genomic testing, taking results, and making them actionable by offering a medical conduit. We are transforming the medical community by being proactive and preventative. We are making complexities easier and more digestible for the busy clinician. Our goal is to provide insights for the prevention, diagnosis, and treatment of disease.



Participant enrolling at the Orlando WholeMe enrollment center.



Participants who come to enroll in the study leave a saliva sample in the collection tube shown above.

We don’t want to just give results, but help create a pathway for the next steps and treatment of the whole patient”.

Dr. Walker concurs with his colleague, Dr. Smith. He reemphasizes that genomics and personalized health are the wave of the future. “This field is moving faster than Moore’s law, which set the pace for advancements in computing power. We will continue to have better data sets with lower costs. This data will be put into drug technology, diagnosis, and treatment enhancement.” Walker is quick to point out that data science benefits both the doctor and the patient. “Computing power and data science tools will allow us to pull insights out of enormous amounts of data. Rather than bogging down the medical field, we will provide information at the point of care so clinicians can

PHOTO: DONALD RAUHOFFER / FLORIDA MD



make evidence-based decisions in partnership with their patients.”

*Florida residents over the age of 18 are welcome to enroll. For a full list of inclusion criteria or to learn more about WholeMe, visit [WholeMeFlorida.com](http://WholeMeFlorida.com).* ■

Dr. Steven Smith at the WholeMe Preview event with leaders from AdventHealth Orlando on June 19, 2019.



The official WholeMe launch event on July 24, 2019. From left to right: James Lu, co-founder and senior vice president at Helix; Robert Herzog, vice president of research operations at AdventHealth; Oriana Cardin, Community Impact Director at American Heart Association; Daryl Tol, president and CEO of AdventHealth's Central Florida Division; Jerry Demings, Orange County Mayor; LaSonia Landry, vice president at American Heart Association; Dr. Patricia Guerrero, cardiologist at AdventHealth; Dr. Wes Walker, medical director of the Genomics and Personalized Health program at AdventHealth Orlando.



PHOTO PROVIDED BY ADVENTHEALTH



# Cannabinoids may help protect against Alzheimer's Disease

By Michael Patterson, NHA, OTR/L, CEAS



A study published in the Journal of Nature: Mechanisms of Disease, discovered that the human endocannabinoid system helps eliminate the amyloid-B protein within the brain cells. With the use of a cannabinoid found in cannabis (tetrahydrocannabinol- THC), inflammation decreased within the brain and prevented cell death.

David Schubert of the Salk Institute for Biological Studies and his team of researchers used a tissue culture model to study the effects of the amyloid-B protein and other protein aggregates within the brain cells. One of the most common signs of Alzheimer's disease is the accumulation of clumps of amyloid-B protein within the brain cells. This buildup of amyloid-B causes an inflammatory response within the brain cells leading to death of neurons within the brain. This neuronal death leads to the typical symptoms of Alzheimer's disease which include decreased memory, decreased bodily functions and motor skills, and eventual death.

The human endocannabinoid system works to keep the body in a homeostatic state. From the study, researchers discovered that the body's endocannabinoid system can be stimulated with cannabinoids found in cannabis, specifically the cannabinoid THC. Most people know that THC is the "stuff in marijuana that gets you high". However, with the introduction of THC into the tissue culture, it was discovered that THC eliminated the Amyloid-B within the brain cells, decreased inflammation, and prevented death of brain cells.

The study did not mention the dosage of THC to prevent the death of brain cells, but we do know that there has never been a lethal dose of cannabis or THC in a human in recorded history. As of today, there is no cure for Alzheimer's Disease and no FDA approved pharmaceutical treatment that has demonstrated a substantial decrease in Amyloid-B within the brain. In the very near future, low-dose daily cannabis use could be widely considered as a preventative measure from being affected by Alzheimer's Disease later in life. The entire study can be found here: <https://www.nature.com/articles/npjamd201612#f1>.

*Michael Patterson NHA, OTR/L, CEAS is CEO of US Cannabis Pharmaceutical Research and Development LLC. ([uscprd.com](http://uscprd.com)). Mr. Patterson is a healthcare executive with over 25 years experience in the following areas: Cannabis-Hemp investment, Law, Regulation, Compliance, Operations, and Management, Skilled Nursing, Pharmacy, Laboratory, Assisted Living, Home Healthcare, and Healthcare Analytics. Michael is a subject matter expert in the Global Cannabis and Hemp Industry with Gerson Lehrman Group ([glg.it](http://glg.it)) and Guidepoint. Mr. Patterson is an editorial board member of the American Journal of Medical Cannabis, licensed Nursing Home Administrator, and licensed Occupational Therapist in 4 states. ■*



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# Future Perspectives for Muscle Adaptation and Rehabilitation Using Venous Blood Flow Restriction

By Ethan Hill



The ramifications of losing muscle strength and mass as a result of aging, injury, surgery, or immobilization have been well documented, and if left untreated can lead to a variety of diseases including sarcopenia, osteoporosis, cancer, diabetes, and increased risk of fall. What is less clear and often less practical are the interventions implemented to regain, maintain, or increase muscle strength and mass. Specifically, it is commonly thought that increases in muscle strength or

mass can only be achieved through rigorous weightlifting techniques that require lifting heavy loads generating large amounts of mechanical stress onto the body. This method of training, although effective, has limited applicability to the general public and even less, following injury, surgery, or in individuals with acute or chronic joint and/or muscle

pain. Herein, I will briefly discuss the mechanisms that mediate changes in muscle strength and mass and highlight an alternative form of training that is capable of eliciting increases in muscle strength and mass without the use of heavy loads or rigorous training.

## REGULATION OF MUSCLE STRENGTH AND MASS

It is generally accepted that increasing muscle mass (a process referred to as muscle hypertrophy) is a primary mechanism for increasing muscle strength [1, 2]. Muscle hypertrophy occurs in response to mechanical tension and/or metabolic stress that affect rates of muscle protein synthesis, muscle protein breakdown, and myogenic satellite cell activity [3]. Typically, resistance training interventions utilize heavy training loads that exert high mechanical tension to increase muscle strength and mass. This approach was consistent with previous recommendations of the National Strength and Conditioning Association and the American College of Sports Medicine that have suggested resistance training with heavy loads (60-80% of maximum strength) was necessary to achieve increases in muscle strength and elicit muscle hypertrophy. This method of training, however, is not well tolerated by all populations or practical for individuals undergoing treatment, during post-surgery or injury, or for older adults. Therefore, we are exploring alternative interventions that rely predominately on changes in metabolic stress as a mechanism to increase muscle strength and mass without the need for heavy training loads.

### ELICITING MUSCLE HYPERTROPHY

- Mediators of muscle hypertrophy: muscle protein synthesis, muscle protein breakdown, myogenic satellite cell activity
- Stimulators of muscle hypertrophy: mechanical tension and/or metabolic stress

### APPLYING VENOUS BLOOD FLOW RESTRICTION TO ENHANCE MUSCLE ADAPTATION



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An intriguing alternative to traditional resistance training is venous blood flow restriction (vBFR). The application of vBFR involves a restrictive device (similar in concept to a pneumatic cuff) that is placed on the proximal segment of a limb, most often on the arm or leg (Figure 1). The cuff is progressively inflated until the pressure is sufficient to stop the flow of venous blood out of the limb, while arterial blood flow to the limb remains relatively unaffected. To ensure the adequate response is achieved this process is coupled with doppler ultrasound, although other techniques have been validated. As a result of vBFR, there is a swelling response within the muscle and internal milieu of the muscle changes rapidly, particularly during exercise, as metabolites from energy expenditure are “trapped”. These local responses (i.e. metabolic stress) within the muscle may contribute to the robust adaptations observed as a result of vBFR [4, 5]. Specifically, unlike traditional resistance training approaches that necessitate the use of heavy loads, vBFR can be combined with loads corresponding to 30% or less of maximum strength to elicit increases in muscle strength and mass. For example, we previously demonstrated that 4-wks of vBFR using a load that corresponded to 30% of maximum strength resulted in 31.2% to 35.0% increases in muscle strength and increases of 9.1% to 26.0% in muscle size [6, 7]. Moreover, the subjects were asked to provide feedback of how difficult they perceived the training and, in general, the responses were either “fairly light” or “somewhat hard”. Thus, vBFR may serve as an alternative training modality among populations where high mechanical stress, like that of traditional resistance training approaches, is not well tolerated.

#### VBFR AS AN ADJUNCT TO RESISTANCE TRAINING

- Frequency: 2-3 days per week
- Sets and repetitions: 75 repetitions performed over 4 sets (1×30, 3×15)
- Load: 30% of maximum strength
- Rest: 30 s of rest between sets (cuff remains pressurized during rest periods)
- Duration: approximately 5 minutes per exercise

#### AUGMENTING REHABILITATION WITH VBFR

vBFR may also improve current rehabilitation strategies. For example, our preliminary findings indicated that the application of vBFR alone (without exercise) increased muscle strength over a 4-wk period albeit to a lesser extent than the exercise conditions [8]. Furthermore, others [9-12] have demonstrated that vBFR attenuated losses in muscle strength and mass during limb immobilization, following surgery, and for individuals in an intensive care unit. Current rehabilitation practices, however, utilize predominantly concentric-based exercises (muscle shortening under tension), largely due to misconceptions that eccentric-based exercise (muscle lengthening under tension) induces delayed onset muscle soreness [13, 14]. For example, we recently examined the effects of eccentric- and concentric-based vBFR resistance training and our preliminary findings indicated that neither condition resulted in delayed onset muscle soreness. Additionally, compared to typical concentric-based rehabilitation techniques, eccentric-based rehabilitation was superior at restoring muscle strength and neural function following injury [13, 14]. In our own experiment, preliminary findings indicated that 4-wks of vBFR combined with eccentric-based training increased muscle strength and muscle activation in the untrained limb, a phenomenon referred to as cross education. The vBFR concentric-based

condition that we implemented had no effects on the untrained limb for muscle strength or muscle activation. Together, it is possible that eccentric-based exercise combined with vBFR may improve muscle adaptation and rehabilitation practices.

#### VBFR AND ECCENTRIC-BASED REHABILITATION

- vBFR may attenuate losses in strength and mass during immobilization
- Eccentric-based exercise improves neuromuscular function following injury
- vBFR combined with eccentric-based exercise may enhance rehabilitation

#### FUTURE CONSIDERATIONS

Currently, we are investigating the neural mechanisms that underly muscle adaptation as a result of vBFR. We are also examining the application of vBFR in a variety of settings to elicit muscle adaptation, attenuate delayed onset muscle soreness, and augment rehabilitation techniques. There is a need for collaborative work in this regard to further decompose the mechanisms mediating muscle adaptation as a result of vBFR. Additionally, we are looking to implement vBFR in a variety of rehabilitation settings to further understand the time-course of changes in muscle strength and mass in order to determine the most effective and efficient application of vBFR during these time periods. *References available upon request.*

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An example setup of venous blood flow restriction (vBFR) applied to the upper portion of the arm. In this illustration, vBFR was applied during reciprocal forearm flexion-extension exercise performed on an isokinetic dynamometer. Also pictured on the arm are surface electrodes and accelerometers that were used to determine the motor unit activation strategies associated with force production. Not pictured is the ultrasound imaging device that was used to determine the restrictive pressure required to stop the flow of venous blood out of the arm, while arterial blood flow remained unaffected.



# Anatomy of a Florida Department of Health Complaint

By David Doyle and Julie Tyk



Department of Health (Department) Complaints are common and originate from a wide variety of sources. Complaints come from patients, family members, Notices of Intent in medical malpractice claims and Code 15 Reports hospitals are required to submit to the Department.

Typically, a physician receives a letter from the Department including a copy of the complaint. The physician has 45 days to submit a written response to the complaint. Upon receipt of the letter, a physician should contact their professional liability carrier as insurance policies often provide coverage for administrative actions. Under no circumstances should a physician submit a response to the Department or speak with its investigator without seeking legal advice.

A physician, with the assistance of counsel, should submit a written response to the complaint. This initial response, if done properly and thoroughly, is the physician's best chance to, in the immortal words of Deputy Barney Fife, "nip it in the bud." The response should provide all relevant information and records for the Department in an easily understandable manner since investigators usually have no medical training. Counsel can also submit a summary of the physician's defense, as well as an expert affidavit in support of the physician's treatment.

During the investigation, the investigator may request an interview. Physicians under investigation are not required to submit to an interview. However, if a physician agrees to an interview, he should only do so with counsel present.

Once the initial investigation is complete, the investigator prepares a report for The Probable Cause Panel (the Panel). The Panel reviews the investigator's report and any information the physician submitted to determine if probable cause exists that the physician violated any Florida Statute or rules.

If the Panel finds no probable cause, the case is dismissed, and the matter is not a public record. The Panel may also elect to issue a Letter of Guidance, which is neither public record nor considered formal discipline. The case will be dismissed after the Letter of Guidance is issued.

If the Panel finds probable cause, a formal Administrative Complaint is prepared by the Department. The Administrative Complaint outlines the charges against the physician. A physician typically has three options: 1) dispute the charges and request a formal hearing; 2) stipulate to the Department's proposed settlement; or 3) attempt to negotiate a settlement with the Department's attorney.

If a physician elects a formal administrative hearing, an administrative judge will hear the case. Both sides can call witnesses, experts and submit evidence. The judge will prepare a written decision called a recommended order. The order is submitted to the Board of Medicine where a final order is entered. The final order may be appealed.

*A Department Complaint can have far reaching implications on a physician's medical license. The Health Care Practice Group at Pearson Doyle Mohre & Pastis, LLP are committed to assisting Clients in navigating and defending Department Complaints. For more information and assistance, please contact David Doyle and Julie Tyk at Pearson Doyle Mohre & Pastis, LLP.*

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# Proton Therapy with the Integration of a Mobile CT

By Naren Ramakrishna, MD, PhD



Proton therapy is an advanced form of radiation therapy that uses proton beams rather than X-rays to treat selected tumors in adult and pediatric patients. Because it precisely targets tumors while reducing the dosage of radiation to adjacent organs, proton therapy potentially can limit side effects in all patients and decrease the effects on growth in pediatric patients.

The MEVION S250™ proton therapy system, currently in use at The Marjorie and Leonard Williams Center for Proton Therapy at Orlando Health UF Health Cancer Center, is based on unique core technology. Unlike other systems, Mevion's proton therapy systems have been engineered to eliminate the complexity of large accelerators and long beam transport lines. Mevion has designed the world's only gantry-mounted superconducting proton accelerator. Powered by the TriNiobium Core™, this revolutionary proton accelerator is only 6 feet (1.8 meters) in diameter but can generate 250 MeV protons capable of reaching targets as deep as 32 centimeters.

In January 2018, Orlando Health took a major step in the evolution of their proton therapy center, becoming the first to combine a compact proton therapy system with advanced mobile CT (computed tomography) imaging. By pairing a diagnostic quality CT scanner inside the treatment room with the state-of-the-art technology of the MEVION S250, physicians are able to efficiently monitor a patient's tumor response under treatment. This treatment combination provides additional visibility, flexibility, predictability and adaptability demanded by advanced proton therapy.

"In-room diagnostic CT imaging for positioning and treatment adaptation is paramount to ensure the most accurate treatment localization with protons," says Dr. Ramakrishna, MD, PhD, director of proton therapy for Orlando Health UF Health Cancer Center.

With mobile in-room CT technology, the CT image is acquired at the beginning of the radiation session and is processed and analyzed the same day. This process is repeated multiple times throughout the course of radiation treatment, which is typically several weeks. These images help clinicians to adapt the radiation delivery to better target certain types of tumors that constantly change or show noticeable response to radiation through the course of treatment. In certain cases, it is used to enhance the targeting of the tumor by providing a high-quality 3D image in the room for accurate tumor localization.

"This is a major advancement in how we can precisely position patients for proton therapy compared to conventional imaging methods," explains Omar Zeidan, PhD, chief of proton therapy physics at Orlando Health. "This CT-based IGRT system offers superior, high-resolution 3D imaging for accurate patient positioning."

Since the commissioning of the mobile CT scanner at Orlando Health UF Health Cancer Center, more than 120 patients have benefited from its unique imaging capabilities. Patients who benefit from this technology are those whose tumors are expected to change during their radiation course so that treatment can be adapted accordingly. Because some tumors do not change under

treatment or their response to radiation is manifested much later after radiation treatment course is completed, CT integration is applied based on clinical need.

The Marjorie and Leonard Williams Center for Proton Therapy at Orlando Health UF Health Cancer Center continues to be the only facility in the region to offer this unique treatment combination. The proton therapy team has published two peer-reviewed clinical articles based on their experience with this system and its positive impact on patient care. "The Mobius AIRO mobile CT for image-guided proton therapy: Characterization & commissioning" (*Journal of Applied Medical Physics* April 2017), involved evaluating various image quality, localization accuracy and dosimetric metrics of the Mobius AIRO Mobile CT System and comparing them to other common modalities. Findings showed that the AIRO system could be applied clinically for safe and accurate image-guided proton therapy. "Commissioning an in-room mobile CT for adaptive proton therapy with a compact proton system" (*Journal of Applied Medical Physics* April 2018), described the commissioning of AIRO mobile CT system for adaptive proton therapy on a compact double scattering proton therapy system.

Since first opening its doors in April 2016, The Marjorie and Leonard Williams Center for Proton Therapy has enjoyed strong growth, drawing a wide range of adult and pediatric patients throughout Florida, and from as far as the Middle East, Canada and Asia. The proton center treats a diverse group of patients with cancers of the brain, spine, prostate, breast, thorax and lungs, head and neck, as well as a large group of pediatric patients. Treatments have involved a wide range of clinical protocols and enrolled patients in a multi-institutional proton treatment registry. In July 2019, the center reached a major milestone, celebrating the 500th patient to receive proton therapy treatment.

The development of proton therapy with the integration of mobile CT has furthered Orlando Health's history as a pioneer in the use of state-of-the-art image-guided radiation therapy (IGRT). As the program moves forward, there is great excitement regarding future plans for growth. Clinical expansion is on the horizon and new technologies, like next-generation intensity modulated proton therapy (IMPT), will further enhance benefits and open treatment options for an even broader range of cancer patients from Florida and beyond.

**Naren Ramakrishna, MD, PhD, is director of proton therapy for Orlando Health UF Health Cancer Center. Dr. Ramakrishna received his medical degree through the Medical Scientist Training Program at Cornell University's Weill Cornell Medical College. He completed a residency in radiation oncology at The Johns Hopkins Hospital. Dr. Ramakrishna also earned a doctorate in cell biology and genetics from the Weill Cornell Graduate School of Medical Sciences and completed a Koch Research Fellowship in gene therapy.** ■

# Disease Prevention Begins with a Strong Immune System

By Joseph Cannizzaro, MD



As children return to school, we're reminded that exposure to more germs and hectic schedules can create an environment where colds and flus can gain a foothold and proceed to take down an entire household!

As a classically trained primary care physician who routinely blends conventional and complementary medicine in my pediatric practice, I like to use the term, "upstream medicine," which means we 1) trace symptoms of a disease back to common and basic metabolic roots and 2) learn to anticipate damage or dysfunction long before actual disease symptoms manifest.

Because of its significant role, the immune system is the first logical area of focus for disease prevention. Strengthening the immune system is one of the most important ways to ensure the health of the whole body.

## STRENGTHENING IMMUNE SYSTEM FUNCTION

There's no question that exercise, stress management and nutritional status play important roles in maintaining a healthy immune system. Poor nutrition causes a decline in immune function and increases susceptibility to infection. Specific nutrients play important roles in supporting immune system balance. A deficiency of any of these nutrients can adversely influence the function of protective T cells and B cells in the immune system: zinc, omega-3 fatty acids, vitamin A, B vitamins (especially folic acid), iron, copper, amino acids L-lysine and L-arginine, vitamin C and vitamin E. Correct choices of supplements—vitamins, minerals, fatty acids, probiotics, and botanicals—have been shown to boost immunity and reduce the risk of disease.

Psychological health influences the immune system and the course of many diseases. Depression, stress and anxiety increase production of pro-inflammatory chemicals in the blood, which can compromise or suppress the immune system. High levels of anxiety are associated with decreased immune function. You can see how school or work pressures combined with a less-than-nutritious diet can wreak havoc with immune system health.

## SALT THERAPY FOR ENHANCED IMMUNE HEALTH

In January 2018, our pediatric center became the newest location for The Salt Room® in Central Florida. Salt therapy is performed in this special spa-like room with salt-coated walls and floor, called a halochamber. Pharmaceutical-grade salt is pulverized into microscopic particles and pushed into the room by a halogenerator.

Salt treatment involves lounging in this cozy room and passively breathing in the particles while listening to soothing music, reading or just relaxing in a zero-gravity chair. Toys are provided so children can play with the salt in the room, much like sand at the beach.

The salt particles enter the lungs and nasal passages, accelerating mucus clearance and improving lung function while killing harmful bacteria and soothing the respiratory system. This 100% drug-free treatment is effective and has no side-effects. It

may also increase the effectiveness of conventional treatment by cleansing the airways and decreasing inflammation, which helps medications work more effectively and also reduces the need for them. Salt therapy is completely safe for everyone—from babies to geriatric patients—and helps prevent ear and sinus infections.

Salt therapy also has a relaxing effect on the nervous system and promotes an overall feeling of wellbeing, which may explain how it helps decrease the inflammatory response of the body and the flare-ups of respiratory and skin conditions. During cold and flu season, our team members will often take breaks in our salt room, especially if they feel a cold coming on.

## SUPPLEMENTS THAT SUPPORT A HEALTHY IMMUNE SYSTEM

There are several supplements, herbs, and foods that provide the nutrition needed to bolster the immune system. Be sure to get proper testing and an evaluation before taking any vitamins, herbs or supplements. Every person is an individual and must be treated that way. Taking supplements that aren't needed wastes money, could be dangerous, and only prolongs the time to arrive at a correct diagnosis and treatment regimen.

**Vitamin D:** People with higher vitamin D levels contract fewer colds, flu and other viral infections.

**Glutathione boosters:** Glutathione is produced by the liver and is the most important free radical scavenger and a major antioxidant. Low levels of glutathione are linked to many diseases. Glutathione precursors may be used by the body to increase glutathione production. Glutathione precursors include: Glutamine, S-Adenosyl-L-Methionine (SAME), N-acetylcysteine (NAC), vitamin E, and vitamin C.

**Antioxidants:** Because of their ability to scavenge free radicals, antioxidants are important immune system boosters. Supplementation with antioxidants like vitamins C, E and the Bs improve immune function. Supplementation with vitamin A stimulates immune responses, increasing antibody levels.

**B vitamins:** These vitamins have considerable influence on immune function. Vitamins B12 and B6 are cofactors in the creation of cysteine, a key component in glutathione synthesis.

**Lipoic acid:** Lipoic acid is a potent antioxidant with immune-boosting qualities. It regenerates other antioxidants like vitamins C and E and raises glutathione levels.

**Coenzyme Q10 (CoQ10):** Synthesized from the amino acid tyrosine, CoQ10 is an essential cofactor in the production of ATP, which is the body's primary source of energy. CoQ10 is a powerful antioxidant and scavenger of free radicals, it inhibits lipid peroxidation (oxidation of fats in cell membranes, which causes cell damage), and works synergistically with vitamin E. It has an important role in the stimulation of the immune system.



**Whey protein:** This food has potent antioxidant activity due to its high concentration of glutamate and cysteine, which are precursors to glutathione. It contains several substances that enhance the immune system, including the following: beta lactoglobulin (modulates lymphatic response), alpha lactalbumin (directly affects B and T lymphocytes and has the ability to reduce oxidative stress), lactoferrin (acts as an antioxidant, inhibits bacterial passage through the intestinal wall, and activates natural killer cells).

**Minerals:** Copper, zinc, and selenium influence the activity of antioxidant enzymes and reduce oxidative stress. Deficiencies of these minerals have been linked to weak immunity and infection.

**DHEA:** A hormone that has immune-enhancing effects. Low DHEA levels are associated with decreased production of IL-2 (a protein that stimulates white blood cells) and increased production of IL-6 (a protein that causes inflammation).

**Polyunsaturated fatty acids (omega-3s):** Omega-3s have been shown to counteract the suppression of the cellular immune system, suppress TNF alpha production (a cell signaling protein that causes inflammation), and they have an overall anti-inflammatory effect.

**Probiotics:** The gastrointestinal tract relies on live bacteria (microflora) to help support a robust immune response. Probiotics prevent foreign bacteria and allergens from passing through the intestinal wall and have an important role for the overall health of the intestinal immune system.

**Grapeseed Extract** and **Green Tea Extract** have immune-boosting properties and increase the activity of antioxidants like glutathione. They increase the power of natural killer cells, enhance the production of IL-2 for healthy white blood cells, and decrease production of IL-6, which is inflammatory. One of the most important catechins (naturally-occurring compounds) in green tea is epigallocatechin-3-gallate (EGCG).

In addition, plants and plant foods like blueberries, cranberries, garlic, and pomegranate contain active substances that keep the immune system working well. Echinacea and andrographis are herbs that have immune-enhancing and anti-microbial properties.

*Joseph Cannizzaro, MD has been practicing pediatrics in Central Florida for over 40 years and is dedicated to providing children and their families with healthier, happier and longer lives. As a classically-trained primary care physician who practices functional integrative medicine, Dr. Cannizzaro believes that integrative medicine can bring conventional and complementary healing modalities together, creating a highly personalized and high-touch healing environment. Call the Cannizzaro Integrative Pediatric Center at 321-280-5867 for a meet and greet or to book a session at The Salt Room® Longwood.*



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**Physicians:**



AdventHealth Orlando is accredited by the Florida Medical Association to provide Continuing Medical Education for physicians.

AdventHealth Orlando designates this live activity for a maximum of **9 AMA PRA Category 1 Credit(s)™** and Sunday, Breakout session **1.0 AMA PRA Category 1 Credit(s)™**. Physicians should claim only the credit commensurate with the extent of their participation in this activity.

**Nurses:**  
Up to **1.5 Nursing Continuing Education Credit Hours** have been applied for Saturday, August 24th and **5.5 Nursing Continuing Education Credit Hours** have been applied for Sunday, August 25th through the Florida State Board of Nursing Provider Number NCE2012/CEBroker Provider Number #50-724.

# Drug Shortages and the Upcoming Influenza Season

By Sam Pratt, RPh, FIACP & Juan Lopez, PharmD, FIACP

Have you ever walked into your local pharmacy to pick up a medication that you desperately needed only to find they were out of stock?

There have been a growing number of drug shortages and discontinuations in recent years, causing concern for both patients

and physicians alike. Medications may be commercially unavailable for a variety of reasons, including problems due to the manufacturing process, inadequate supply of raw materials, facility limitations due to safety and sterility concerns, discontinuation of a drug due to



decreased usage or declining manufacturer profits, or the introduction of a newer drug. Sometimes only certain doses and dosage forms of a particular drug, or specific combinations are discontinued. Regardless of how these drug shortages occur, the reality is that this situation leaves many people without access to the medication they require.

Drug shortages can have serious implications for patient care including the delay of medical procedures, therapeutic substitutions with second or third choice therapies which may be less clinically effective, or relying on therapies that have an increased risk for patient side effects. The University of Utah Drug Information Service reports that the rate of new shortages is increasing with long-term shortages not resolving. The most basic products required for patient care are short: saline, dextrose, hydromorphone, morphine, fentanyl, ketamine, and sterile water.<sup>1</sup>

The Food & Drug Administration (FDA) and the American Society of Health-System Pharmacists (ASHP) publish an up-to-date list of current shortages, discontinued drugs, medications that are not commercially available and resolved shortages.

*FDA Drug Shortage Database: [www.fda.gov/Drugs/DrugSafety/DrugShortages](http://www.fda.gov/Drugs/DrugSafety/DrugShortages)*

*ASHP Drug Shortage List: [www.ashp.org/Drug-Shortages](http://www.ashp.org/Drug-Shortages)*

Compounding pharmacists may be able to help during drug shortages by obtaining quality pharmaceutical ingredients and compounding the needed drug in the most appropriate dose, dosage form, and flavor to help ensure that patients get the critical care they require. Cases arise in which although there is not a shortage, mass-market medications may need to be adjusted to fit a patient's unique need. Perhaps a patient requires a lower dose than what is commercially available or flavors need to be added to make a medication more palatable for pedi-

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**Kerri and Clay:** "My son's allergy medicines were causing terrible side effects. Now that we have been coming to The Salt Room we have been able to control his symptoms with salt therapy."

**Jessica L.:** "My son looked and felt better after just one session. His cough wasn't as bad. I felt he could breathe so much better."



**Joseph Cannizzaro, MD:** "I have been recommending The Salt Room for years. It has helped my patients with respiratory nuisances and skin problems, reducing symptoms while we address the root cause to improve their long-term quality of life."



Cannizzaro Integrative Pediatric Center

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atric patients. Pharmacists can also prepare medications which are free of problem-causing additives.

Pharmacists would not be able to compound a medication if it has been withdrawn from the market due to health risks and concerns.

## HELPING DURING THE FLU SEASON

In the United States, influenza activity often begins to increase in October and November typically peaking between December and February, and lasting as late as May. The Centers for Disease Control and Prevention (CDC) estimates that influenza has resulted in between 9.2 million and 35.6 million illnesses, between 140,000 and 710,000 hospitalizations and between 12,000 and 56,000 deaths each year since 2010.<sup>2,3</sup> Increased demand for medications used in the prevention of influenza or to lessen the symptoms of the virus has created drug shortages during past influenza seasons.

Tamiflu (oseltamivir phosphate) is an antiviral drug used to keep the influenza virus from multiplying in the body and reduce symptoms. A liquid version of this medication is available and particularly useful for pediatric and adult patients who have difficulty swallowing capsules. Pharmacists can compound the commercially available capsule form of the drug into a flavored suspension on an emergency basis, using FDA-approved directions. The FDA reports on its website that there is no current shortage of these medications.<sup>4,5</sup> However, should increase demand create a shortage, it is our goal to be able to provide patients with this much needed therapy

*References available upon request.*

*Juan Lopez, PharmD is a personalized medicine pharmacist with Pharmacy Specialists Compounding Pharmacy in Altamonte Springs, FL. Pharmacy Specialists is proud to be Central Florida's only nationally inspected and accredited compounding pharmacy. For more information on how personalized medicine can help you please call 407-260-7002, email [Juan@MakeRx.com](mailto:Juan@MakeRx.com), or visit [www.MakeRx.com](http://www.MakeRx.com). ■*



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# Why You Need to Provide Cross-Generation Communication Training to Your Staff

By Jennifer Thompson

Automation is reshaping entry-level jobs in the global economy, and medical practices are not exempt. Healthcare organizations need to have plans in place to develop soft skills among their employees (and physicians!). By 2030, 14.7 million workers under 30 will face job displacement, especially in the service and food industries. Understanding how this shift will impact your medical practice is critical to your long-term success.

If you ever worked at Chili's or Taco Bell, you know that many of those positions have historically served as first entry points into the working world for many young people. It's how many of us developed soft skills—attributes that enable someone to interact effectively and harmoniously with others.

However, those jobs are disappearing fast, depriving young people of gaining those soft skills critical to understanding the basics of customer service such as patience, how to communicate and solve problems. Moreover, 39 percent of employers say a skills shortage is the leading reason for entry-level vacancies. Companies (and medical practices) need to start looking for new ways to help develop soft skills among their teams.

The McKinsey Global Institute recommends that businesses begin looking at apprenticeships and investing in new hires by teaching them higher-level soft skills from day one. Providing job retraining and enabling individuals to learn marketable new skills throughout their lifetimes will also be key for medical practices who want to achieve longevity.

## ONGOING TRAINING IS CRITICAL

Increasingly, medical practices have begun to establish partnerships with healthcare-focused training organizations to develop the skills needed in their workforce and to provide ongoing solutions to engage, educate and empower their teams. This enables large-scale retraining without creating the staff and overhead to manage it internally.

Soft skills relate directly to online reviews and reputation management. One common complaint online is rudeness by a staff member or a physician. And disrespect (or the perception thereof) often stems from a generational gap in communication between healthcare providers, staff and patients. Not only do your physicians and employees need soft skills, but they also need to understand that communication tactics vary across different generations.

For example, a younger doctor may be labeled as rude because she/he does not look a patient in the eye, or prefers to text instead of talking. Younger generations no longer want or need to have face-to-face (or voice-to-voice) interaction. However, many older patients still seek out genuine person to person communication. Therefore, physicians and staff need to understand the communication needs of intergenerational patients and act accordingly.

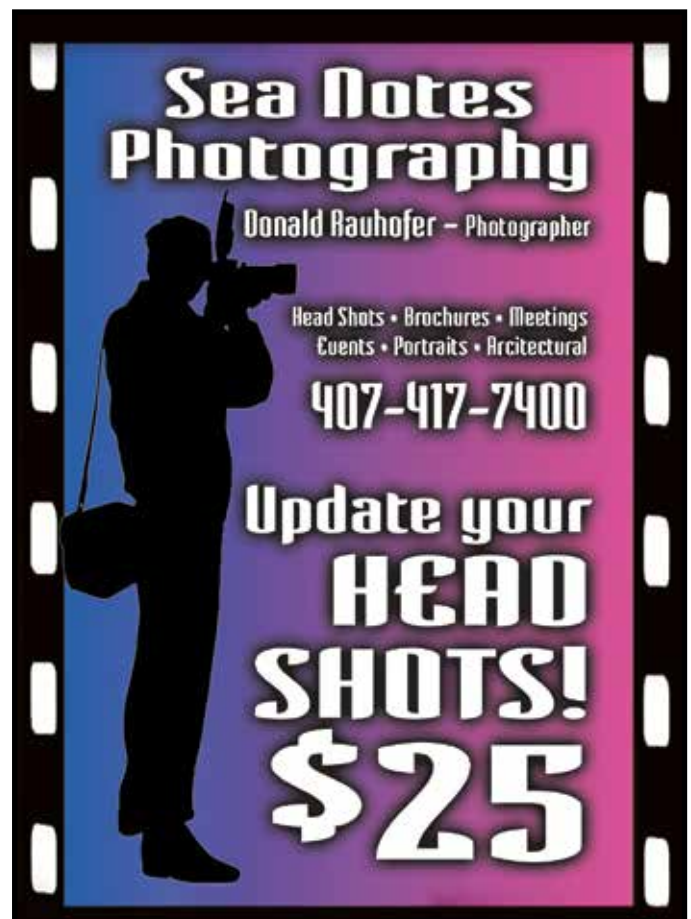
Also, if someone calls and needs directions to your office for

an appointment, the answer you give may be quite different if the patient is 25 (and uses Google to figure it out) or if they are 75 and may need a bit more hand-holding. If you tell an 80 year old to "Google it," you may find yourself on the short end of a 2-star review.

The key to avoiding low-star reviews is to focus on getting to the root of the problem. Differences in communication styles can impact critical patient-employee interactions, not to mention back-office challenges amongst employees. Understanding the differences between intergenerational patients and employees will allow you to focus on the cause of negative reviews.

Training your team on the key differences of communicating across generations will impact every aspect of your practice from employee hiring, retention, patient satisfaction and the bottom line.

*Jennifer Thompson is the President of Insight Marketing Group and Insight Training Solutions and can be reached at 321.228.9686 or [jennifer@insightmg.com](mailto:jennifer@insightmg.com).* ■







# FloridaMD

## 2019 EDITORIAL CALENDAR

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It is hard to be aware of everything happening in the rapidly changing medical profession and doctors want to know more about new medical developments and technology, procedures, techniques, case studies, research, etc. in the different specialties. Especially when the information comes from a local physician specialist who they can call and discuss the column with or refer a patient. They also want to read about wealth management, financial issues, healthcare law, insurance issues and real estate opportunities. Again, they prefer it when that information comes from a local professional they can call and do business with. All advertisers have the opportunity to have a column or article related to their specialty or profession.

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<b>MARCH –</b>	<b>Orthopaedics Men's Health</b>
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<b>JUNE –</b>	<b>Allergies Pulmonary &amp; Sleep Disorders</b>
<b>JULY –</b>	<b>Neurology / Neuroscience Advances in Rehabilitation</b>
<b>AUGUST –</b>	<b>Sports Medicine Robotic Surgery</b>
<b>SEPTEMBER –</b>	<b>Pediatrics &amp; Advances in NICU's Autism</b>
<b>OCTOBER –</b>	<b>Cancer Dermatology</b>
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