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TECHNOLOGY IN USE Medicine, Computer Science and You

Richmond University Medical Center

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A Message From the President & CEO



Advances in neurosurgery over the past decade are unprecedented, and we are excited to bring those modern technologies to the Staten Island community along with our entire neurosurgery team at the Richmond Brain and Spine Center – which now includes neurosurgeons Douglas Cohen (graduate of Harvard Medical School, residency at New York-Presbyterian /Columbia University Medical Center) and Erico Cardoso (residency at University of Ottawa, fellowship at Institute of Neurological Sciences & University of Western Ontario). We welcome all of our new staff that have joined Richmond University Medical Center's family as we continue to

expand our clinical services, combining state-of-the-art medicine with personalized care.

As our hospital team expands, so does our primary care network – which now covers 16 sites across Staten Island. These resources are here for you and your family, and are often the conduit to the specialists you need in all areas of care. Our goal is to continue providing access, convenience and value for all healthcare and wellness needs.

For emergency care, I am pleased to share that our renovations are soon to kick into high gear. Our successful VITAL capital campaign, led by the Richmond University Medical Center Foundation, has raised funds to bring you the region's latest and most advanced Emergency Department. Follow all of the developments through our foundation's social media pages.

Hersina

Daniel J. Messina, PhD, FACHE, LNHA President & Chief Executive Officer

OUR MISSION STATEMENT

The Medical Center is a not-for-profit healthcare provider serving the diverse community of Staten Island and its neighbors. We provide quality patientcentered care through a full spectrum of emergent, acute, primary, behavioral health and medical services. We do this in an environment that promotes the highest satisfaction among patients, families, physicians and staff.

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CONTRIBUTORS

Amanda LoMonaco and William Smith

Richmond University Medical Center is an academic and clinical affiliate of Mount Sinai Hospital and has an integrated surgical program with SUNY Downstate Medical Center.

WWW.RUMCSI.ORG 355 BARD AVENUE, STATEN ISLAND, NY 10310

The information contained within this magazine is not intended as a substitute for professional medical advice, for which your physician is your best choice.

The Brain and Spine Center at Richmond University Medical Center

BRINGING EXPERIENCE, EXPERTISE, AND CUTTING EDGE TECHNOLOGY TO THE TREATMENT OF NEUROLOGICAL DISORDERS.

THE RICHMOND BRAIN AND SPINE CENTER TREATS NEUROSURGICAL CONDITIONS IN BOTH ADULTS AND CHILDREN.

Patients with a variety of conditions, including benign and malignant brain tumors, spinal disorders, and traumatic brain injury can seek help here. The Center offers neurocritical care, and also treats patients with pituitary tumors, herniated discs, spinal stenosis, and trigeminal neuralgia (a chronic pain condition that affects the trigeminal nerve, which carries sensation from the face to the brain), as well as other conditions.

Technological advances that couple medical imaging with computers are giving doctors a powerful treatment tool that translates to better results for patients, especially those suffering from neurological disorders. One of the latest cutting-edge technologies is known as stereotactic surgery, or stereotaxy. "This minimally invasive approach to surgery allows surgeons to use computer guidance to locate small targets inside the body and perform various procedures, such as implantation of metal screws, with very small incisions," says Douglas Cohen, MD, board certified neurosurgeon at the hospital's Brain and Spine Center.

"Essentially, the technology allows surgeons to get a very close look into a patient's body before making any incisions. Without this technology, surgeons typically had much less definitive knowledge of the targeted area before starting a surgical procedure. This meant they had to use larger incisions in order to see inside the body," adds Erico Cardoso, MD, board certified neurosurgeon at the Center. "ESSENTIALLY, THE TECHNOLOGY ALLOWS SURGEONS TO GET A VERY CLOSE LOOK INTO A PATIENT'S BODY BEFORE MAKING ANY INCISIONS..."

- ERICO CARDOSO, MD



"It allows us to do procedures without as big an incision that was typically needed prior to these technologies," Dr. Cohen says. For patients suffering from a range of neurological disorders, smaller incisions mean less blood loss, less pain and quicker recoveries. "The technology allows us to do CT scanning in the operating room and it links to a work station, which allows us to use computer guidance for the procedures," Dr. Cohen continues.

As part of its commitment to providing patients with the best and most current treatments, the Richmond Brain and Spine Center has acquired more imaging and computer technology that improves treatment options and outcomes for patients, Dr. Cohen says. "Before, we did not have perfect visualization, especially deep in tissues," says Dr. Cohen. "Now, we essentially have perfect visualizations without having to cut and dissect."

This technology can be used in procedures to treat various disorders and conditions of the brain and spine, including fractures of the spine or neck, as well as spinal stenosis, which is the narrowing of the canal that houses the spinal cord.

"It helps us remove the things that need to be removed and leave behind the healthy bone and tissue," Dr. Cohen says.

For example, a patient suffering from a fracture, or a patient with degenerative problems of the spine, may require the implantation of medical screws in the bone. Prior to operating, doctors perform an intraoperative scan to determine the bone anatomy in the area, allowing them to target precisely where a screw is needed, Dr. Cohen says.

"Once we have the patient in the operating room, we can use a very minimal incision, just big enough for a screw, because we know exactly where on the bone it is needed, how big it is and where the screw needs to find purchase," he adds. Previously, this would have required doctors to perform surgery using larger incisions so that they could see the area and understand the extent of the problem.

"This is a much easier and much more minimally invasive approach," Dr. Cohen says. "These new technologies help us to improve the efficiency and safety of the procedures we perform. We're essentially able to do the same work through smaller incisions. That means less blood loss, shorter hospital stays, quicker recovery, less pain and less risk."

Since Richmond University Medical Center is a Level I Adult Trauma Center and Level II Pediatric Trauma Center—the highest distinctions possible—the ability to implement cutting edge resources when life is threatened is critical, says Dr. Cardoso, who has been in practice 35 years. "With traumatic brain injury, you want to know you'll be able to rely on the right equipment, with a medical staff that knows how to perform the latest in surgical techniques that are best for the condition being treated. At the Brain and Spine Center, you have the resources you need."



CONDITIONS TREATED AT THE RICHMOND BRAIN AND SPINE CENTER



Brain Tumor: A tumor is an abnormal mass of tissues in which cells multiply uncontrollably. There are two principal kinds of brain tumors. Primary tumors, which means the tumor originated in the brain, can be either benign or malignant. Metatastic tumors, which means that the tumor started somewhere else and traveled to the brain, are considered cancerous and malignant.



Meningioma: This tumor, which grows from the membranes (called the meninges) that surround your brain and spinal cord, is the most common type of tumor in the head.



Herniated Disc: The bones that form the spine in the back have small, doughnut-like discs between them that act as cushions. The discs have a tough rubbery outside (like a tire) but are filled with a semi-liquid nucleus (like a jelly doughnut). A disc that is herniated — or ruptured, bulged, or slipped — is one where the nucleus of the disc has pushed out of the outer membrane into the spinal canal.



Spinal Stenosis: Stenosis is the narrowing of a space in the body; spinal stenosis refers to the narrowing of the open spaces in your spine.



Spine Disorders: This category includes conditions that affect the spine, including infections, injuries, and tumors.



Neurocritical Care: Involving life threatening diseases or conditions affecting the nervous system (the brain, spinal cord, and nerves), patients who may be in need of this kind of care include those who have had strokes, ruptured aneurysms, seizures, or brain or spinal cord injury.



Pituitary Tumor: The tiny pituitary gland, located at the base of the brain, is often called the master gland, because it controls other hormone glands in your body. A tumor that develops in this gland can result in the over- or underproduction of any, or many, of various hormones.

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Traumatic Brain Injury: Trauma to the brain can affect many parts of your body, depending on where the injury is and its severity. It may include loss of consciousness or confusion, headache, difficulty concentrating, memory loss, and limited movement or speech function.



Trigeminal Neuralgia: The trigeminal nerve is a major facial nerve responsible for both sensation and motor control, like that used in chewing. Trigeminal neuralgia is a condition in which sudden, severe pains, or constant, low intensity pains, are experienced in the face.

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Meet the Doctors

EXPERIENCE AND EXPERTISE GUIDE THE RICHMOND BRAIN AND SPINE CENTER.

Richmond University Medical Center is proud to have Douglas Cohen, MD, and Erico Cardoso, MD, at the helm of the Richmond Brain and Spine Center. Dr. Cohen brings over 21 years of experience to his position, and Dr. Cardoso has 35; together, they bring their deep knowledge of neurosurgery and practice expertise to bear on the solutions they find for their patients. Dr. Cohen, who is board certified in neurological surgery, is also an assistant professor of neurosurgery at Mount Sinai. He received his undergraduate degree from Cornell, and his medical degree from Harvard Medical School. He completed his residency in neurological surgery at New York Presbyterian Hospital.

Dr. Cardoso, also board certified in neurological surgery, received his education internationally. His graduate degree, in anatomy, is from the University of Ottawa in Canada; his medical degree is from Goias Federal University in Brazil; he completed neurological residencies at the Ottawa Civic Hospital, and neurosurgical fellowships at both the University Hospital at the University of Western Ontario in Canada and the Society of British Neurological Surgeons at the Institute of Neurological Sciences in Glasgow, Scotland.

Both physicians are fellows of the American Association of Neurological Surgeons, and have received numerous accolades from peers, including being named Super Doc or Top Doc in the metropolitan area for many years running.

> "IN THE OFFICE, WE TAKE A TEAM APPROACH. WE WORK VERY CLOSELY WITH PAIN MANAGEMENT SPECIALISTS AND PHYSICAL THERAPISTS. AS DR. CARDOSO SAID EARLIER, SURGERY IS NOT ALWAYS NECESSARY."

> > - DOUGLAS COHEN, MD

"I always wanted to work with the brain and mind continuum. I started out doing neurology and then discovered I wanted to be in surgery," says Dr. Cohen.

Dr. Cardoso wanted to be in the field for a simple reason: out of love. "Here's a reason I love this work. I had a patient — a mother of three, in her thirties who had lost her vision from a condition



caused by high blood pressure in her head. Every medication to decrease the pressure failed. But once we inserted a shunt to drain fluid from the brain into the peritoneal cavity (abdomen), her vision was restored, and she was able to go back to caring for her children."

The most common conditions Dr. Cardoso treats include, in the brain, tumors, bleeds, cysts, fluid accumulations, and infections. The conditions he sees most frequently that affect the spine are mostly degenerative ones, such as disc herniations and pinched nerves, as well as fractures or infections. "Surgery is not always needed," Dr. Cardoso said. "It is only performed when nothing else works."

"I often see conditions such as herniated discs, spinal stenosis, and back pain," says Dr. Cohen. "There are some symptoms that people can look out for," he goes on to say. "You might have pain radiating down one leg, tingling, weakness, or headaches, for example. But it's important to note that not all serious conditions present symptoms."

Both doctors say that there are some general recommendations for things you can do to help prevent neurological disorders that might otherwise end up needing surgery. "Lifestyle changes, such as losing weight and quitting smoking, can keep conditions from starting or from getting worse," says Dr. Cohen.

"Absolutely," agrees Dr. Cardoso. "Most of the spinal degenerative conditions can be prevented by maintaining your ideal body weight and getting daily exercise." The doctors say that trauma conditions receive 24-hour coverage at Richmond University Medical Center. "When a trauma occurs that affects the head, one of us is automatically called," says Dr. Cohen. "They'll do a head CT scan immediately to check for bleeding or a skull fracture, to help us determine if surgery is necessary."

"In the office, we take a team approach. We work very closely with pain management specialists and physical therapists. As Dr. Cardoso said earlier, surgery is not always necessary," says Dr. Cohen. "Our office coordinator, Mae, will walk you through everything, from your first appointment to post-op scheduling, if that is needed."

Mae Zoltowsky, RN, agrees. "As a nurse and coordinator I follow patients from their first consultation through their surgical and post-surgical experience. Although the doctors see patients in several locations, I am their point of contact for questions, authorizations, and referrals. If surgery is needed I help guide patients from booking to postop visits. In the office at Bard Avenue, I am there to take patient's health history and initial assessment. After surgery, if a patient has questions, I am available to address any concerns. I work very closely with the doctors and help them to create a center that is focused on the quality and continuity of care."

Dr. Cohen goes on to say, "We are extremely enthusiastic about our updated equipment. With these state-of-the-art tools and our team efforts, we can really make a difference for our patients."

TECHNOLOGY AT WORK IN THE RICHMOND BRAIN AND SPINE CENTER

A QUICK LOOK AT THE CRITICAL INTERACTION BETWEEN MEDICINE AND COMPUTER SCIENCE – AND WHAT IT MEANS TO YOU.

ehm Vision R FD







If you were allowed to take a tour of the kitchens at a famous restaurant, you'd probably be in awe of the chefs, the line cooks, and the speed at which everyone worked — but you'd recognize the equipment: pots, pans, spoons, spatulas, whisks, and the like. Likewise, in a gardening center, there might be several levels of lawnmowers and edgers, but you're pretty sure you could locate one by sight.

A surgical suite is different — and the state-of-the-art surgical equipment used by the neurosurgeons at the Richmond Brain and Spine Center isn't going to be familiar to many people. Here's a glimpse at a few of the fascinating, newest tools in the doctor's arsenal against disease.

The Ziehem Vision RFD 3D

Even its name sounds like something out of Star Wars. However, this equipment isn't science fiction — it's hard science. With it, the surgeons can see both two-dimensional and three-dimensional imaging quickly, accurately, and at the operating table, for precision assistance. It's streamlined for ease of movement, with both a touchscreen and a joystick for optimum control.

The Ziehm Imaging NaviPort Interface

This piece of equipment takes the x-ray based inter-operative imaging of the Vision RFD 3D one step further, giving surgeons a real-time navigation guide. It takes the dimensional data recorded and automatically aligns it with the patient's anatomy — at the same time that it references surgical instruments on the monitor. Doctors can use this equipment for an overview to help determine the exact positioning of implants or screws, for example, and also refer to it for the status and results of the procedure as it is being performed.

The Sonopet Ultrasonic Aspirator

An efficient, highly accurate and effective device, the aspirator resembles, at first glance, a tool you might see in the dentist's office. Instead, it's for use by surgeons, affording them the ability to surgically remove diseased body tissue cleanly and relatively swiftly. For the doctor's ease of use, it is lightweight and ergonomically designed; for the best results for the patient, it allows the surgeon meticulous control of the suction, irrigation, and power needed for the operation. The device comes with multiple tips in various diameters and lengths, so the surgeon can select the ones necessary for a procedure, whether it involves soft tissue, fibrous tissue, bone, or any combination.

COMMON BACK CONDITIONS

WHAT THE SYMPTOMS ARE....AND HOW TO PREVENT THEM.

Age can be a factor in many conditions of the spine. However, there are things that you to keep your spine healthy. Here are a few examples.

CONDITION	SYMPTOMS	PREVENTION
Herniated Disc	Spinal pain, usually in your lower back; leg pain, weakness, or numbness.	Make sure to lift objects correctly, using your legs and not your back; don't twist when lifting. Do not strain your back muscles. Keep off extra weight, and do not smoke.
Spinal Stenosis	Cramping in your legs, when you walk or stand for a long time, that is relieved when you lean forward. Numbness or weakness in the leg or foot.	Exercise — including aerobic movement, resistance training, and stretching — to strengthen your spine and keep weight under control. Proper body mechanics — good posture, correct lifting.
Degenerative Spine Conditions	Pain that ranges from dull and annoying to severe and disabling. Restricted mobility. Leg pain.	Maintain a healthy weight. Avoid smoking. Use correct lifting techniques, exercise regularly, and reduce stress, which can cause muscle tension.

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or visit www.rumcsi.org/walkin

HOW MUCH DO YOU KNOW ABOUT YOUR BACK?

YOU PROBABLY TAKE YOUR BACK FOR GRANTED—UNTIL IT STARTS TO HURT. THINK ABOUT IT—YOUR BACK IS A PART OF YOUR BODY THAT'S IN NEARLY CONSTANT USE. WHETHER YOU'RE SITTING, STANDING, OR MOVING, YOUR BACK AND ITS MUSCLES ARE PROVIDING SUPPORT ALL DAY, EVERY DAY. TEST YOUR KNOWLEDGE OF THE BACK BY TAKING THIS QUIZ.

1. How many bones are in your spine? A. 33 B. 50 C. 60 D. 70

2. What position is best for your back when you sleep?

A. On your backB. On your stomachD. On one side with the knees flexed toward the chest

3. Which of these sports can cause dangerous back injuries?

A. SoccerB. VolleyballC. RacquetballD. All of the above

4. How many Americans will suffer back pain at some time in their lives?

A. 2 out of 5	B. 1 out of 2
C. 1 out of 3	D. 4 out of 5

5. What is the average recovery time for low-back pain?

A. 2	weeks	B. 1 month
с. 3	months	D. Indefinite period

6. Disks cushion vertebrae in the back. What are they made of?

A. Bone	B. Tendons
c . Cartilage	D. Muscle

7. Which of these is a significant risk factor for backache?

A. Being underweightB. Being overweightC. Being tallD. Being short

8. Which of these measures will help a backache?

A. Several days of bed rest C. Ice pack **B.** Massage **D.** B and C

9. How should you lift a heavy object?

A. Bend from the waist C. Twist to set the object down **B.** Squat, then lift **D**. Lock your knees

10. What are the warning signs of a herniated disk?

A. Pain

C. Shooting back pain when you cough B. NumbnessD. All of the above

ANSWER KEY_

1. A. 33. There are 33 bones are in the spinal column, from the skull to the tailbone. 2. D. The best position for sleeping is on one side with the knees flexed toward the chest. 3. D. Rough contact, twisting, and sudden movements in these sports can cause back injury. 4. D. Back pain is a frequent cause of short-term disability in people under age 45. Low back pain is the fifth leading reason that people visit their doctor. 5. B. The average is 1 month, but it can take up to 6 weeks. 6. C. Cartilage. Ligaments encase the disk. 7. B. Extra pounds strain muscles and joints. 8. D. (B and C). Apply ice or a cold pack the first 48 hours, then treat with heat. A massage by a certified massage therapist can help release tension and ease soreness. Staying in bed for long periods of time can make a backache worse because your muscles become stiff. 9. B. B. Quat, then lift. Keep the back straight and use your knees to lift. 10. D. All of the above. A herniated disk puts pressure on nerves resulting in pain. Herniated disks are most likely to occur in the lower back.



New World Salmon Florentine

Ingredients

This casserole uses chunks of fresh salmon with a lot of healthy omega-3 fatty acids. It also has real cheese for flavor. Don't use low-fat Swiss—it won't melt properly.

- 2 cups flaked cooked salmon fillet (about 12 ounces)
- 2 cups fresh baby spinach leaves, washed and shredded
- 2 cups cooked tri-color chunky pasta
- 2 stalks celery, sliced thin
- 1¹/₂ cups skim milk
- 1 teaspoon Dijon mustard
- 2 ounces shredded Gruyere cheese (about ¾ cup), divided ¼ cup sun-dried tomato pieces, chopped (not oil-packed)
- 1 teaspoon fennel seeds

Directions

Preheat oven to 375°F. Combine salmon, spinach, celery, and pasta in an ovenproof baking dish.

Heat milk in a small sauce pan; don't let it boil. Stir in mustard and half the Gruyere until it melts. Add sun-dried tomatoes and fennel seeds. Let cook for a few minutes until tomatoes are softened. Pour sauce over salmon mixture. Top with remaining Gruyere. Cover and bake at 375°F for 30 minutes.

Serves Two

Each serving contains about 400 calories, 31 g protein, 16.5 g fat (37 percent calories from fat), 68 mg cholesterol, 29.5 g carbohydrates, 3 g fiber, and 611 mg sodium.



With Philip Otterbeck, MD, Chief of the Endocrinology Division

HEALTHY LIVING

Healthy Living Q&A BRAIN FOOD

When we want to improve our health, it's best to take a systematic approach. Get more sleep. Exercise consistently. Eat better. What exactly does "eating better" mean when it comes to your brain? Well, a full 60 percent of your brain's weight is fat — and a full fifth of that is from *fatty acids*, which the human body does not produce; it must be consumed. So there's a good starting point for feeding your brain right.

Q. How do I add "fatty acids" into my food intake? And what do they do, anyway?

A. Fatty acids help brain and nerve function, and are associated with necessary inflammatory and antiinflammatory responses. Omega 3 fatty acids are found in oily fish including salmon, herring, sardines, and mackerel; in flax seeds and nuts, especially walnuts; and in dark leafy greens like kale and spinach. Omega 6 fatty acids are found in poultry, eggs, avocado, and nuts. Just add these to your shopping list — and keep them balanced in your daily meals. (Hint: avocado oil is neutral-tasting and can take high heat. It's an easy substitute for butter or other oils when sautéing, and you can even use it for baking.)

Q. Okay, I'll grill some chicken and have a side of spinach. What else do I eat for brain health?

A. Saute your spinach with olive oil and garlic and you'll have added a serving of anti-oxidants. Blueberries and other deep colored fruits and vegetables are a great source of these as well — and you might be happy to hear that dark chocolate contains them, too!

Why anti-oxidants? When your body uses oxygen, one of the waste products is called a "free radical," which, if left to roam around your body, causes damage. Anti-oxidants are like a free radical vacuum cleaner.

Q. What else should I know about feeding my brain?

A. When you feed your brain, you're feeding your entire body. In fact, although the brain is only about two percent of your body weight, it uses a full 20 percent of your body's energy. If you're not feeding your brain, you can get fatigued and usher in cognitive and memory problems. When you're feeling depleted, good brain food snacks are nuts and berries, as well as bananas and pumpkin seeds (which supply magnesium, used in neurotransmitter release and nerve function).

To submit your question to Dr. Otterbeck, Chief of the Endocrinology Division, email it to info@RUMCSI.org, subject: Q&A. Your question could appear in our next issue!



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