Why is geriatric cardiology a rewarding field to work in?

Dr. Maria Octavia Rangel from **Wake Forest University School of Medicine** in the US has been making significant changes to the lives of older adults with heart problems ever since she was studying for her master's degree. By blending clinical practice, clinical research, and teaching and mentoring the next generation of medical professionals, Octavia uses her passion for improving the lives of older adults to improve treatment, medication, and rehabilitation.

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PROFILE

Fields of research
Cardiovascular medicine, geriatric cardiology

Research project
Octavia has conducted a variety of research, including investigating heart health assessment and personalized rehabilitation

Funders
Wake Forest University Health Sciences, US National Institute on Aging (NIA)

The REHAB-HFpEF trial is supported by the NIH, under award number R01AG078153. The contents are solely the responsibility of the authors and do not necessarily represent the official views of funding agency.

Talk like a ...

geriatric cardiologist

Cardiac stress test — a test of the heart's ability to pump blood when under pressure

Cardiovascular disease (CVD) — a disease of the heart, blood vessels, and circulatory system

Cardiology — a branch of medicine dealing with the diagnosis and treatment of diseases of the heart, blood vessels, and circulatory system

Echocardiography — a medical imaging tool using ultrasound waves to examine the heart

End-stage renal disease — also known as kidney failure, the final stage of long-term or chronic kidney disease, when the kidneys no longer successfully filter and remove excess fluids and waste from the body

Geriatric — relating to the healthcare of older adults

Heart failure with preserved ejection fraction (HFpEF) — a type of heart failure where the heart gets stiffer and does not relax properly

Internal medicine — a branch of medicine focused on diagnosing, treating, and preventing disease

Regadenoson — a drug used to diagnose and understand heart problems by increasing blood flow to the heart

According to the British Heart Foundation, around 640 million people globally have cardiovascular disease (CVD). In the US, data collated by the American Heart Association show that roughly three in four adults aged 60-79 have CVD, rising to about nine in ten adults aged 80 or older. For these people, both their physical and mental health can be affected, reducing their ability to enjoy life and spend time with loved ones.

Based at Wake Forest University School of Medicine, Dr. Maria Octavia Rangel (who goes by her middle name) has dedicated her career to supporting older adults with CVD and studying new ways of improving life expectancy and quality of life. When Octavia was 15, her father died from a heart attack. He had suffered from CVD from an early age, having his first heart attack at only 35. Octavia's dad was a medical professional in Venezuela. At her dad's funeral, Octavia met many of his patients and they made an impression on her. "Their gratitude was more powerful than the sadness

Dr. Maria Octavia Rangel performing a transesophageal echocardiogram with a cardiology fellow in training.

of his loss," says Octavia. "I realized then what a life of service and helping others meant, and it cemented my desire to become a doctor."

How did a master's project enable Octavia to make a difference?

As early as her master's degree, Octavia carried out impactful research to learn if a drug called Regadenoson was safe to be used for evaluating the heart health of individuals with end-stage renal disease (a type of kidney disease that impacts heart health). Kidney disease puts stress on the heart, making heart disease the leading cause of death among individuals with kidney disease.

To assess how well the heart is at pumping blood when under pressure, patients take part in cardiac stress tests, where they engage in physical exercises, such as using an exercise bike, to increase their heart rate. This enables cardiologists like Octavia to diagnose heart problems, learn more about the severity of existing issues, or observe how well treatment is working. For some individuals, these active forms of stress tests are not possible. That is where Regadenoson comes in, as it causes stress on the heart in a similar way to exercise.

Once used, Regadenoson mostly leaves the body through the kidneys, but for individuals with kidney disease it takes longer to get rid of it. For this reason, individuals with end-stage renal disease had previously been excluded from initial safety testing of the drug. "With our study, we provided evidence that Regadenoson is safe to use in individuals with advanced renal disease," says Octavia.

How can personalized rehabilitation help older adults?

Octavia is currently working on a research trial called REHAB-HFpEF, exploring the impact of personalized physical rehabilitation on older adults with heart failure with preserved ejection fraction (HFpEF). "The goal is to demonstrate that, in comparison to the current state of care, personalized physical rehabilitation intervention reduces rehospitalizations, death, and mobility disability," explains Octavia. "HFpEF is the most common form of heart failure in older adults, particularly females, and it is associated with significant impairments in physical function. Until recently, it had limited evidence-based treatments. Our findings could help support the approval by regulatory agencies of this personalized rehabilitation intervention and make it available for the thousands of older adults who live with this condition in the US, to help them improve their life expectancy and slow down the toll that HFpEF imposes on their physical function and independence."

Octavia is helping to recruit participants for the research, and to ensure the research is conducted in the correct way. "I provide clinical support to the research staff," says Octavia. "I am also expected to expand the reach of this trial by proposing and executing additional studies."

How does Octavia combine her clinical and research interests to support her patients?

Octavia's experience in research inspires how she supports her patients. "Although they would benefit from it, many of our older patients cannot participate in traditional cardiac rehabilitation due to the physical demands that it involves," explains Octavia. "If we could meet them where they are first, and work on key domains of balance, strengthening and endurance, they could then reach a state at which they can safely participate in regular cardiac rehabilitation. So, I am very much looking forward to the results of the trial to help implement these changes."

What else does Octavia do as a geriatric cardiologist?

Working in geriatric cardiology inspired Octavia to create the Geriatric Cardiology Program at the medical center where she is based. "Our mission is to provide high quality, multidisciplinary care to geriatric patients with cardiovascular disease and, especially, to those with overlapping geriatric syndromes and complex medical conditions," explains Octavia. "We aim to provide personalized care that is aligned with the patient's values and focuses on preserving their health and independence. We also aim to continue to build on the long and prolific trajectory that Wake Forest has had in aging research by strengthening interdepartmental collaboration."

Octavia also shares her passion and expertise by teaching and mentoring others following in her path, which she finds incredibly rewarding. "In addition to my passion for caring for older adults, I am committed to medical education," says Octavia. "My proudest career achievements are my teaching awards and mentoring. They reflect my passion for cardiology and my desire to make that passion contagious!"

About *geriatric cardiology*

Geriatric cardiology is a varied and exciting field to work in, with the potential to improve the lives of older adults living with cardiovascular disease (CVD). Geriatric cardiologists tend to work on the overall health and well-being of their patients, rather than purely focusing on CVD. They learn about their patient's personal values, goals, and other medical conditions they may have, and work collaboratively with them to create their treatment plan, making each case unique. Geriatric cardiologists also use tools such as cardiac stress testing, echocardiography and blood tests to aid with diagnosis, tracking progress, and treatment outcomes.

As Octavia has demonstrated, combining research interests with a clinical career working with patients can be beneficial, and it can be rewarding to train and mentor others. "The field of cardiology is continuously evolving in multiple aspects, from drug development, intravascular device therapies, and interventions, to preventative interventions and cardiac imaging," says Octavia. "Since cardiovascular disease remains the number one cause of death in the US, it is also a field of great public health interest and growth."

Working in such a fast-moving field can be complex and challenging, and cardiologists will often be faced with difficult situations where it may not always be possible to achieve the outcome they wanted for their patients. However, many patients will experience better life quality and expectancy after seeing a cardiologist.

Octavia is incredibly enthusiastic about her work. "Helping older adults manage their cardiovascular conditions with maximum benefit and minimum side effects is hugely rewarding," she says. "Empowering them and their caregivers with the necessary knowledge and understanding of their cardiovascular condition in the context of their overall health situation, so they can make the best treatment decision for themselves, aligned with their values and beliefs, is vital."

Pathway from school to *geriatric cardiology*

Biology, chemistry, and physics form the foundation for an understanding of cardiology, and a high competence in them is likely to be required for further study in medicine.

At college or university, topics such as biochemistry, physiology, fluid dynamics, electrophysiology, and pharmacology will all contribute to your understanding of cardiology.

Octavia adds, "Having exposure to psychology helps you take better care of patients."

During your college or university studies, get involved in research projects being conducted in your department to gain direct experience of biological research.

Explore careers in *geriatric cardiology*

The American Heart Association (**heart.org**) and the American College of Cardiology (**acc.org**) provide useful information, resources and volunteering opportunities. You could even consider becoming a Student Member, which gives you access to more information, meetings, conferences, and opportunities to meet professionals working in the field.

The British Medical Journal has published a helpful article about becoming a cardiologist: **www.bmj.com/careers/article/the-complete-guide-to-becoming-a-cardiology-doctor-**

Learn more about the work of Octavia and her colleagues in the Section of Cardiovascular Medicine at the Wake Forest University School of Medicine: **school.wakehealth.edu/departments/internal-medicine/cardiovascular-medicine**

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Meet *Octavia*

I really liked school and learning about anything and everything! I enjoyed reading and dancing. I practiced classic ballet for many years while growing up, which equipped me with the discipline I would need in my medical school years and gave me an outlet for self-expression.

My father inspired me to study medicine. He was a physician specializing in obstetrics, supporting patients throughout pregnancy and childbirth, in Venezuela, my home country. He was deeply passionate about life and learning, and he was a philanthropist. Despite suffering from cardiovascular disease from an early age, he lived to be 74 years old, against the odds for the time.

When I started to get involved in clinical research, I felt the need to acquire skills to better understand and conduct clinical trials. My master's degree equipped me with knowledge in biostatistics, bioinformatics, clinical research design, and ethics and regulatory processes.

I had contemplated studying engineering, so while in medical school, I thought that applying concepts of physics, fluid mechanics, and electricity to understanding how the heart worked was fascinating. These concepts were also fundamental to understanding the different disease processes that affected the heart and how they manifest in the body. It all just made so much sense! It was also very uplifting to learn that many heart-related conditions are treatable and that a potentially life-threatening condition could be overcome with timely intervention.

I tackle challenges by focusing on what really matters and what needs to be done to overcome the situation. I think about options and alternative scenarios, even if they are not exactly what I want. I ask myself, "If this or that happens, is this an acceptable alternative?" And I always try to find common ground when a challenge involves others.

I switch off from work by spending time outside in nature and with my family and friends. I enjoy singing and dancing, and I also like to make photo books of cherished memories from trips, special occasions, and day-to-day events.

I aim to keep learning and adapting to deliver the best care possible to my patients. I hope I continue to experience the joy of teaching. I aim to continue to help close knowledge gaps in the care of older adults with cardiovascular disease through my participation in clinical trials.

Octavia's *top tips*

1. Stay open to learning and exploring. Keep a mindset of ingenuity, wonder, and curiosity.
2. Be humble. Honor the trust that people put in you.
3. Life happens, and it is not linear. You can do and achieve anything you put your mind to, but it is okay if it does not happen all at once!

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