



## DDS Profile: Rotonya M. Carr, MD, FACP

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For much of my career, I have identified as a “primary care hepatologist” and physician-scientist who really enjoys unraveling how lipids play a role in liver disease pathogenesis. I also now identify as the chief of an incredible gastroenterology division charged with promoting the careers of our faculty, restoring digestive health to our patients, training the next generation of gastroenterologists and hepatologists, and helping shape our research mission. I quite literally have the best job I have ever had and in the best profession, and so it may come as no surprise that I think often (and am asked often) about how I got here in my career. Yet, no matter how much attention I give that question, the answer continues to evolve. On any given day, in any given week, I have glimpses of different parts of my life that have been so critical to my current career, although I would not have known the impact of those experiences while they were happening. What remains consistent, however, is where my story starts.

I was born to and raised by a single mother of two children who nurtured my brother (now a retired veteran) and me with the help of my grandmother, a tight-knit extended family, and a hands-on community. I grew up in Charleston, South Carolina—a complicated place that I love. Charleston is at once made up of warm, gregarious people, artisan, historic buildings, a rich culture, picturesque landscapes; and relics of a confederate beginning, political conservatism, and resultant segregation that persisted throughout my childhood and continues de facto today. I am Black and grew up in neighborhoods with only other Black people. I had very little sense of economics when I was a child, but I now understand that my family did not have much. My days involved school, church (a small church of about 3–4 Black families), playing outside with my friends, sports, and spending time inside with my brother. I was a quiet child, although always in my mind, I had a lot to say. I loved school, excelled at all of

my subjects, and always graduated at the top of my classes (except for high school when I graduated second). Schools were also largely segregated, and so for most of my childhood, I was educated in a school system that mirrored my own neighborhood.

This all changed in college. In fact, I suspect that the segregation of my city, race-based biases, and overt racism that predominated had a lot to do with the story of my college start. I went to Harvard—the first to go to college in my immediate family, the only one admitted to an Ivy League school from my high-school class, and one of only two Charlestonians in my college freshman class of 1600. Harvard was an accident for a child like me. My guidance counselor did not encourage me to apply to Ivy League schools despite being at the top of my class. My family wanted me to stay close to home. And Atlanta was the farthest place for college my imagination took me. A friend’s mother (who has always treated me like a daughter) is singly responsible for this part of my story. She taught me about what an Ivy League education could offer, encouraged me to apply, paid for my applications, and paid for me to visit Harvard after I got in. I hated Harvard when I visited. Cambridge was cold, dark, and unfriendly. There was snow even though it was Easter weekend. My host was unavailable, and there were few people who looked like me. Of course, I accepted the offer immediately on my return home because my friend’s mom had invested so much in this pursuit. I was a Southerner, after all, and if not polite, I was nothing at all. I had a back-up plan: try Harvard for a year then transfer to the closer-to-home school I had planned to attend before she derailed my dreams.

Although I took advantage of everything I could access at Harvard, Harvard was also segregated. In a way, it was like home. There were dorms where most of the Black students desired to live and few others wanted to live. There were social clubs that were exclusive to those with extreme means and so, like home, were not accessible to most minority students. The social scene (with perhaps the exception of athletic teams) was largely defined by race and class. Perhaps because I was quite naïve when I entered college and had

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few expectations (not having had family members to tell me what it would be like), I thrived at Harvard in spite of this reality. For others in my class, they do not recall our campus as fondly. One year turned into four, and I graduated with a degree in biology on the pre-med track. I was no longer the smartest kid in my class, had met and made lifelong friends with people from around the world, had traveled beyond the United States for the first time, and had decided to become a doctor—some kind of doctor.

I took a gap year before we had a name for time off between school periods and deferred my medical school admission to Cornell. I self-funded a year in South Africa volunteering at a small technical college in a rural town called Butterworth (near President Mandela's home). That year was quite formative for me as a young woman. Among other things, I learned that so much could be accomplished with imagination alone in spite of the many barriers I had already faced and had yet to face. By the end of my time in South Africa, I was ready to start my journey toward becoming a doctor.

My recollection is that I started Cornell rather undifferentiated; however, the discovery of my medical school essay challenges that narrative. I wrote about wanting to become an obstetrician/gynecologist (Ob/Gyn). While I have almost completely blocked out that memory, Ob/Gyn is a primary care field, and it makes sense that I was drawn to it initially. I was the recipient of a National Health Service Corps Scholarship for medical school and committed to a career in primary care on completing residency. Although my career has meandered, I remain deeply committed to primary care and prevention, and my current hepatology clinical practice and research niche are shaped by those values.

I left Cornell contemplating the possibility of what a career as a translational scientist could look like, after having met translational physician-scientists for the first time. At Cornell, Drs. Marvin Gershengorn and Ben-Gary Harvey introduced me to the concept of combining lab-based research and medicine. I spent my free summers doing basic research (the first time ever), published my first paper with Dr. Alvin Matsumoto (a University of Washington VA-based endocrinologist physician-scientist), and took those inspirations with me to my internal medicine residency at the Massachusetts General Hospital (MGH). My residency class was close-knit and all inspirations in their own right. Among my class, I suspect I was least likely to evolve toward the career I have today. Back then, I was committed to a career as a general internist, and it was only in my last year of residency that I realized how much I loved hepatology. Dr. Andrea Reid was my first hepatology mentor and remains a career and personal mentor and friend. Had I not rotated with her, I am convinced I would not have become a hepatologist.

I managed to build a career that allowed me to immerse myself in all of my loves: primary care, hepatology, and

basic science. After MGH, I devoted the first four years of my career as a general internist in Sikeston, Missouri at the Ferguson Medical Center, then a multispecialty group independent practice. Sikeston is in a rural part of the state with fewer healthcare resources than the places in which I trained and is the place where I truly learned how to care for patients—the whole patient. I was mentored by my cardiology colleague and friend, Dr. David Pffeferkorn, who sat across the hall from me. I saw diseases I had only read about in textbooks (like scurvy) and was exposed to addiction medicine. I must admit that I was still quite naïve in the latter, having never worked in an environment with such a breadth of drug and alcohol addiction. I immediately got to work in community service. Every week I traveled beyond Sikeston to provide health education, assist a community organization dedicated to reducing infant mortality, and share time with individuals who needed medical management of alcohol addiction. Sikeston is where I track my passion for advocacy for individuals suffering from the effects of alcohol.

My time in Sikeston is also when I got married. I am married to my wonderful husband, Tyree, and this year we will be married for 16 years. We have two incredible children (Tyree and Avery) and view our greatest responsibility (and challenge) as that of raising our children to become well-rounded, generous, and compassionate adults. Being a mother and wife has made being a physician and scientist that much more meaningful, because I want my family to also take pride in the work that I do. My husband, in fact, talks about my research better than I do!

When I left Sikeston, I started my fellowship in gastroenterology (GI) at the University of Pennsylvania (UPenn) as a T32 scholar initially desiring to work in a hepatitis C lab. After meeting with several potential mentors, I selected the lab of endocrinologist Dr. Rexford Ahima (now Chief of Endocrinology at Johns Hopkins) to work on the emerging topic of nonalcoholic fatty liver disease (NAFLD). This choice was a lesson in life coming full-circle. Dr. Ahima was interested in metabolism and insulin resistance and liver lipid droplet proteins that play a role in that physiology. My first paper as a medical student in Dr. Matsumoto's endocrine lab had been on mechanisms of insulin resistance. My GI chief was Dr. Anil Rustgi, who quite simply took a chance on me. I was an atypical T32 candidate, as I had not had any long periods in the lab prior to fellowship and entered fellowship as an older, married, primary care, community physician. There were also few examples of Black physician-scientists at UPenn; I knew three personally, and one was Dr. Ahima. I loved the Ahima lab and the potential it offered to answer fundamental questions. I was also terrible in the beginning. I had to learn all of the basic molecular biology techniques from scratch and took a long time to produce any usable data. I persisted, and Dr. Ahima

and Rustgi supported me along the way. After Dr. Ahima left UPenn, Dr. Klaus Kaestner became my mentor, an addition to my team that changed the trajectory of my lab studies. My co-fellows cheered me on, and I ultimately progressed to successfully apply for a K08 award and Robert Wood Johnson Harold, just enough funds to hire a technician and start my own lab as I began my first faculty position at UPenn.

Since the start of my lab, my focus has been on early-stage alcohol-associated liver disease (ALD) and NAFLD–steatosis. We examine the mechanisms by which hepatocellular lipid droplet proteins are regulated by lipids themselves and connect this biology to physiologic perturbances of glucose and energy homeostasis. My goal is to learn everything I can about this early stage in order to prevent disease escalation. This strategy melds with my identity as a “primary care hepatologist,” but for most of my career has been an unpopular choice. The majority of liver disease research to date has focused on advanced injury, and so it has been challenging to work to help the paradigm evolve. I do believe things are shifting, however, toward preventive hepatology, and I am excited to contribute to this dialogue.

At UPenn, I had the privilege of also becoming a mentor to several fellows and junior faculty, experiences that have served to sharpen me in every sphere of my life. I am so grateful to those who have entrusted me to help guide them with their careers, and I hope that sharing my journey helps them to avoid some of the pitfalls I have encountered. Clinically, I started and directed the hospital’s first Liver Metabolism and Fatty Liver Program, rotated on the hepatology inpatient service, and performed endoscopies.

The importance of my launch at UPenn under my mentors’ guidance cannot be overstated. While there, I discovered that I cared about more than my lab science. I found opportunities to help others navigate career decisions, got involved with advancing diversity on campus, found (and have retained) my peer research support group of underrepresented minorities on campus, and earned professional society leadership opportunities with the American Gastroenterological Association, the American Association for the Study of Liver Diseases, and the American Liver Foundation. By the time of my promotion to Associate Professor in 2021, I was still, however, one of only a few Black women faculty at UPenn at that rank and an even smaller minority among physician-scientists [1]. I had begun working on the latter issue at UPenn before I was recruited to become the Division Head of Gastroenterology at the University of Washington (UW GI) in 2021.

My move to Seattle with my family during the COVID-19 pandemic was unanticipated. The pandemic has been tough on everyone, and it was no different for my family. My husband and I both work and had to integrate home school like so many other families when schools shut down. He was also recovering from an accident he suffered at the start of the

pandemic. My lab was shut down for nearly a year during a very vulnerable period of my career (my R01 had started just a couple of years earlier). Physician-scientists suffered losses that could not be restored, and for minority-scientists who traditionally have fewer resources compared with peers, these losses were even more detrimental [2]. I was frankly not considering adding a move to all that my family had to manage.

The pandemic also created an incredible opportunity to reflect on those things that bring me greatest joy and how I wish to spend this phase of my career. I prayed, engaged my husband, and spoke to my most trusted advisors. The slowness of the pandemic allowed me to simply get back to the core of what I most value—what I could do to help others. Once I dimmed the spotlight from my own career and all the things that changed during the pandemic, I was able to harken that young woman recent college graduate who took a leap of faith from the familiarity of her home environment, crossed the continent, and made her own way with perfect strangers. I said, “Yes.” And I am so glad I did!

I’ve led the GI division at UW with my administrative and faculty partners for less than a year, and the time has metaphorically flown and literally flown (as I am now three hours behind most of the people I know). I work for a department chaired by a fellow GI physician-scientist, Dr. Barbara Jung, whose leadership style and vision are what drew me to apply. Moreover, my position integrates all of my professional loves: working with incredibly collaborative team members who are fiercely dedicated to their patients and their profession; creating space and opportunity for those who are just getting started with their careers; supporting the education and research missions; focusing on my clinical interest in fatty liver diseases; and rebooting my own lab’s science (with three new dedicated members), energized by the breadth and caliber of research at UW and the institution’s commitment to team science. This pace of new learning is unmatched so far in my career, and I gain so much from our UW GI team daily.

Alongside this professional growth, I have had the opportunity to partner with ten other Black GIs since 2020 to advance GI health equity through the Association of Black Gastroenterologists and Hepatologists (ABGH). Admittedly, this is another stretch area for me, as my fellow co-founders all have much more experience in health equity than I. I am humbled by the resolve, expertise, and elevation of equity in GI health by our ABGH members through national (e.g., Color of Crohn’s and Chronic Illness) and global (e.g., Global Liver Institute) collaborative efforts to bring forth diverse patient perspectives. I’ll end this essay as I began... there are so many parts of my life story that have led to the career I have today. I am sure that, had I written this essay yesterday or if I were to start from scratch tomorrow, little here would remain. My journey has meandered yet in some

ways has come full-circle, perhaps as an opportunity to pay it forward. Thank you, universe, for this chance.

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### Declarations

**Conflict of interest** Dr. Carr has received research support from Intercept and Merck and provided consultative services for AstraZeneca.

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