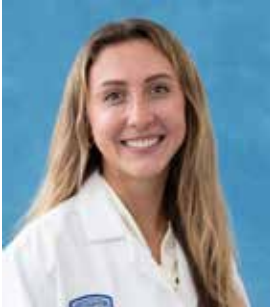


Perseverance
and passion:
The road to
being a woman
in neurosurgery



Illustration by Steve Derrick

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“Why would you want to be a neurosurgeon? Don’t you want a family? A life?” Dr. Kimberly Kicielinski, an assistant professor of neurosurgery at the Medical University of South Carolina, was asked these questions by her advisors when she decided to apply for a residency spot in neurosurgery during her fourth year of medical school.¹ Unfortunately, this is a common response women receive when they share their decision to enter neurosurgery.

Aspiring female neurosurgeons are forced to reconsider if their passion aligns with the lifestyle they want. Neurosurgery is a demanding field, notorious for long hours and grueling cases. And, the notably low percentage of women in the field doesn’t help. Although a majority of matriculated medical students have been female since 2017, only 21.5 percent of resident positions, and 9.6 percent of active neurosurgery physicians were women as of 2021.^{2,3} There is something powerfully beautiful about the field that attracted Kicielinski. What made the specialty worth it for her? Is it truly possible for women to have it all?

The science of neurosurgery is generally considered to have begun in the early 20th century by Cleveland-born physician Harvey Cushing (AΩA, Harvard Medical School, 1914), but it was not until 1961 that Dr. Ruth Kerr Jakoby became the first board-certified female neurosurgeon in the United States.⁴ Such a delay could be explained by the social constraints of her time.

Since then, the expansion of women in neurosurgery has been present but slow. Between 2000 and 2009, the female attrition rate of neurosurgery residents was roughly 17 percent compared to 5.3 percent in their male counterparts.⁵

Women entering into higher levels of academia face similar disproportion, with only 5.8 percent of full professor neurosurgeons being women in 2019, and only two female chairs of neurosurgery across the country as of 2023.⁵ The late entry of women into neurosurgery pioneered by Jakoby does not account for these disparities

70 years later: the social constraints she faced have lessened over time, but the inequality has not.

Of the progress that has been made, much of it has been accomplished only in the past 30 years.⁶ Reasons for avoiding neurosurgery permeate the gender discussion, including discrimination, lifestyle factors, a lack of mentors, and a perception that the field may not align with personal goals.⁶ These barriers do not disappear in residency. According to a 2021 study, female neurosurgery residents in 35 programs (32.1 percent) find themselves without any female faculty.⁷ Of the 58 programs (53.2 percent) with both female faculty and residents, the female faculty were younger and less likely to be board certified or occupy positions of higher academic rank.⁷ Additionally, it is important to note that, although the percentage of women holding neurosurgery residency positions has increased, this percentage is spread across the country and many find themselves as the only woman in their program, too few to create a critical mass large enough to attract others like themselves.⁶

As of 2011, Case Western Reserve University, Mount Sinai School of Medicine, and the University of Utah have become known for accepting the largest numbers of female neurosurgery residents, perhaps maintained through the established critical mass.⁶ How did these critical masses form?

A critical mass

Dr. Olindi Wijesekera, a resident at Case Western Reserve University and University Hospitals Cleveland Medical Center, was curious why and where these masses tended to form. She sought out programs with a significant female presence, a sentiment often shared by female residency applicants.⁸ “When you go to a program where you see women residents who are accomplishing things that are traditionally not, or you’re told are traditionally not able to be accomplished, it gives you a sense that these goals are very much attainable,” she explains.

Residency already has so many unknown variables and challenges: “Can I handle it?” “Do I actually know enough to be here?” Why include the additional unknown of, “Will I be treated differently because I am a woman?”

This consideration becomes especially important for women who plan to start a family in residency and want to know if they will be supported at their program. Wijesekera notes, “I think [a female presence] is really meaningful. When one girl that I applied to residency with found out I was pregnant, she messaged me and said,

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‘you know, I’m at a program where most people don’t even have serious significant others, let alone children.’”⁸

And so the culture of her program is very different. She would be the first person to have a kid and she doesn’t know how faculty would respond or how her program would support her. She feels really isolated and is trying to go through that experience by herself.

“It’s really different from being at Case where I’ve already seen one, two, three female residents go through a pregnancy and raise a small child, and they’re also supportive of me. Same with the faculty, both men and women. It’s only shown me that these goals are truly attainable,” Wijesekera’s friend wrote.

Knowing there are already women in the department who succeeded makes it easier to enter into a situation without concern. “Especially when the women there are happy and love their jobs,” says Dr. Krystal Tomei, Residency Program Director at University Hospitals in Cleveland, Ohio.³ “It’s a bit of a self-fulfilling prophecy. When I started here, there was only one other female faculty. And then there was another, then a fourth, and now we have a fifth.

“We brought on people who were good at their jobs. When you’re in a department that has female faculty, it’s a lot easier for female prospects to come in and not feel like they need to be the trailblazer,” Tomei explains.

Critical masses don’t form overnight. Studies of operations within the corporate world have shown that the magic number is three for individuals within any minority to be considered a critical mass.¹⁰ One woman alone may not always be enough to sway others within the department and eliminate inherent biases. Before Dr. Sepideh Amin-Hanjani (AQA, University of Illinois College of Medicine, 2006, Faculty) accepted a faculty position at University Hospitals in Cleveland Ohio, she did not stand on the side of a critical mass at her previous institution.¹¹ Throughout her career, colleagues would occasionally imply that her contributions were notable, but that she was the exception among women neurosurgeons rather than the rule. “It’s kind of a backhanded compliment in some way, right? Saying, ‘you’re great, but not everybody is like you, you’re not representative of your peers,’” is how she describes it. Amin-Hanjani remains optimistic that this mindset will shift once a core group is established. It takes years of intentional effort to expand the diversity of a program into one able to sustain itself.¹¹ Or perhaps, as it so happened at Case Western, it takes the grasping of an opportunity to prove ability.

Long before Wijesekera began her residency, women were the only applicants willing to accept the remaining

spots at Case Western. This was during a time when very few programs were taking any women at all, so they took the opportunity they were presented with. Since then, Case Western has become more diverse, and as of 2024, has an impressive five female neurosurgery residents and six female neurosurgeons on staff. “Sometimes it’s not a grand gesture. A lot of times it’s purely coincidence or out of necessity, and then you realize they’re very good or better, and gender doesn’t matter at all. Then you naturally begin to give other people chances where you didn’t before,” recognizes Wijesekera.⁸

The demographic shift ended up being a positive transition in Case Western’s history, with the University Hospital’s department consistently ranking in *U.S. News and World Report* Best Hospitals. Many of the women working or training there actively sought out Case Western’s program for its strong female representation.

A culture of understanding

It is important to recognize that being a successful female neurosurgeon is not dependent on the number of women she works alongside. Nor is a critical mass absolutely necessary in allowing her the flexibility to have a family. The most important factor is that the department as a whole is understanding and supportive of what she needs.

When starting at University Hospitals, Tomei did not feel she faced an uphill battle as one of two female neurosurgeons on staff. She explains that this is in part due to her not being the one to break the ice, but more as a result of the established culture. She found sponsors in two male leaders of the department, who focused on hiring surgeons who valued teamwork and empathy over other noninclusive factors.⁹

It is important for a department to recognize that there are many unique challenges that come with being a woman in a male-dominated field. Direct and indirect microaggressions may permeate interactions with coworkers, and patients. It can be difficult for women to find life partners who are comfortable with their busy surgical schedule, and it is equally difficult for a single woman to care for her household in addition to her patients.

For those planning on having children, the physical demands of pregnancy only exacerbate the long work hours, and the impact of operating room fumes, radiation exposure, and workplace safety for pregnant women is still not fully understood.¹² To make matters worse, they have to plan when, and where, they can breastfeed, while barely having enough time to eat lunch.

Taking time off for maternity leave causes women residents to wonder if they will fall behind and need to catch up later in their training. They may worry about placing an excess burden on their colleagues, and end up placing the blame on themselves. Women may struggle to balance being a mother and being a neurosurgeon while feeling half as good at both. For women who grew up with parents who were always around, this can be an especially hard adjustment as they come to terms with their job limiting time with their children. It can be much more difficult to establish boundaries as they struggle to feel secure in their position, wanting to do whatever it takes to prove themselves. Unfortunately, this can mean accepting lower pay than male counterparts.

This is not meant to scare off the prospective female applicant, but rather to draw attention to the realities of the field. It's essential to know how deep the water is before you dive in. "It was important for me to know about certain things because when you're a student, everything sounds great. Everything is magical, right? So much to learn. You're so enthusiastic. And then day one, when you have that pager as a resident, everything changes. So it was good to get a reality check. Not every day is going to be flowers and roses. But either way I still moved forward with it," explains Dr. Tiffany Hodges (AQA, Duke University School of Medicine, 2008), assistant professor and interim director of the Neurological Surgery-Oncology Center at University Hospitals in Cleveland, Ohio.¹³

Hodges was first deterred from entering the specialty by a female mentor of hers.¹³ Her story is not unique. Many women will be repeatedly warned by advisors and/or family that neurosurgery is too demanding, they will never get married, or they simply won't belong. "You can't let that affect you, especially if you're passionate about something. You should not let that deter you from your goal. But, at the same time, I was very realistic," Hodges continues.¹³

No residency program is a smooth ride, and it is necessary to think critically about the realities of each specialty. Every resident will need to make sacrifices, and women often face unique challenges that set them apart from their male colleagues. Most women-heavy departments are more conscious of such sacrifices, making it a more appealing environment to enter.

The transition to restricted 80-hour work weeks and maternity leave policies have improved the lifestyle and flexibility of programs. However, a goal of any department should be to foster a considerate atmosphere built on supporting one another. Finding a program that can

achieve this success should be a desirable quality for any resident applicant.

There are a million reasons not to go into neurosurgery, but when you can't imagine yourself anywhere else, you have to follow your heart. "You are sucked in by just how unbelievable it is to do what we are asked to do on behalf of patients in the operating room—although it turns out that neurosurgeons do far more than simply operate. We are involved in the care of our patients prior to, during, and long after the operating room. I love what I do, and I don't second guess it. Love really is the right word, it is a passion, a calling. It's not something you engage in casually. It's not a nine-to-five job," says Dr. Aviva Abosch, chair of the Neurosurgery Department at the University of Nebraska Medical Center.¹⁴

When Abosch was beginning her training, she knew of no other women in the field, so she paused, wondering if she could pursue neurosurgery while achieving her dreams of also raising a family. "When you look up and you don't see people cast in your own image, it takes it a tremendous leap of faith," she explains. Abosch is now one of only two female chairs of neurosurgery departments in the country.

This tug of war is real and influences many women in their choice of specialty. By listening to the stories of women who trekked ahead and succeeded, the prospective applicant can better understand what sacrifices are necessary, and what it will take to achieve their goals. A strong support network is integral to the advancement of any individual's career in neurosurgery. This not only applies to the people at home who can assist with childcare, food preparations, and cleaning, but also extends to the team in the hospital. Wijesekera was fortunate enough to find such a group at University Hospitals. "Because it is such a demanding job and you are expected to know how to do so many different things that when you succeed, it is extremely rewarding. But, what's better is when those around you celebrate with you," explains Wijesekera.⁸

It is common for fellow residents and attendings to help cover each other so parents can get home to their children. Practices such as these make the tough days bearable, and the good days even better.

An adapting field

Before there was a cultural shift toward positive lifestyle management and team cohesion, the grueling work hours were borderline dangerous.¹ It was not uncommon for a department to be built on an "every man for himself" attitude, and the field tended to attract individuals

that embodied this perspective.¹ For Kicielinski, her passion for neurosurgery was more than the functional correlation of human anatomy and problem-solving; she was also enamored with the field's humanistic side. "People mark their life based on the day they met you. How you handle that moment really changes how they feel about their illness or its part in their lives. If you could be thoughtful and mindful in that moment, it really changes how people feel about what's happening to them."

"Showing up for people in those dark moments, that's really deep to who I am and what gives me meaning and joy," Kicielinski explains.

This wasn't a common interest among neurosurgeons who maintained a very technical approach. Nevertheless, Kicielinski continued to pour her time and energy into ensuring her patients always felt supported. Today, the field—and medicine as a whole—is experiencing a movement toward these humanistic values. Kicielinski notes, "We've had a ton of applicants with experience and interest in health disparities and the intersections within neurosurgery. There's a lot more awareness toward the softer things that were not really considered when I was first starting. Even as the new generation is going through training, they're changing the field."¹

Dr. Theresa Elder, a third-year resident at University Hospitals in Cleveland, Ohio, embodies this transition. As someone who feels particularly invested in patient outcomes, she often volunteers to take on the tough job of delivering bad news.¹⁵ This is her way of making certain that the highest degree of sensitivity and empathy go into such difficult conversation.

The modern culture of neurosurgery welcomes this sort of personal involvement and recognizes the importance of self-care. "The tasks on your plate may feel daunting at times, but there is flexibility in how you get the work done in a way that is meaningful to you," says Elder.¹⁵

There is also flexibility in the residency curriculum on a larger scale, with many programs now offering opportunities to complete enfolded fellowships, earn advanced degrees, and/or conduct funded research. Once a physician decides what is most important to them, there are a growing number of ways to individualize their training to align with their goals. The demands of neurosurgical residency may be inescapable, however, the possible variations in practice are multifarious. A neurosurgical practice can take many shapes and sizes depending on the physician's values. Dr. Pelagia Kouloumberis, a locum surgeon for private practice in Arizona, sees this as the

hidden secret of neurosurgery, and ultimately the future of the field.¹⁶ Locum work is more common in emergency departments or with hospitalist physicians since their job design makes it easier to step in temporarily. Positions that require continuity of care, such as neurosurgery or primary care, are a bit harder. In Kouloumberis' case, she takes emergency call in times of high demand to help fill in the gaps and avoid stretching the full-time surgeons too thin. Her extra pair of hands is a win-win scenario for physicians and hospitals, who are then able to keep their elective surgeries scheduled when an emergency rolls in.

Since her work revolves around trauma, her practice is supported by the usual flux through the emergency room. When she's not on call, Kouloumberis enjoys spending time with her daughters, and building the life balance she always wanted, with her pager entirely out of sight.

"This wasn't something that was on my radar at all when I entered neurosurgery, but as I got tired of the long hours and missing my kids, I began looking for a way to still do something exciting, something I love—which is surgery—while managing my personal time," Kouloumberis explains.

As more of the younger generation searches for a greater work-life balance, Kouloumberis believes locum work will become more popular. She also notes that locum work is beneficial for neurosurgery, as it encourages teamwork and shared practices.

Of course, such a design comes with limitations. This model may be common in private practices, but in academic settings it is virtually nonexistent. A locum physician will likely not have an established lab or administrative position. Additionally, it is uncommon to receive a stable locum position right out of residency because first having an established career allows for the experience needed to support part-time work. Understanding how a traditional clinical practice works is an important perspective to have experienced. Locum practice is one example of how female neurosurgeons are changing the field to build flexibility into their practice.

Advice and persistence

The road to a career in neurosurgery is long and filled with opportunities for personalization. "Think about who you are as a person, and from a temperament standpoint, what makes you feel fulfilled?" explains Abosch.¹⁴ "One of my mentors once pointed out that you want to think about the things that you will regret when you get to the end of your life. If one of those regrets would be not having a family and raising children, then you need to

prioritize that. Nobody ever got to the end of their life and said, ‘boy, I wish I’d written one more paper.’”

When contemplating if a specialty would provide life-long gratification, it would be helpful to carefully evaluate which defining characteristics of that career correlate with personal goals, and to seek out those who have accomplished something comparable to be a mentor to you. Above all, a love of neurosurgery and caring for patients should be at the front of a residency applicant’s mind.

Neurosurgeons advise that medical students should not pursue neurosurgery for anything less than an absolute passion. While lifestyle should not be the prohibitive factor, not everyone is cut out for neurosurgery, and it’s important to critically reflect on oneself before beginning down that path.

“I always tell students, if you can see yourself doing anything else, go do that, because you will constantly question your decision unless you are confident this is what you are meant to be doing,” advises Tomei.

There is no room for second guesses when it comes to midnight emergency calls from the hospital or missing family holidays. It can be difficult to know that about oneself so early on in medical school, or even at the end of the third year. It takes time and repeated exposure to all aspects of the field. It requires taking opportunities to probe deeper into the realities of neurosurgery. There will always be inherent difficulties given the nature of neurosurgery, but those within the field have steadily prepared the way for a more diverse and balanced future.

The persistent theme through each of the aforementioned women’s stories is an unparalleled drive toward neurosurgery, one that outweighed the hesitations. They were not deterred by the harshness of the field—they were attracted to the science, the skill, and the responsibility of being a brain surgeon. They followed their hearts while overcoming the difficulties that lay ahead.

Neurosurgery has seen a budding culture shift focused on attracting only the best and brightest, regardless of gender or race. It is integral that the field continues to promote such a transition and resist the tendency to scare off potential candidates with negative stereotypes.

“I tell applicants, you belong here. Neurosurgery needs your perspective, whether you’re female, Black, Native American—we need more diversity because the patients we take care of are from all walks of life,” says Kicielinski.

The primary role of a neurosurgeon is to be the physician. The culture has shifted away from regarding women only as female neurosurgeons, but rather as neurosurgeons who happen to be female.

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