

A severe case

Virginia's primary care practitioner shortage

by Katherine Schulte

When Staunton native Emma Harrison decided to pursue medicine, her grandfather asked his primary care doctor of several years, Dr. Katie Dunbar, to talk to Harrison about her profession.

Harrison, then an undergraduate student at the University of Virginia, met with Dunbar, a physician at Carilion Clinic Family Medicine – Waynesboro, to discuss family medicine.

“[Dunbar] was brought to tears talking about how much she loves her patients and how she has seen the same patients for decades and [has been] building up those relationships. ... And being there through generations, I think, is so special [to] family medicine, and hearing Dr. Dunbar talk about that was really what moved me to go into primary care,” recalls Harrison.

Harrison entered the University of Virginia School of Medicine in fall 2021 and is a member of its Generalist Scholars Program, a four-year mentoring, scholarship and community service program for students pursuing primary care. It accepts six incoming students a year.

Harrison says she wants to practice in a rural area once she graduates, largely because she has seen the need for health care professionals in her Shenandoah Valley community.

Although rural areas have more severe primary care provider shortages, the problem is widespread. And Harrison is part of a shrinking pool of U.S. medical students choosing primary care over other specialties. In 2019, the National Resident Matching Program had a record number of internal medicine positions — 8,116 — with a fill rate of 97.2%, but only 41.5%

of the positions were filled by U.S. senior medical students, the lowest percentage on record. Family medicine and pediatrics also offered record numbers of positions and had the lowest fill rates by U.S. seniors on record.

The United States, including Virginia, faces a shortage of primary care professionals that will only worsen as baby boomers age, but governments, medical schools and employers are taking corrective steps to encourage emerging doctors to choose a related specialty.

The Association of American Medical Colleges projects the U.S. will have a shortage of between 17,800 and 48,000 primary care physicians by 2034, according to a June 2021 report.

Dr. Sterling Ransone, board chair of the American Academy of Family Physicians, is a physician practice director at Riverside Fishing Bay Family Practice in Deltaville and knows the difficulty family care practices are having recruiting, particularly physicians seeking their successors.

“My worry is, who’s going to take care of my patients when I’m no longer around?” he says. “I think part of what we do as family physicians, we like to take care of the community. And the worry that a lot of us have is, what’s going to happen to those communities when we’re no longer able to practice?”

The symptoms

Although primary care can be defined in different ways, the category generally includes family care, general internal medicine, general pediatric care, and obstetrics and gynecology.

In 2019, Virginia had about 85 primary care physicians, nurse practitioners and



physician assistants per 100,000 adult residents, which means it ranked No. 25 among states for numbers of primary care clinicians, according to a report from the Virginia Commonwealth University Department of Family Medicine and Population Health and the Ambulatory Care Outcomes Research Network, funded by the Virginia Department of Medical Assistance Services. According to those entities' 2022 brief, Virginia needs 30% more primary care clinicians, or 1,456 more than the 4,872 it had in 2020 in order for all Virginians to have a primary care clinician they can see yearly.



Dr. Sandy Chung's Fairfax-based practice, Trusted Doctors LLC, has offered financial recruitment incentives to compete for primary care professionals.

Fewer than 10% of physicians, nurse practitioners and physician assistants work in non-metro areas of Virginia, although those areas account for 13% of the commonwealth's population, according to the Virginia Department of Health's Primary Care Needs Assessment publication.

Primary care clinicians are often patients' first points of entry into the health care ecosystem, particularly in rural, underserved areas.

"Our training as primary care physicians, we're trained to take care of a whole host of issues that walk through the office door," Ransone says. "We're also the ones who are trained to do preventative care."

Access to primary care reduces emergency room visits because of that preventive care. Also, "we have relationships with patients," says Dr. Steven Pearman, vice president of medical operations for Sentara Medical Group. "They trust us. We have pretty high confidence they're going to come back if something's not getting better."

In addition to an expected shortage of health care professionals due to an aging workforce, the U.S. also has a pipeline issue, as graduating medical students are seeking specialty placements outside of primary care. The problem isn't new, as more primary care clinicians in Virginia are closer to retirement

than to starting their careers, according to a 2022 brief from VCU and ACORN. In 2019, about 20% of Virginia's primary care workforce was 60 or older, while only 12% was under 40.

The diagnosis

One motivator for this choice is economics. Primary care physicians make less than other specialists, due, in part, to insurance reimbursement models.

"Because of the way our health system is set up in the U.S., if you do something physically — you do a surgery, you do a scope, you do something like that — those kinds of

things get paid a lot more than sitting and talking with the patient and doing what we call more cognitive medicine,” Ransone says.

In Virginia, the annual mean wage for a family care physician in May 2022 was \$224,940, according to data from the U.S. Bureau of Labor Statistics. The annual mean wage for a radiologist in Virginia was \$313,420. For an emergency medicine physician, it was \$315,290.

In an October 2022 report, the American Academy of Medical Colleges reported the mean education debt of medical school graduates was \$205,037.

But primary care practitioners’ passion can outweigh a longer loan repayment timeline.

“While there’s not parity [between primary care and other specialties], it is still a significant amount of money, relevant to many industries,” says Dr. Sean Reed, director of the U.Va. School of Medicine’s Generalist Scholars Program and a UVA Health clinician. “But it’s really more about finding what gets you off the pillow every morning.”

Additionally, some primary care clinicians have retired early or left patient care positions because of burnout, exacerbated by the COVID-19 pandemic and patient vitriol.

“Even now, we have more tools [to combat COVID-19] ... but there’s so much new sort of distrust in the health care system that it’s challenging when you go in wanting to be there for a family, for them not to trust in the care you recommend,” says Dr. Sandy Chung, CEO of Fairfax-based Trusted Doctors LLC and president of the American Academy of Pediatrics.

Trusted Doctors, which has about 180 clinicians across Virginia, Maryland and Washington, D.C., had to close a location in Maryland and reduce hours at a clinic in Virginia because of staffing shortages, Chung says.

The number of primary care practices that had a primary care clinician leave nearly doubled from 2018 to 2022, from about 40% to nearly 80%, according to the 2022 brief from VCU and ACORN. In 2022, a little over 40% of clinicians left practices to retire early.

Virginia’s government has taken some steps to help, adding \$82 million to the



Inspired by a primary care doctor in her hometown, U.Va. medical student Emma Harrison plans to practice primary care medicine in a rural community.

budget approved in 2022 for Medicaid reimbursements for primary care providers.

Treatment options

On the pipeline front, Virginia medical schools are seeking to cultivate medical school students’ interest in primary care through targeted programs, often including financial incentives.

At U.Va., if students fulfill the Generalist Scholars Program requirements and match into a residency in one of four primary care fields — family medicine, internal medicine, pediatrics or combined internal medicine-pediatrics — they receive a \$40,000 scholarship.

In their third semester, GSP students hold a “Primary Care Week” focused on drawing medical school students’ attention to the primary care field.

U.Va. also encourages rural primary care. Harrison received the full-coverage A.K. Turner Scholarship on the condition that she practice general medicine five years in a rural Virginia area following her medical residency.

“Serving a small community as their doctor has been my dream forever, but the fact that U.Va. is fully ... supporting me in this is just incredible,” she says.

At VCU’s School of Medicine, the Department of Family Medicine and Population Health’s division of epidemiology offers the Family Medicine Scholars Training and Admission Track (fmSTAT), which creates four-year cohorts of about eight to 10 students who receive additional mentorship, seminars and research opportunities. In their fourth year, students receive small scholarships, which vary but average about \$10,000, says department chair Dr. Scott Strayer.

Over the last 12 to 13 years, VCU has averaged 25 residents who match in primary care, and about 35% of those match in-state, Strayer says.

For their part, employers are upping the ante on recruitment and retention efforts for primary care physicians. Some health systems cite their missions and workplace

Continued on Page 42

From Page 40

wellness efforts as strong draws for clinical practitioners, but many employers are also offering financial incentives.

The Bon Secours St. Francis Family Medicine Residency, based in the health system's St. Francis Medical Center in Midlothian, offers a stipend to retain residents. If a second-year resident commits to working at Bon Secours upon completing his residency, he will receive \$72,000 in his second year and again in his third year.

"We've been very successful in retaining people that way. ... I can tell you that that's also very attractive to some. I have some medical students who decide to come here because of that. It's a big help," says Dr. Victor Agbeibor, the St. Francis residency program director.

Sentara Health provides stipends to some residents who agree to sign employment agreements in their second year, but Sentara declined to disclose amounts.

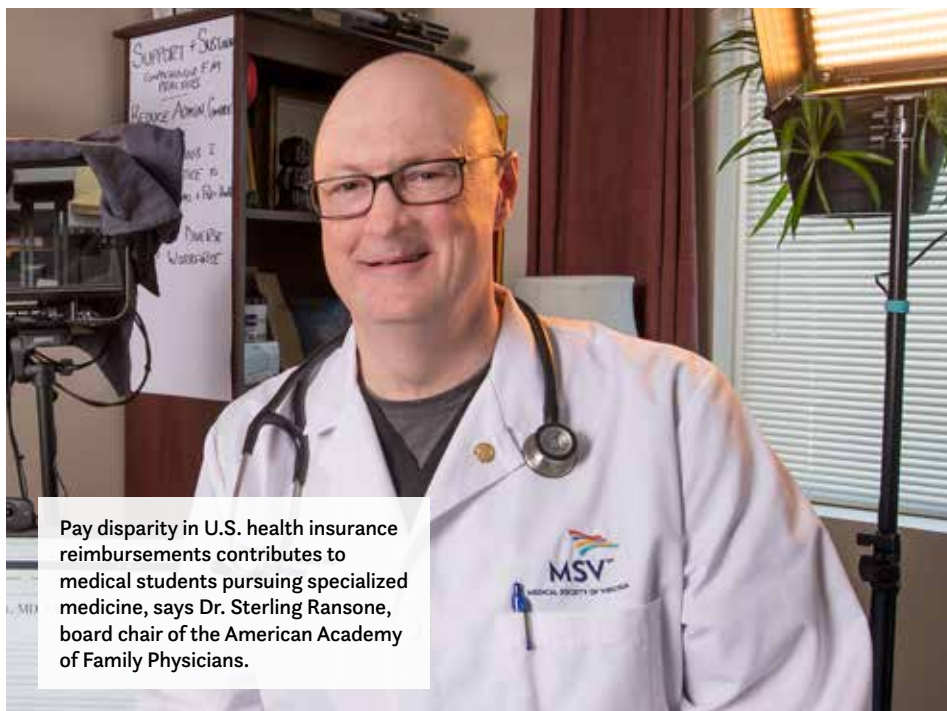
Physicians who work for nonprofit health systems like Roanoke's Carilion Clinic for 10 years might qualify for the federal Public Service Loan Forgiveness program, which forgives remaining direct loan balance after 120 monthly payments.

Carilion also offers tiered loan repayment assistance, usually for four years. Carilion's repayments vary, but the standard is about \$10,000 per year, although amounts increase for physicians in rural areas, says Dr. Michael Jeremiah, Carilion senior vice president and chair of its Department of Family and Community Medicine.

Calling in consults

The state government also will match an organization's loan support for qualifying practitioners in federally designated Health Professional Shortage Areas, up to \$140,000 for a four-year commitment, via the Virginia State Loan Repayment Program, administered by the Virginia Department of Health.

Carilion offered loan repayment assistance for Dunbar's position. "They ended up paying off my loans before I met all [of the fixed amount of assistance]. I had less loans than they offered [repayment for]," says Dunbar, who graduated from Eastern Virginia Medical School in 2009 and was able to finish repaying her loans with Carilion's help in 2020.



Pay disparity in U.S. health insurance reimbursements contributes to medical students pursuing specialized medicine, says Dr. Sterling Ransone, board chair of the American Academy of Family Physicians.

In Fairfax, where it's competing with area hospitals and health systems to hire primary care physicians, Trusted Doctors has offered sign-on bonuses, loan repayment assistance and stipends for moving expenses, Chung says. The practice's payment rates for nurses have risen about 30% from pre-pandemic rates, but revenue has remained flat and other expenses, like rent, have risen.

"My practice is a big practice," says Chung, adding that "it's hard, especially for smaller practices, to be able to afford this."

On the reimbursements front, Carilion converted 17 of its 42 primary care practices to meet the Centers for Medicare and Medicaid Services' rural health clinic requirements, allowing those facilities to receive slightly higher reimbursement rates. The health system had to make structural changes, such as employing a nurse practitioner or physician assistant at each clinic, as well as meet all accreditation requirements. The CMS State Operations Manual chapter on the certification process for rural health clinics totals 467 pages.

Trusted Doctors also sought help at the source. It worked with an insurer to change its payment models so that behavioral health and preventive care work received larger reimbursements. But that increase isn't about making a profit, Chung explains:

"When we're talking about more, we're talking about not losing money, getting ourselves to break even, so basically paying more so that it's sustainable."

There's hope for correcting the imbalance between primary care and other specialties, says Clark Barrineau, the Medical Society of Virginia's assistant vice president of government affairs and public policy. "I don't feel in my bones that we are not capable of fixing this, or at least improving upon it" by focusing on wellness in retention efforts and economic incentives in recruitment efforts, Barrineau says. "The good news is that everyone sees the problem."

Despite the heavy workload and disparate pay, primary care providers say their passion is what keeps them in their chosen field.

"Even though the work is a lot, it's always rewarding. There's never a day that I don't feel like I was doing something fulfilling and making a difference," Dunbar says.

Taking care of the whole person, whether it's a cough, a rash, a sore knee or something more serious, is enticing, Harrison says. "Being the primary care physician, you really develop a sense of trust with your patients. And that's just what medicine is all about, you know — taking care of people." ■

Wizards of National Landing

Amazon HQ2 opens to high expectations

by Katherine Schulte

Amazon.com Inc. thinks of its buildings “as almost living things,” says Holly Sullivan, Amazon’s vice president of economic development and public policy. Maybe that’s one reason why the first partially open tower of HQ2, the corporation’s \$2.5 billion East Coast headquarters in Arlington County, hums with activity.

On a Thursday in late May, the building — named Merlin after the codename for Amazon QuickSight, a cloud-based business intelligence service product — was abuzz.

Plants line the staircase to the second floor and are scattered throughout. With windowed garage-door-like walls on the ground floor tilted open during pleasant weather, Merlin can blur the distinction between inside and outside. “We think that our buildings do have personality,” Sullivan says. “We do want to help them grow. We do want to help them develop and evolve.”

Merlin is one of two 22-story twin towers erected as part of Metropolitan Park, HQ2’s first phase. As of Dec. 31, 2022, Amazon reported more than \$598 million in capital investment in HQ2, according to its first incentive application to the Virginia Economic Development Partnership.

So far, the No. 2-ranked Fortune Global 500 company has hired 8,000 HQ2 employees locally, and when fully open, Met Park can support more than 14,000 employees. About 2,000 employees moved into floors 1 through 14 of Merlin during HQ2’s first week, which began May 22, and

Amazon plans to add 1,000 to 2,000 more workers per week during the summer. The e-tailer held a grand opening for HQ2 on June 15, and it expects to have all existing HQ2 teams moved into both towers by late September or early October.

The e-commerce goliath announced HQ2 would be coming to Virginia in November 2018, and state officials trumpeted an anticipated 25,000-person Amazon HQ2 workforce by 2030, the biggest economic development deal in the state’s history. Initially, HQ2 was intended to be a \$5 billion project, split between Arlington and New York’s Long Island City neighborhood, before Amazon pulled back from its New York plans amid local backlash over government incentives.

But the unexpected arrival of the pandemic in 2020 — along with more people working remotely, followed by 18,000 layoffs by Amazon in 2022 and early 2023 — put a question mark on Amazon’s original plans for a bustling office campus in downtown Arlington.

Nonetheless, Amazon stands by its original HQ2 job creation goal, which would see it add 17,000 jobs over the next 6 1/2 years. “We are unwavering in our commitment to Virginia,” Sullivan says.

Office space isn’t obsolete for Amazon, which in May started a hybrid policy requiring at least three in-office days a week, although vice presidents set specific office policies for their teams. The e-tailer will adapt its spaces as needed, Sullivan says.



Merlin includes conference rooms, team suites and a plethora of common areas with varied seating.

Grand opening attendees toured Merlin’s 15th floor, although it was not yet open to employees. Amazon anticipated opening the remaining floors in phases. The lower floors of the second tower, named Jasper after the codename for an Alexa component, were set to be complete around the end of June.

A big landing

“We’re just really excited about this new milestone,” says Arlington Economic Development Director Ryan Touhill. “This

Metropolitan Park, the first phase of Amazon's HQ2 East Coast headquarters, opened in late May, moving 2,000 employees into Merlin, one of HQ2's 22-story twin office towers.



is going to be really great to see these buildings come online. It's really great to see Amazon's commitment to the community, and it's going to be great to see their workers coming in to National Landing and enjoying all the things that have been built there all throughout the pandemic."

Composed of Potomac Yard, Crystal City and Pentagon City, the National Landing Business Improvement District came from the Crystal City Business Improvement District, which expanded its coverage in 2019 and changed its name in 2020. Economic development officials coined the term, but Amazon's HQ2 announcement popularized it.

Amazon leases 387,000 square feet of office space in Arlington from Bethesda, Maryland-based JBG Smith Properties, about 300,000 of which it will vacate this year as employees move into Merlin. JBG Smith is also HQ2's primary developer and developed the roughly 109,000-square-foot entertainment and shopping Central District Retail area in National Landing. The developer owns 2,856 apartment units and nearly 7 million square feet of office space in the district, with 1,583 apartments under construction.

In March, Amazon confirmed it would pause construction on HQ2's second phase, PenPlace, which was set to include

3.3 million square feet of office and retail space spread across three 22-story buildings, as well as the showcase spiral Helix building and 20,000 square feet for Arlington Community High School. But Amazon has since indicated it plans to move forward with PenPlace sometime in 2024, although it hadn't released an official timeline as of early June, according to Arlington Economic Development.

Due to Amazon's hybrid work policy, some observers have expressed concerns that area businesses will see less foot traffic than anticipated, but locals remain optimistic.

“Certainly, the numbers are a little bit different from pre-pandemic, where you sort of expected that generally people were on the five-day work schedule, but as their hiring increases, that still means many more bodies on the ground ... [who are] able to patronize area establishments,” says Arlington County Board Chair Christian Dorsey.

And, despite Amazon’s post-pandemic shift to hybrid work, Arlington and Alexandria will still benefit from an influx in residents who work in tech, says Terry Clower, director of George Mason University’s Center for Regional Analysis and the Northern Virginia chair of GMU’s Schar School of Policy and Government.

“With hybrid, maybe [commercial activity from office workers won’t be] as much, but if people are living there, that’s probably a more reliable market anyhow,” he says. “It shifts the nature of the demand a little bit — maybe it’s [a] more dinner than lunch kind of thing — but all of that just means that it’s still activity and it’s balanced out.”

Varied spaces

Met Park doesn’t offer free lunches, but it includes plenty of amenities and perks to welcome workers into the office. On the ground floor, employees and passersby can find free coffee at Good Company Doughnuts & Cafe. Employees have a bike storage room that wraps around part of the building, with racks for 620 bikes, as well as charging stations for e-bikes and options for bike repair, plus wash stations and showers.

Employees swiping into Merlin’s first “center of energy,” Amazon’s term for common areas or gathering spaces, are greeted by a strong smell of coffee emanating from Maryland-based Chesapeake Coffee Roasters, as well as a wall of grab-and-go drinks and snacks and a sitting area with booths. Baltimore-based Zeke’s Coffee is set to be the roaster at Jasper.

Head up the serpentine central staircase, and you’ll discover an arts and crafts room with a window-lined wall, high wooden tables and dogwood decorations hanging from the ceiling, a nod to Virginia’s state flower. Teams can book the room, but for several hours a day the studio remains open for employees to use as they wish.

If craft time isn’t their preferred break activity, workers can step next door into the



Commonwealth Joe Coffee Roasters co-founder and CEO Robert Peck expects HQ2 to boost business.

video game room or the dimly lit, carpeted billiards room with pool and foosball tables, as well as more seating options. For a surprise, pull the book titled “How to Throw a Party” in the bookcase and prepare for music and flashing lights.

Met Park also is dog-friendly — perhaps too much so, as barking is a given — with a wall dedicated to photos of employees’ pets, and dog stalls for employees to secure their pups while they grab food from an eatery, like The Daily, which features rotating daily specials of foods from around the world.

Merlin also incorporates outdoor spaces, including terraces and dog runs, and the third-floor terrace overlooking Met Park’s 2.5-acre public park has two electric grills.

Although more offices now have facilities for new moms to pump milk in privacy, Amazon’s mothers’ suite — decorated with

large photos of baby ducks — offers quiet rooms with armchairs, provided pumps and breast milk bags, as well as a fridge to store milk, a sink and a changing table. The two towers will have 27 mothers’ rooms across their two suites.

A design adaptation resulting from the pandemic and employee feedback, team suites provide collaborative spaces that teams can reserve to work on a project. Suites have different themes, but all include a lounge, flex space and variously sized meeting areas.

“One of the things we learned about our employees and the way that they missed working was more of that collaboration, so we’ve ... been more intentional in this building and in Jasper to create more of those convenient spaces for team building [and] quick meetings, whether it be for two weeks or two hours,” Sullivan says.

A broader reach

Amazon often proclaims its commitment to communities where it has a significant presence — whether it's through the \$2 billion Housing Equity Fund active in Arlington, and Nashville, Tennessee, and Washington's Puget Sound region, or allocation of retail space in its office buildings.

Met Park will house 14 ground-floor retailers, including a day care center that's open to the community. Merlin's second floor has a 700-person meeting room available to the community for reservations, with shutters along its window-lined wall that automatically adjust to outdoor light changes throughout the day or can be closed by remote control. The room's skylights feature electrochromic glass that can adjust to let in or block sunlight.

The public park includes looping walking paths, a children's playground and an off-leash dog walk, as well as a dog park that will open once grass has firmly taken root.

On the 15th floor, Amazon is growing an urban garden with vegetables like diva cucumbers, a nearly seedless variety. Washington, D.C.-based urban farming company Loving Carrots harvests the vegetables. Amazon donates them to Arlington-based Kitchen of Purpose, which uses the meals its culinary trainees cook for its food assistance program.

Since January 2021, the company says, it has committed \$795 million in loans and grants to create or preserve 4,400 affordable housing units in and around Arlington and Washington, D.C. According to apartment listing service Apartment List, the median rent for a one-bedroom unit in Arlington was \$2,096 in June, and the median for a two-bedroom unit was \$2,508. The median price for homes sold in Arlington was \$680,000 as of April, according to the Northern Virginia Association of Realtors.

Beyond offering the latest in office design for corporate employees, HQ2 is expected to spur further development in the surrounding area of National Landing and across Northern Virginia.

Amazon's campus is the crown jewel of National Landing, says Tracy Sayegh Gabriel, president and executive director of the National Landing Business Improvement District, who notes that there are other major area developments coming

online, too. One is developer JBG Smith's Crystal City Water Park, a 1.6-acre park, now under construction, which will have 11 restaurants and water features, including a body of water surrounded by a scalloped wall and topped by a bar.

"We're that lived-in downtown that so many downtowns are aspiring to be," Gabriel says. "As we look at this pipeline between the ambitious footprint of Amazon and this 8,000-unit residential pipeline [ranging from proposed units to buildings under construction], we are going to continue to have that sought-after balance of jobs and residents."

Already, there is a new Metrorail station at Potomac Yard in Alexandria, and Atlanta-based real estate company Cortland has spent \$1 billion to acquire, rebrand and renovate several apartment buildings in Rosslyn, Pentagon City and Clarendon.

At least for Arlington, "the benefits [of HQ2] will still be substantial, even if they are a little slower to materialize than maybe we thought a year ago," Dorsey says.

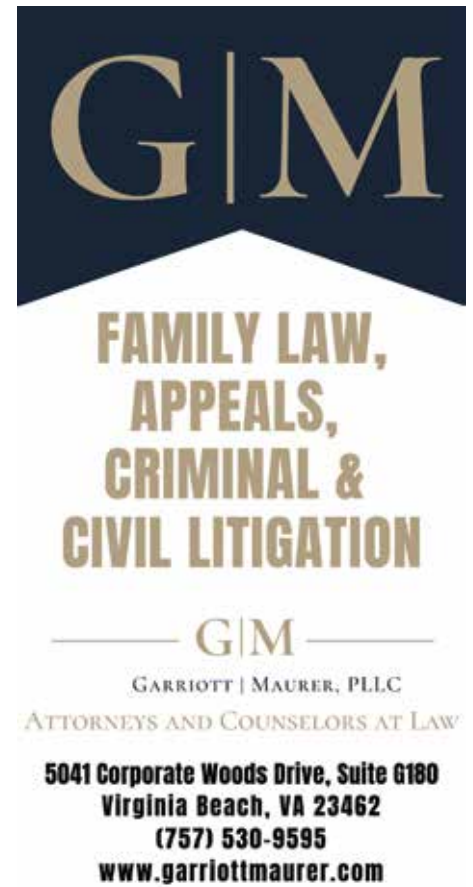
Retailers in the immediate area around HQ2 are expecting a boost as well. One block down from Met Park, Commonwealth Joe Coffee Roasters has already seen an uptick in sales, says Commonwealth Joe co-founder and CEO Robert Peck. Sales increased from an average of 520 transactions a day the week of April 23 to almost 600 transactions a day during the week that Amazon opened Merlin.

"On a nice day, [the park] could be the difference of someone coming to Commonwealth Joe, if they can get their cup of coffee and find somewhere to sit," Peck notes.

Ripple effects

Along with smaller road and bike lane improvements, HQ2's opening coincides with major infrastructure projects, including a pedestrian bridge connecting Crystal City to the Reagan National Airport, which the Arlington County Board approved \$4.2 million to design. The bridge is one of the transportation projects that Virginia agreed to partially fund because of HQ2.

If Amazon decided to stop growing HQ2, the halt might affect some infrastructure improvement timelines, Clower says, but either way, "those are great investments in



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creating walkable, easy commute areas,” that will aid development independent of Amazon.

Also, state economic development officials expect HQ2 and Virginia’s correlating investments in the region and talent, to help Northern Virginia attract more corporate headquarters and tech companies in the future.

“I’m most excited about securing the corporate headquarters of one of America’s most innovative companies in Virginia through a partnership that is not only going to help Amazon thrive in its new corporate headquarters, but that is going to enable Virginia’s people and other companies to thrive,” says Jason El Koubi, president and CEO of the Virginia Economic Development Partnership and a key player in the team that lured HQ2 to Virginia.

Major defense contractors Boeing Co. and Raytheon Technologies Corp. made summer 2022 announcements that they would move their corporate headquarters to Arlington, although it isn’t known if HQ2 influenced either decision.

Amazon is contributing to a change in how people view Northern Virginia, which had long been seen by outsiders as “kind of a government town,” says Victor Hoskins, president and CEO of the Fairfax County Economic Development Authority. As Arlington’s former economic development director, he was a leader in the team that landed HQ2.

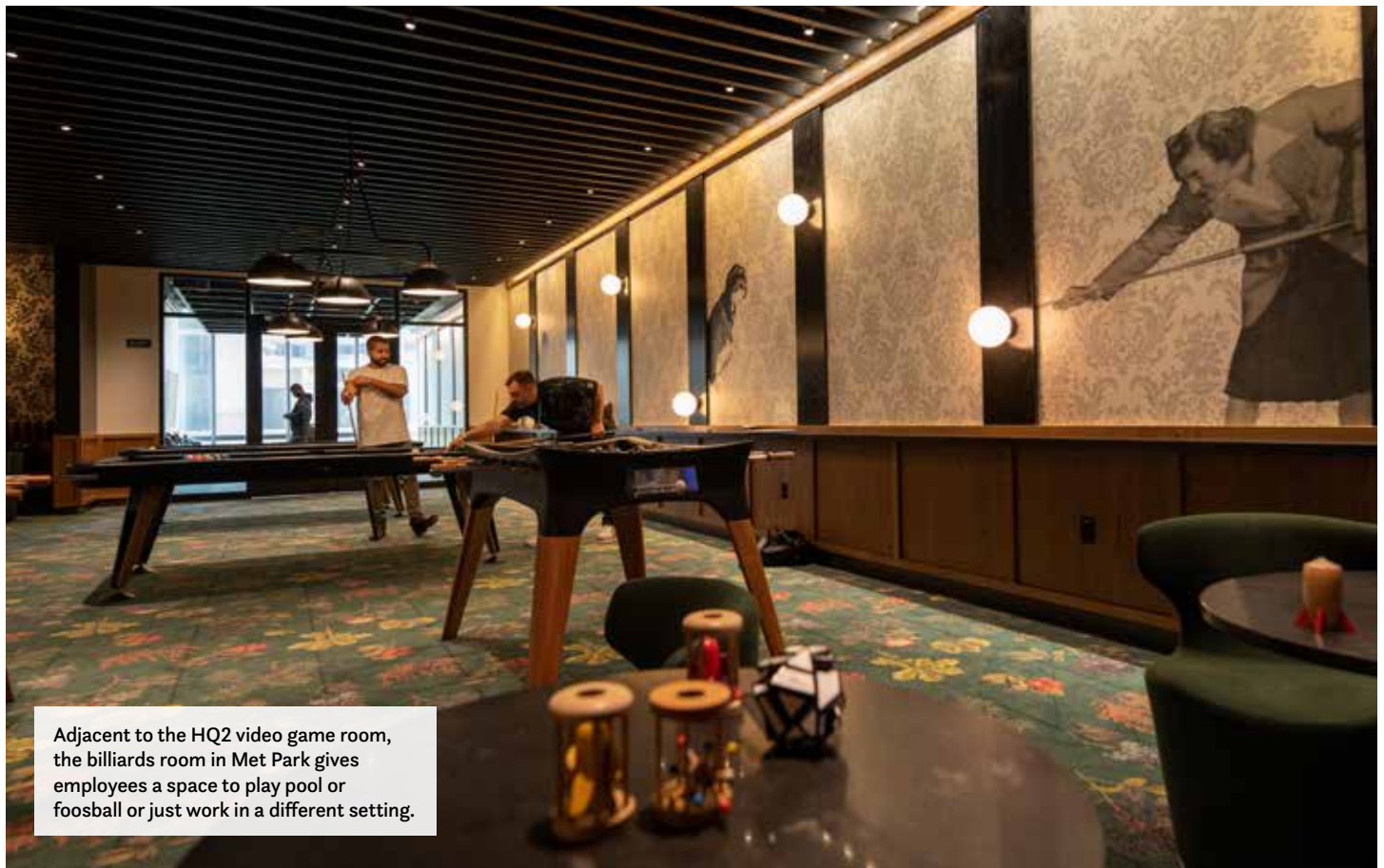
“We’re not viewed that way anymore,” he says. “People view us as a center of technology. They view us as a place of innovation, and I think Amazon had a lot to do with that.” Amazon Web Services and Microsoft Corp. significantly increased their presences in the region in the years following Amazon’s 2018 announcement, and, in April 2019, Google LLC announced it would be the anchor tenant at Fairfax County’s Reston Station office building.

That announcement, combined with other tech company expansions in the area, helped cement the region’s new reputation, Hoskins adds. Also, there’s the higher education component of Virginia’s bid to bring

in Amazon, which the company identified as its biggest motivator for choosing the commonwealth and which will help the state grow its own tech workers.

The state’s Tech Talent Investment Program aims to produce 31,000 in-demand computer science and related graduates in the next two decades. That’s led to the construction of Virginia Tech’s \$1 billion Innovation Campus in Alexandria and George Mason University’s \$250 million Institute for Digital Innovation (IDIA) in Arlington’s Rosslyn-Ballston corridor. Virginia Tech’s classes are already operating in temporary classrooms in Alexandria, and its first academic building, at a cost of \$302 million, is set to open in fall 2024. At its full buildout, the Innovation Campus will produce about 500 master’s program graduates and 50 doctoral candidates annually.

“The state that leads in talent development will be the state that leads in economic development,” El Koubi says. “Virginia is on some very, very solid ground in that respect.” ■

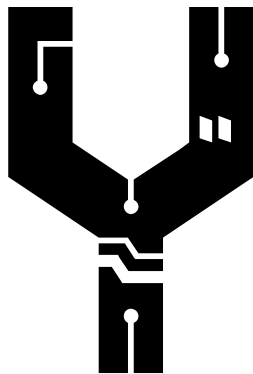


Adjacent to the HQ2 video game room, the billiards room in Met Park gives employees a space to play pool or foosball or just work in a different setting.





The Next Frontier



You come down with coldlike symptoms. Flu season is here, and a new COVID subvariant is circulating. As the illness lingers, you question whether you should see a doctor.

Imagine putting your symptoms into a chatbot connected to your doctor's office or health system that can retrieve your medical records, evaluate your information and recommend next steps.

"It could make recommendations on ... should you be seen by one of our providers in the emergency room? Should you have a virtual visit with a provider? Should you have just a conversation with a triage nurse? Or do you need

to schedule an appointment with a provider?" says Dr. Steve Morgan, senior vice president and chief medical information officer at Roanoke-based health system Carilion Clinic.

Such a scenario isn't science fiction — it exists now, through artificial intelligence-powered tools like Microsoft's Azure Health Bot.

"Although we don't have it now, we're building the infrastructure to be able to employ that type of technology," Morgan says. Carilion has already embraced other AI software, like a dictation system for medical notes.

One year after ChatGPT came on the scene, redefining expectations for AI capabilities, industries have already begun adopting AI chatbots in varying forms, including creating their own models. In this Wild West of rapidly developing tech, companies' workforce training methods range widely, from encouraging employee exploration to structuring rollouts.

Generative AI tools like ChatGPT — AI platforms used to synthesize new data, rather than just analyze data as AI has been traditionally designed to do — are built on large language models (LLMs) that are essentially "glorified sentence completion tools," says Naren Ramakrishnan, the Virginia Tech Thomas L. Phillips Professor of Engineering and director of Tech's Sanghani Center for Artificial Intelligence and Data Analytics.

"They sound so realistic and so compelling because they have been trained or learning on a ridiculous amount of data," enabling the AI engines to learn which words make sense in context, he explains.

**A year after
ChatGPT's seismic
debut, companies
prep for AI**

BY KATHERINE SCHULTE

OpenAI's ChatGPT became a household word shortly after OpenAI released a demo of the conversational AI platform on Nov. 30, 2022. ChatGPT is capable of performing many of the same tasks as human knowledge workers — ranging from drafting emails, business letters, reports and marketing materials to performing paralegal duties, writing computer code, putting data into spreadsheets and analyzing large amounts of data — and it can produce finished work in as little as one second to a few minutes, depending on length and complexity. In March, OpenAI released an updated model, ChatGPT-4, available to subscribers. GPT-4 scored better than 90% of human test-takers on the Uniform Bar Exam, the standardized bar exam for U.S. attorneys.

Generative AI has garnered huge investments. Microsoft has reportedly invested \$13 billion in OpenAI since 2019, and Amazon announced in September that it would invest up to \$4 billion in Anthropic, an OpenAI rival that has also received \$300 million in funding from Google.

In a survey of 1,325 CEOs released in early October by KPMG, 72% of U.S. CEOs deemed generative AI as “a top investment priority,” and 62% expect to see a return on their investment in the tech within three to five years.

Generative AI is developing at a blistering pace. On Sept. 25, OpenAI released a version of ChatGPT that can listen and speak aloud. It's also able to respond to images.

AI is already changing the work landscape, says Sharon Nelson, president of Fairfax-based cybersecurity and IT firm Sensei Enterprises. “It's a bolt of lightning. ... We're seeing it go at the speed of light, and I can only imagine that it will go faster still.”

POWER PLAYERS

As the tech has quickly progressed, large Virginia companies have formally adopted AI tools and are creating standard AI training policies and processes for their employees.

Reston-based Fortune 500 tech contractor Leidos is providing varying levels of training for employees based on their needs, ranging from those who need to build awareness of AI to subject matter experts. Leidos builds curricula with a mix of external courses from suppliers like Coursera and in-house

content, says deputy chief technology officer, Doug Jones.

Like many companies, Leidos is creating an internal AI chatbot, although the company also plans to offer it to customers. The chatbot will focus on IT and software questions, allowing workers to search for answers specific to the firm.

Businesses with troves of documents can easily adapt an LLM to be specific to their documents and processes, Ramakrishnan says: “I'm noticing everybody wants to create their own LLM that's specific to them that they can control. Because they certainly do not want to send their data out to OpenAI.” Because ChatGPT learns from its interactions with humans, information entered into the tool could be shared with another user.

Businesses are also taking advantage of generative AI tools built specifically for their industries.

Virginia's largest law firm, Richmond-based McGuireWoods, is beginning to use CoCounsel, an AI tool designed for attorneys and built on GPT-4 that should allow attorneys to enter client data securely in the near future. Thomson Reuters acquired CoCounsel's developer, Casetext, in April for \$650 million in cash.

CoCounsel has a range of uses, like drafting a discovery response or helping an attorney brainstorm questions for a specific deposition. An attorney preparing to depose an expert witness could feed the tool the expert's published papers and ask it to summarize them or ask it whether the expert has ever taken a position on a particular subject in them, explains McGuireWoods Managing Partner Tracy Walker.

A WIDENING REACH

ChatGPT isn't always a reliable source, as it sometimes can fabricate detailed answers, a phenomenon referred to as “hallucinations.” One attention-grabbing misuse of ChatGPT that demonstrated this problem occurred when lawyers representing a client in a personal injury case against Avianca Airlines cited six fabricated cases as legal precedent, based on research using ChatGPT. A federal judge fined the firm — Levidow, Levidow & Oberman — and two lawyers \$5,000 apiece.

Walker stresses that responsible attorneys will look up and read cases cited

by an AI chatbot, but CoCounsel also provides a safeguard, says Peter Geovanes, McGuireWoods' chief innovation and AI officer: It's been instructed not to provide an answer if it does not know it.

McGuireWoods is taking a two-phased approach to CoCounsel's rollout. The first phase, which started in September and is running through the end of the year, is a pilot program with about 40 attorneys. While Casetext completes its security review of CoCounsel, McGuireWoods' pilot group is using only public data to test hypothetical uses of the tool. Starting in early 2024, McGuireWoods' phase two testing will likely expand to about 100 attorneys.

In the meantime, Geovanes is leading foundational training about generative AI. The firm's first brown bag webinar session was set for Oct. 17. Although the curriculum is designed for attorneys, recordings will be available for any interested employee. McGuireWoods also plans to offer outside courses about the responsible and ethical use of generative AI.

For attorneys selected for the pilot program, the firm will also offer specialized training from Casetext on “prompt engineering” — how to phrase questions to the chatbot to get the desired responses.

In Roanoke and the New River Valley, Carilion is preparing to pilot a new layer of an existing AI-powered transcription tool built for clinicians. The system has used Nuance's Dragon Medical One, which transcribes clinicians' notes as they speak, for “a number of years,” Morgan says.

Microsoft purchased Nuance for \$19.7 billion in March 2022. In March 2023, Nuance launched Dragon Ambient eXperience (DAX) Express (now DAX Copilot), which is based on GPT-4. It listens to a clinician-patient conversation and drafts clinical notes seconds after the appointment. Morgan hopes to begin piloting DAX in the first quarter of 2024. Because they've used Dragon, practitioners likely won't need much training to adjust to DAX, he says.

Additionally, Carilion is participating in a pilot test of an AI component in the MyChart patient portal offered by Carilion's electronic medical records vendor, Epic. The AI tool is designed to draft responses to patient questions sent through the portal,



McGuireWoods is providing training on AI basics, ethical use and prompt engineering, says Peter Geovanes, the firm's chief innovation and AI officer.

taking into account a patient's medications and medical history. Six Carilion practitioners are participating in the pilot, which started in September, receiving on-the-fly training from Epic and providing feedback.

EXAMINING NEW TERRAIN

Smaller Virginia companies with fewer resources seem to have taken a more cowboy approach to the new AI frontier, setting ground rules before encouraging employees to explore generative AI tools on their own.

Will Melton, president and CEO of Richmond-based digital marketing agency Xponent21, is also leading a regional work group focused on preparing Richmond's workforce for AI. Xponent21 initially used Jasper, an AI software tool for writing and marketing, but the firm now uses ChatGPT

for tasks like information analysis and developing initial copy, which then goes through human editors.

"I think that the biggest thing that these tools give us is freeing up time that is ... spent on monotonous activities that don't have a lot of value," like helping employees spend less time writing social media posts or blogs and more time speaking with clients, he says.

Ben Madden, board president for the Northern Virginia Society for Human Resource Management, has begun using ChatGPT in his HR consulting work, asking the AI tool to draft job descriptions and synthesize information for presentations and policy documents.

"Having it be able to do tasks that may take longer without having the support

of supercomputers behind it is where I continue to probably see it being used and being able to make my life easier as either a business owner or even for my clients," says Madden, whose one-person consultancy, HR Action, is based in Arlington County.

Another Richmond-based business beginning to adopt AI is accounting firm WellsColeman, which updated its internet acceptable use policy to include guardrails for AI and ChatGPT usage, like prohibiting employees from entering client data into the platform.

Nevertheless, the firm has encouraged its employees to get familiar with ChatGPT, says Managing Partner George Forsythe. In full firm meetings, leadership will sometimes demonstrate how they've recently used ChatGPT, and staff can ask questions or discuss possible uses.

"We're using [ChatGPT] as an initial step in gaining familiarity with areas that are not part of our everyday expertise. It's an easy way to get a broad brush on any topic area," says Forsythe. After verifying the information given, staff can use it as a starting point for their research.

Forsythe has consulted ChatGPT with general management questions like how to communicate with an employee having leadership challenges and has also used it as a marketing aid.

"When it comes to selling our services, I've asked it to put together a proposal and make it intriguing and have a hook," Forsythe says, and he's been pleased with the results.

Similarly, Winchester-based accounting firm YHB is using generative AI tools for marketing questions that aren't firm-specific.

"Our team uses [ChatGPT] a ton to help understand and interpret tax laws and information like that," says Jeremy Shen, YHB's chief marketing officer. They'll also ask the chatbot if a website post will have a high search engine optimization score.

The firm is working on selecting an AI tool to formally implement, whether ChatGPT Enterprise, Microsoft's Copilot or another. For now, "we just kind of said, 'We know you're using it. We know people are using it. Here's some guardrails ... but discover and let us know if you come up with something useful,'" Shen says.

THE NEW STEAM ENGINE?

Out of 31,000 people surveyed across 31 countries, 49% are worried that AI will replace their jobs, according to a Microsoft survey released in May. That same month, a CNBC/SurveyMonkey poll found that 24% of almost 9,000 U.S. workers surveyed are worried that AI will make their jobs obsolete.

It's not an unfounded fear. In 10 years, AI automation could replace about 300 million full-time jobs, according to a March report from Goldman Sachs researchers, but it could also raise the global GDP by 7%, or nearly \$7 trillion. In May, IBM CEO Arvind Krishna said AI could replace up to 7,800 jobs — 30% of the company's back-office workers — over five years.

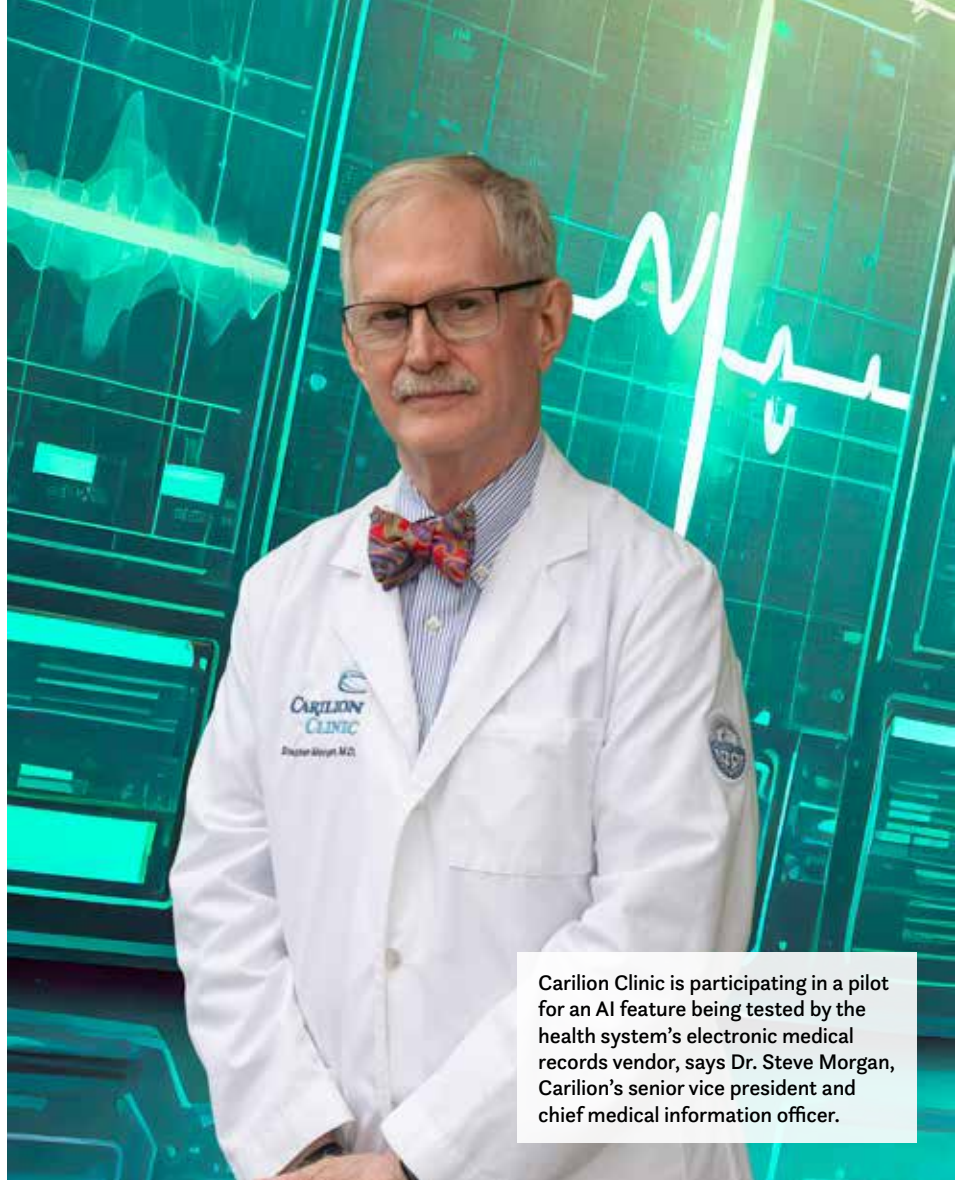
A refrain commonly heard among AI's proponents is, "AI won't take your job, but someone who knows how to use AI will." It's paraphrased from a statement made by economist Richard Baldwin, a professor at the International Institute for Management Development, during the 2023 World Economic Forum's Growth Summit.

"I see some paralegals perhaps being replaced by AI, and only some, because there are some paralegals that have other advanced skills as well," says Nelson with Sensei Enterprises, who is also an attorney and former president of the Virginia State Bar. Lawyers who do simpler tasks like drafting wills or divorce contracts might be vulnerable to being supplanted by AI, too, she says.

Comparisons to prior technological advances abound. "When the world switched from horse-drawn transport to motor vehicles, jobs for stablehands disappeared, but jobs for auto mechanics took their place," Federal Reserve Board of Governors member Lisa D. Cook said in a September speech at a National Bureau of Economic Research conference. Workers' adaptability will depend on their "portfolio of skills," she said.

Supporters say AI will make employees more productive, which can help industries weather labor shortages and let workers put aside rote tasks to focus on higher-level work, which could increase their job satisfaction.

In the world of government contracting, the constraints on some workers, like getting



Carilion Clinic is participating in a pilot for an AI feature being tested by the health system's electronic medical records vendor, says Dr. Steve Morgan, Carilion's senior vice president and chief medical information officer.

security clearances and working in-person in a classified environment, can make hiring difficult, says Leidos' Jones.

"We actually find sometimes we can take some of the tasks that are not as engaging for our own employees [like data entry] ... off their plate, and they can spend more time doing the things that are really powerful and unique to humans," he says.

Forsythe also sees AI as an aid to staff: "Right now, the war is for talent. ... If we can't find more people, one of the things we can do is try to change their roles ... and support them in manners that make their jobs easier, not so that way they'll do more work, but so that way they remain part of the firm and don't feel overburdened," he says.

Or it could just improve workers' quality of life. In an early October interview with Bloomberg Television, JPMorgan Chase CEO Jamie Dimon predicted that time savings from AI could result in a universal 3.5-day

workweek — though he also said that he anticipates that AI will result in lost jobs.

While AI will eliminate jobs, it will also create them, experts say. The Washington, D.C., region had almost 1,800 listings for AI-related jobs at the end of August, according to Jones Lang LaSalle. Leidos and Boeing were among the companies with the most openings for AI positions.

New roles are emerging, like "prompt engineers" who develop and refine prompts or queries for AI tools to get the most valuable and appropriate responses. At the end of September, OpenAI rival Anthropic was seeking a "prompt engineer and librarian" hybrid position in San Francisco with a salary range of \$250,000 to \$375,000.

"The people who study the future of work, they say that certain jobs will go away," Ramakrishnan says, "... but then there will probably be new jobs created that we don't know yet." ■