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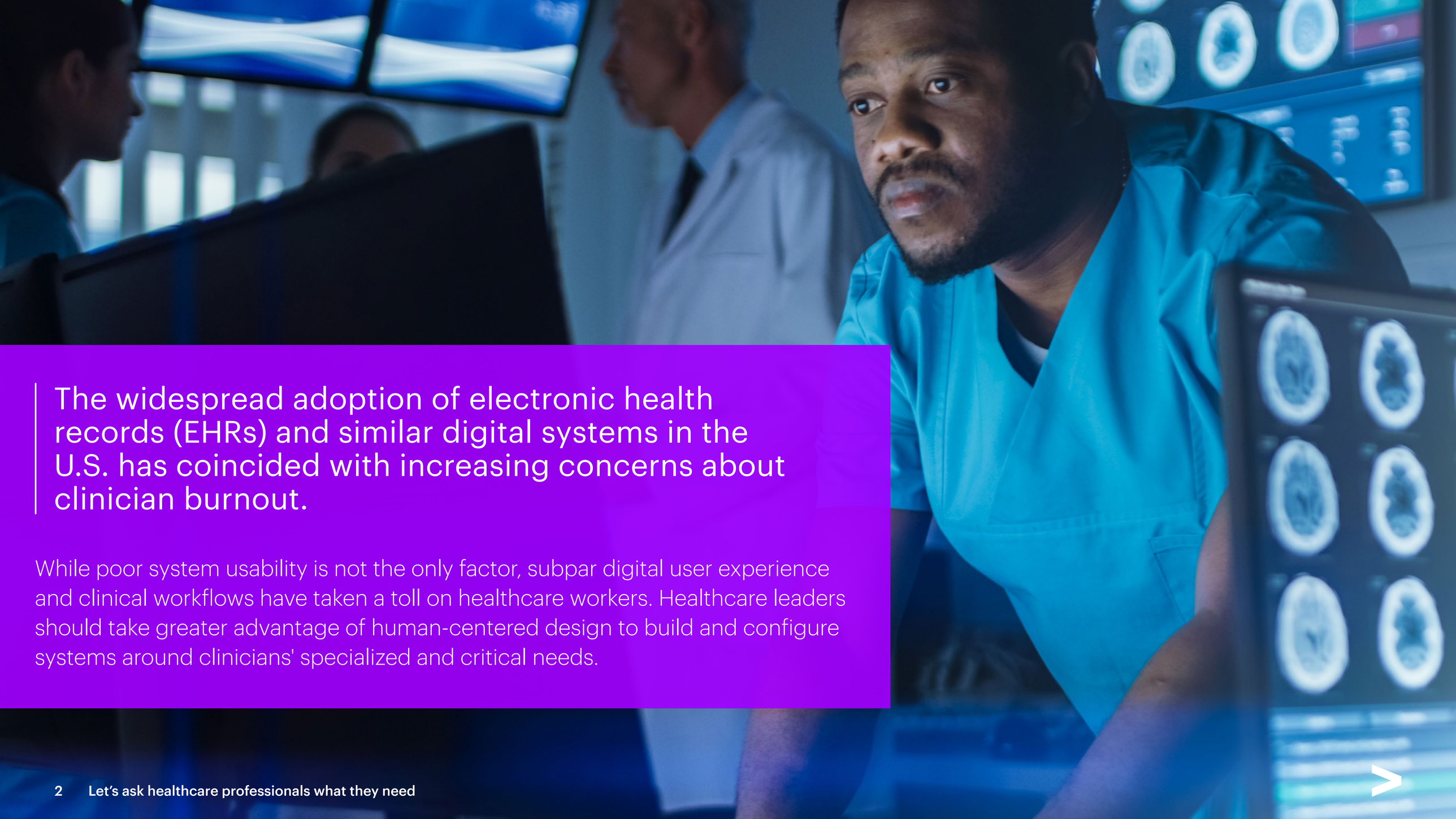
Let’s ask healthcare professionals what they need

The case for human-centered design in clinical applications and workflow



> The widespread adoption of electronic health records (EHRs) and similar digital systems in the U.S. has coincided with increasing concerns about clinician burnout.

While poor system usability is not the only factor, subpar digital user experience and clinical workflows have taken a toll on healthcare workers. Healthcare leaders should take greater advantage of human-centered design to build and configure systems around clinicians' specialized and critical needs.

Electronic health records drive clinical stress

> If you ask healthcare workers how they're doing, after navigating through a global pandemic for more than two years, most will tell you the same thing. They're suffering. They might use different words—frustrated, exhausted, overwhelmed, anxious, frazzled—but the overall sentiment is universal. It's called burnout.

Of course, even before Covid-19, many clinicians reported experiencing systems of burnout, with the majority citing **bureaucratic tasks and long hours** as the primary reasons for it. It makes sense: Doctors, nurses, and other frontline employees have a passion for taking care of people, yet they must do that job in an extremely fast-paced, high-pressure, high-stakes, high-stress environment. They operate in a culture of distraction, with interruptions and emergencies constantly coming up. They share common spaces and are frequently moving around from one patient to the next.

They barely have time to take a lunch break, not to mention attend professional or technological training. They spend increasing amounts of time in front of screens, because data is more critical than ever, but that screen time can take away from their face-to-face time with patients.

In the worst case, they also know that careless errors and inefficiencies can cost lives—and in other cases, they cost time and money. **Alert fatigue** is a real issue. Plus, now, they're dealing with pandemic-related challenges like **supply chain hurdles, capacity constraints**, and **labor shortages**.

Still, even **during the pandemic**, top complaints among healthcare professionals are related to their ongoing struggles with using digital interfaces like **electronic health records (EHRs)**. Clinicians have been using variations of EHRs—and complaining about them—for almost 20 years. For example, the **Mayo Clinic studied EHR usability** in 2017-18 using a standard assessment methodology and found that the majority of clinicians gave EHRs a failing or non-acceptable grade. Specifically, the EHRs received a System Usability Scale (SUS) rating of 45.9; by comparison, Google search enjoys a 93 rating.

The study also found a positive correlation between improved usability and reduced odds of clinician burnout.

Fast forward to today, and surprisingly little has changed. While technology dramatically accelerated with advances in the use of things like telehealth appointments, AI chatbots, and even virtual reality applications during the pandemic, significant innovation still hasn't come to the basic design, development, and implementation of tech platforms like EHRs and other digital interfaces. Why? Because too often, these interfaces and systems are inherently not human-centric.

Maybe they were designed to collect data, but to what purpose? Perhaps they were intended to ease billing, but they certainly weren't designed with the primary users in mind (i.e., clinicians), and they often weren't built for customization or modification, which is necessary as different physicians have different needs.

If we want to solve clinicians' burnout, we need to start by talking to the clinicians and co-creating solutions with them. We need to apply human-centered design approaches in developing clinical applications and workflow.

How human-centered design can help

With clinicians spending one to two hours on administration and data entry for every hour spent with patients, the need to improve the effectiveness of this time has never been greater. This is especially true as more immersive consumer experiences raise their expectations while the amount of data and information they need to navigate grows.

In its landmark study, ***Taking Action Against Clinician Burnout: A Systems Approach to Professional Well-Being***, the National Academies of Medicine (NAM) advised:

1. Redesigning clinical systems focused on activities that 1) patients find important to their care, and 2) enable clinicians to provide high-quality care;
2. Implementing interventions that target known system factors affecting clinician burnout and professional well-being at the systems level; and
3. Making a sufficient commitment to allocate the appropriate infrastructure, and resources—and to build a culture of accountability that supports clinician well-being.

To implement this approach, NAM further advised that leaders:

> "...engage clinicians in the design and deployment of health IT using human-centered design and human factors and systems engineering approaches to ensure the effectiveness, efficiency, usability, and safety of the technology."

So, what is human-centered design, and how can it help?

Human-centered design applies design thinking principles, which focus on learning and discovery, to solve the real-world challenges of everyday people. Given that individuals often don't fully recognize their limitations or where they need help, it also emphasizes contextual observation to understand specific needs, challenges, and potential solutions.

With a broad objective or desired outcome in mind, design thinking teams work iteratively to better understand constraints and requirements and then to create, test, and improve potential solutions.
Over the past decade, design thinking has established itself as a powerful problem-solving approach for developing new ideas and fostering innovation. It helps users answer "what if" questions and explore the "art of the possible" in detail. This makes it especially well-suited for solving complex challenges with unknown interdependencies.

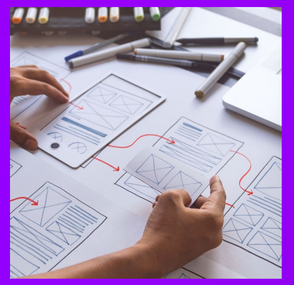
So for clinicians, specifically, a human-centered design approach can help create more effective, powerful user experiences that empower, inform, and guide them to provide better patient care. It is a response to solutions, technical and otherwise, that fail to reflect and address specific user needs. It champions usability, intuitiveness, and empathy in designing solutions that empower users. Underscoring this priority, some institutions are adding it to their health administration curriculum, including the **University of Texas' Master of Design in Health** program.

In other words, we essentially want to understand what individuals care about, so that we can create better experiences for them. We want to learn what people are trying to accomplish when they come through the doors—whether they come in physically or virtually, and whether they come as an employee, a patient, or a family member. We want to understand who interacts within a system, and how those people behave within the constructs of a system. We want to make sure that when we're designing something new, we have people's best interests in mind, so that we can deliver services and systems that incentivize good decision-making and a good experience. After all, people are at the heart of healthcare. So when we think about building the future of healthcare, we have to prioritize the value we provide to healthcare workers, who in turn provide value to patients.

The methodology of human-centered design is:

Co-creative
Engaging customers and stakeholders throughout the process;

Integrated
Drawing on the best practices and thinking from many disciplines; and



Experiential
Creating experiences, visual artifacts, and tangible prototypes to bring the cutting-edge vision to life

Data-driven research plays a critical role in human-centered design. Whether qualitative or quantitative, data-driven research enables a more holistic understanding of current experiences and opportunities to design more effective experiences in the future. It also defines the baseline as well as the aspiration or future state. As such, these insights support the process of testing, proving, and refining hypotheses.

To do this work, we use a combination of research methods. Typically, we start by conducting ethnographic research in the field, which allows us to witness things going on and talk and interact with users. While this can be difficult in healthcare settings, due to privacy and safety concerns, it's not impossible. We also conduct surveys, one-to-one interviews with users, small group discussions, and collaborative workshops.

By reviewing and analyzing the data, both qualitative and quantitative, we then work on designing solutions, often collaboratively sketching ideas on a whiteboard with our users, then testing and iterating until we have solutions that people are excited about.

The future of health will be increasingly digital, data-driven, and preventive. Disrupters like One Medical and Parsley Health are already reimagining how to deliver care in more data-driven, personalized, and holistic ways, and they're focused on providing better user experiences for both patients and clinicians. But these bespoke boutique offerings remain expensive, making them inaccessible for too many people. To make innovative clinical solutions more equitable and accessible, we need to use a human-centered design approach at scale, as it is commonly **used in business**.

Now is the optimal time for federal health agencies to rethink how they work, aiming to add value for patients by first creating better user experiences and value for clinicians. The disruption of the pandemic and subsequent growth in telehealth have brought new digital innovators into the mainstream market that are raising expectations for all. For example, the **Department of Veterans Affairs took a human-centric approach and successfully accelerated the use of virtual health during the pandemic**. As more organizations realize the need to address the pressing challenges they're facing in the healthcare space, whether related to clinical workflows or applications, human-centered design is going to be increasingly critical.

Clinical processes' reliance on rule-based workflow adds inefficiencies and frustration

> In addition to clinical burnout, another big issue for healthcare providers is alert fatigue.

Specifically, overly sensitive EHRs often give warnings for a host of issues, such as potential drug interactions or extraneous process updates. The challenge is that these alerts can be false positives, leaving clinicians to either ignore them, and risk patient safety, or spend time investigating what's likely a phantom issue.

The underlying issue is that many systems rely on simple rules — essentially binary decision-making — in issuing alerts and recommendations. These rules are often limited in the amount of context that they can address (for example, a patient's weight or condition) in coming to their conclusion.

But now, with the increasing maturity of artificial intelligence and machine learning, we can apply human-centered design to rearchitect these systems to take on more contextual analysis and provide more nuanced guidance. While humans will ultimately make decisions, shared authority with semi-autonomous or closed-loop systems can yield predictive, actionable insights, such as anticipating a cardiac event 30 to 60 minutes before it occurs.

Four ways to successfully apply human-centered design in the clinical environment

> Imagine you're a doctor, nurse, or other frontline healthcare worker. When you get to your office, it's likely bright, illuminated by fluorescent lights, and it's probably loud, with intermittent beeping from machines and other people's voices. You're immediately confronted with colleagues asking you questions or patients explaining their symptoms. Perhaps you try to sit down at a computer to start entering a patient's data when you're suddenly interrupted by an emergency.

When we design for the clinical environment, we have to remember who we're designing for and where and how they work. Based on our experience in the healthcare space, these are the four most important things to consider when applying a human-centered design approach. If you keep these recommendations in mind, you'll be prepared to deliver real value to clinicians, and in turn their patients, by saving them time, increasing their accuracy, and improving their job satisfaction.

1 Design digital interfaces with clinicians' physical reality in mind.

To fully understand the way clinicians work, you need to immerse yourself in their environment. It's often a noisy, crowded space, with new people coming in and out all day and night. There are constant interruptions, distractions, and emergencies. Time is precious, and the patient is always the priority. In that kind of physical space, one of the best ways to add value for clinicians is to make their routine tasks as easy and efficient as possible. To do that, you need first to observe people at work and ask questions about what challenges they face. Then strive to create simple, user-friendly systems for data entry. Embrace step-centric, sequential designs. Build interim and automatic save functionality into all your applications. Make it simple for users to pick up from wherever they left off. Integrate real-time data sources, and be mindful of alert fatigue.

2 Align clinical processes with healthcare workflows.

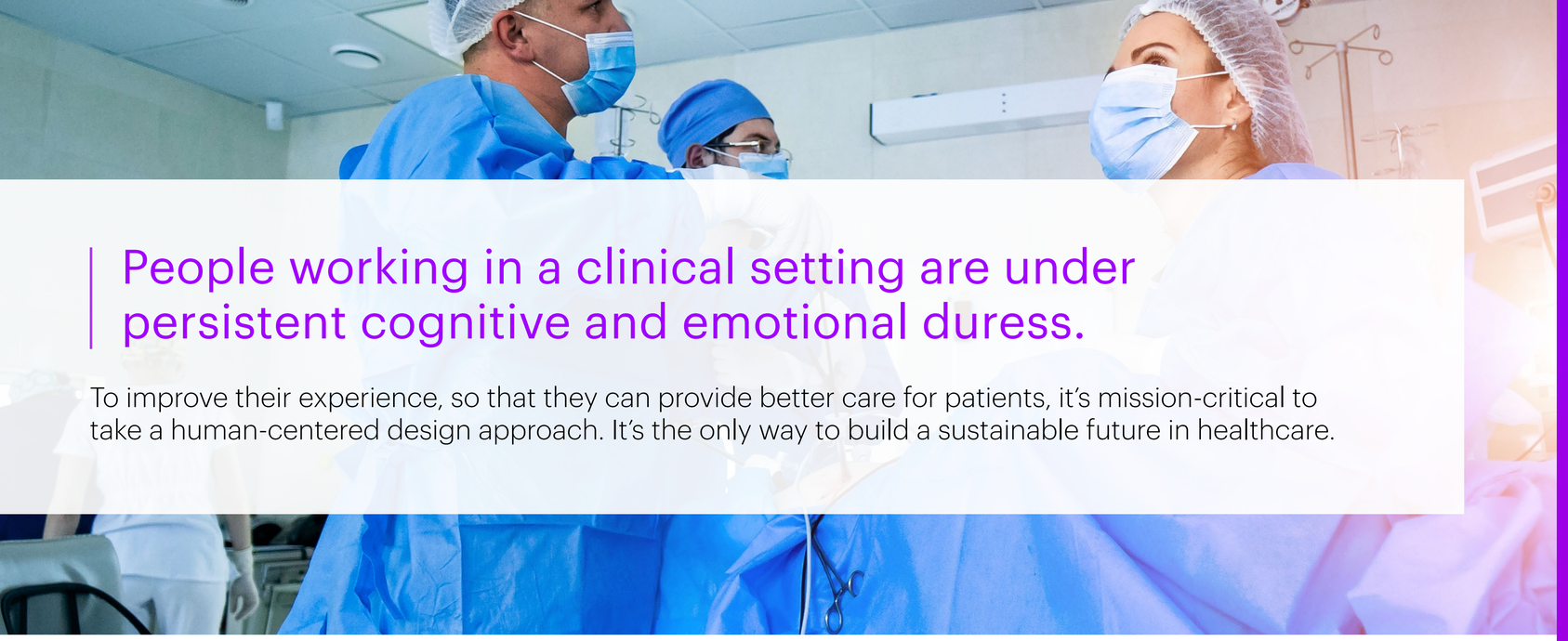
Different doctors in different offices have different ways of doing things. With that in mind, when applying human-centered design, it's vital to balance everyday needs with bespoke needs — for both cost-effectiveness and to support less learning burden for transient employees. For example, you may need to create a single experience that streamlines commonalities while allowing for bespoke data-entry needs.

3 Move slowly, and offer incentives to participate in training programs.

Healthcare professionals often worry that significant change will be disruptive—to their standard ways of working and, in turn, to their patients' care. They also commonly feel hesitant about taking time away from patients to attend training. To help alleviate these valid concerns, change should not come all at once in the clinical environment. It's better to deliver small and incremental changes slowly over time rather than release a major transformation at once, which could cause real disruptions. It may also help to offer incentives that encourage people to participate in training programs, again at a manageable pace, without rushing anyone.

4 Be flexible, and be patient.

It's wise to expect the unexpected when working with doctors, nurses, and other frontline healthcare professionals. When scoping a project, allow extra room in the timeline for delays. You may need to reschedule site visits, interviews, and workshops. Whenever possible, we recommend conducting research in person. But that's not always possible, and as we've realized in the past two years, more can be done virtually than we previously realized. Stay curious and creative throughout the process.



People working in a clinical setting are under persistent cognitive and emotional duress.

To improve their experience, so that they can provide better care for patients, it's mission-critical to take a human-centered design approach. It's the only way to build a sustainable future in healthcare.

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