

The changing face of medical-device design

Design can help craft a standout patient experience. Here, three leaders discuss how the discipline is improving medical products and driving innovation.

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The boundaries between drugs, medical devices, software, and patient data are blurring. Patients expect Amazon-level service in all aspects of their lives; physicians need data from multiple sources to be brought together in one place; and payors seek better real-world outcomes and lighter financial burdens. These trends are converging to make design a CEO-level topic for pharmaceutical and medical-device companies. Without first-in-class design, it is difficult to make a product—and, more importantly, a patient experience—that stands out in an increasingly crowded market.

McKinsey's Thomas Nilsson and Benedict Sheppard spoke with three leaders to see how they are using design to tackle these challenges. Steve Eichmann is responsible for design and usability across the Johnson & Johnson Medical Devices Companies; Henrik Norström is the COO and deputy CEO of BrighterAB, a global mobile health tech company dedicated to innovative design; and Sebastian Liedtke has led a digital-design transformation at Roche Diabetes Care for the past four years.

McKinsey: *How would you describe today's medical-device landscape?*

Steve Eichmann: Although external pressures are changing market dynamics, quality remains paramount. The decision power that used to lie with surgeons is now shared with hospital executives. In addition to ease of use, clinical efficacy, and safety, they are looking for better outcomes, lower costs, and patient satisfaction. To meet these needs, designers and usability experts are trying to reduce device complexity and variability and improve their reliability, patient outcomes, and overall performance.

Henrik Norström: Patients expect more from their products today because they are accustomed to rapid innovation in their lives as consumers. Companies like Google and Netflix constantly deploy the latest technologies to improve the customer experience.

Patients rightly expect similar levels of innovation and service from medical products as well. Additionally, an aging population means that more and more patients are living with comorbidities that complicate their care.

Sebastian Liedtke: Data availability is growing at an exponential rate—data for patients, for physicians, and for manufacturers. As an industry, we have to get better at using that data to its full potential by integrating it into new therapeutic concepts to improve outcomes for patients. At the same time, we need to ensure we comply fully with data-privacy laws and regulations.

McKinsey: *What are the obstacles to achieving the level of design and innovation you want to see?*

Sebastian Liedtke: Historically, many medtechs have been technology-centric rather than user-centric. As a result, they are structured in tech silos: mechanical, electrical, software, and so on. Each of these silos has optimized its own individual part rather than addressing the entire patient journey.

Steve Eichmann: Data capture is not systematic, and data systems are fragmented. Take medical records, which can be collected and stored in many different ways. This creates unnecessary complexity for both patients and hospitals. With this patient and hospital data,

**What is design?**

Like “strategy” and “analytics”, design is a term that suffers from misuse. Design is not just about making objects pretty. Design is the process of understanding customer needs and then creating a product or service – physical, digital, or both – that addresses their unmet needs. It sounds simple, but it’s actually a high bar: the design must simultaneously achieve functional utility, emotional connection, and ease of use, while fitting into customers’ broader experience.

we could generate insights that enable better quality of care and better and more consistent patient outcomes. Yet often this information is stored on a host of separate databases so that it’s impossible to access or analyze the data in its totality.

Henrik Norström: The problem with medtech is that it’s highly traditional. If you look at industries that are user driven, people are getting stuff they like from day one—but medtech has never been that way. What’s more, product development follows a traditional waterfall approach that serves only to exacerbate one of our biggest challenges: lead time from idea to market.

Steve Eichmann: In the past, some device companies assumed that complying with user-testing regulation and guidelines was enough to make them user-centric. That might have been true up to a point, but laws and regulations don’t help you keep pace with design innovation, usability, software development, or technology advances.

Henrik Norström: Of course, we follow guidelines as well as challenging them. But FDA guidelines are driven by historical facts; they always lag a step behind. We have to follow 36 standards, sometimes more. The challenge is pushing the regulatory bodies to review the guidelines. Given their dependence on past data, they too face a challenge in knowing where to draw the boundaries in future.

McKinsey: *What can organizations do to embrace design and meet these challenges?*

Steve Eichmann: First and foremost, put the patient at the heart of what you do. The burden of the disease is what to look at—the full patient experience, not just the direct symptoms. That means mapping out a patient’s day from morning until night and understanding all the pain and frustration that the disease state can bring. If you focus too narrowly on your device or drug, you’ll miss opportunities.

It also means thinking about all stakeholders: not just the patient, but nurses, physicians, and family members. If nurses are working with our products all day long, we want to design the user experience to be a positive one, rather than something to dread. All at the same time as delivering results for the patient and improving clinical outcomes.

Sebastian Liedtke: All this takes a lot of time. Getting closer to patients means conducting a full range of ethnographic research using techniques such as focus groups, home visits, and family interviews, as well as using quantitative techniques such as warranty-claim analysis. For one recent study, we spent months conducting 25 in-depth quantitative interviews in two countries, followed by engaging 600 participants in a qualitative online survey to see how users interact with our product.

Henrik Norström: Team setup is also critical in adapting to the new world we live in. You need cross-functional product design teams—not virtual but actual—working side by side and reacting the minute new information comes in rather than waiting for a meeting. It used to be that we provided one engineering piece of the jigsaw, but then we realized that one piece didn’t solve the puzzle. Now we’re trying to understand what the real problem is and how we can design a solution together.

Sebastian Liedtke: The timeline of involvement is important too. No matter what the program or opportunity is, we need to include design experts in the first team we bring in to understand the landscape. Their job is to follow the product from concept to launch and right through to the end of its lifecycle. They act as the voice of the user, which must be present throughout the whole process.

Steve Eichmann: Many companies could benefit from moving their development processes beyond the traditional V-shaped waterfall model. That doesn't mean descending into chaos. You still need robust stage-gates with clear "pass or fail" criteria and strong leaders who don't let weak projects progress. However, for in-between stage gates, it's important that designers can work fluidly, iteratively, and creatively rather than ticking boxes in a bureaucratic process.

Henrik Norström: Companies can use metrics to bring science to the art of design. For example, we try and reduce the number of steps a diabetes patient has to take to manage their disease. A typical process—measuring your blood glucose, logging the data, and so on—takes 28 steps, but we've managed to reduce that down to nine. And those nine are at a level where a patient's perceived cognitive resistance is lower, and they are less aware of being sick.

Sebastian Liedtke: As well as being core to each team, design needs to have a voice in the C-suite to give it the importance it deserves. Design leaders should present their progress with the same rigor with which COOs present their production performance or CFOs present their budget.

McKinsey: *What challenges lie ahead?*

Henrik Norström: We still need to see reduced development timelines; I'm working on that a lot. I think we'll benefit from the new opportunities for continuous digital interaction with patients. Feedback from a large population of users can be fed directly into the next generation of products, reducing both design research and regulatory timelines.

Sebastian Liedtke: Design now focuses on the whole treatment process rather than one aspect of it, so designers need to understand the entire patient journey from the perspective of every user: patients, clinicians, and nurses. This will put a premium on finding and training teams with cross-functional skills.

In the field of industrial design, we see growing demand for products to become smaller, more integrated, more discreet, and more connected. That's a trend that started in fast-moving consumer goods. But unlike that industry, producers of medical solutions must comply with regulations, and it will be challenging for us to keep up with the pace they set.

Steve Eichmann: Design is an art with a science to it. Usability is a science with an art to it. The two are inextricably linked. Defining usability is critical, and so is ensuring we are always solving for the right thing.

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