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How low-demand design is poised to triumph in home health



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Necessary Change

Prior to 2020, our world was already on a clear path toward increased connectivity in healthcare, as the near ubiquity of the internet paired with novel technologies allowed patients to self-educate, self-advocate, and self-care more easily than ever before. Caregiving for a loved one became less intimidating, though perhaps no less difficult. Yet as with any change, the affordances technology provided were met with skepticism. We had never done things like this before; we couldn't always predict precisely whom the changes would affect, and when we could, we had to acknowledge that—as when any new technology arrives on the scene—some people in the current system stood to lose out, even as startups, clinicians, and patients were poised to benefit substantially.

Then, of course, Sars-CoV-2 made its way across the globe, and our hesitance to adapt was steamrolled by the reality that adaptation had become a necessity. Six months into the pandemic, television ads and billboards encouraged people to use telehealth and to test themselves for COVID-19 and other disease states from home, as well as to return to hospitals and doctor's offices (following safety protocols) for routine screenings and treatments. So much of this pandemic was unknown, and so impoverished was the infrastructure to navigate it, that the potential risks of having patients responsible for their own diagnoses and care were outweighed by the burden their home care could remove from healthcare and government systems.

The Challenge of Increased Agency

Along with increased access to care and new-found levels of agency come an increased cognitive burden. Patients aren't simply being asked to comply with or adhere to treatment plans, they're being asked to procure necessary supplies, carry out medical procedures (e.g., sample collection), and determine whether the procedure was successful.

This is where the primary challenge of designing medical devices for home health and self-care comes in. One of the reasons the FDA requires usability evaluations for medical devices is that the human brain is not good at monitoring its own activity (i.e., metacognition). Even highly trained clinicians don't always know when they've made a mistake. And unlike clinicians, patients don't have the added safety nets of strict protocols or experienced peers to provide support. All the patient is certain to have is the device and its instructions.

For this reason, it's imperative that the considerations for home health kits go beyond a friendlier looking package or an icon-heavy quick reference guide. To be successful, home health kits must be designed to take on a surprisingly complex set of objectives, including preventing errors, providing feedback, communicating status, alleviating stress, integrating into "regular life", and instilling confidence in the outcome. If the patient isn't confident that they did everything correctly, they won't trust the results, lowering the likelihood of compliance with recommendations based on those results. What home healthcare requires is considerate design that asks less, so patients can do more.

Home Health Research and Low-Demand Design



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In order to make a kit, device, or system that asks very little of patient users, you need to conduct well-designed studies. But study design in the early stages of product development is far from a one-size-fits-all model. The type of study you conduct depends on the questions you wish to answer. The type of questions you hope to answer are determined by your goals, both short- and long-term. A thoughtful study might be designed to identify realistic use cases, determine intended user groups, unearth common mental models, assess the successes and failures of competitors, and establish a set of user needs.

In addition to business strategy and development timelines, the output of the research should include a set of actionable, non-prescriptive, affordances, such as "The user should be able to open the sample chamber with one hand," or "The device should be able to alert the user when 20 minutes has elapsed." These data-driven recommendations create a set of system features that combine to facilitate the seamless, low-risk patient experience we should be striving for.

Of course, there is no single home health problem to solve; the problems at hand change based on the type of kit or device, and the variables surrounding each system are vast. However, the common threads of home health allow us to approach highly variable problems using one guiding principle: low-demand design.

Low-demand design is a catchy way of saying that the design of any device should minimize the burden to the user's finite resource systems, both cognitive and physical. When approaching problems with low-demand design in mind, we still leverage the data we collect during research to inspire potential solutions. But from there we refine and implement solutions that free up users' cognitive, emotional, and physical loads. With less to think about and less to do, we increase the likelihood of user success and improve the effectiveness and reliability of home health systems.

The next decade will yield thousands more medical devices intended to be used by patients in their home environments. Competition will be strong and opportunities great. Organizations that move beyond dressing up traditional sample kits with a home health aesthetic and instead craft deeply intuitive, low-demand systems will distinguish themselves from their peers. It's the companies that invest in this type of design that will have a lasting impact and exert the greatest positive influence on the patient's role in healthcare.

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