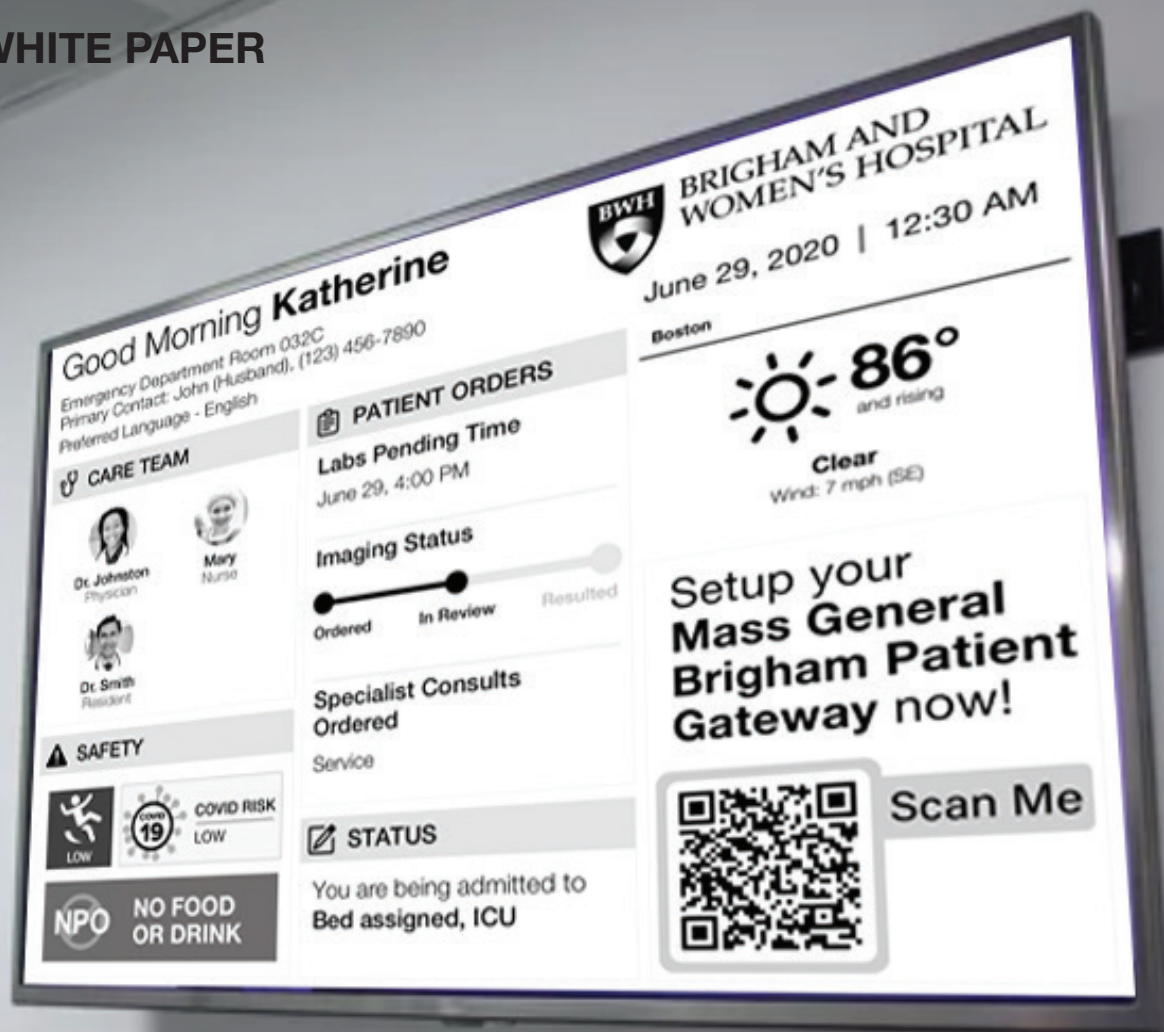


## WHITE PAPER



# The Digital Whiteboard: A sign of improved patient comfort and satisfaction.

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The typical hospital Emergency Department (ED) is a hectic, fast-paced and stressful environment. New patients are constantly arriving with urgent complaints, from chest or abdominal pain to potentially fractured bones, while clinicians rush to find answers.

Nurses triage patients. Specialists are called in. X-rays or other tests are ordered, stat. Meanwhile, the clock is ticking. And in the center of this maelstrom are patients, and their families, simply wanting to know what's going on.

Caregivers do their best to provide new information as rapidly as possible. This is a challenge on any given day and even more so now during the pandemic when moving in and out of rooms may require donning specialized personal protective equipment.

One communication medium proven to be helpful is the patient whiteboard, a simple display that's traditionally been updated by hand. Dry erase whiteboards have been shown to improve patient satisfaction<sup>1</sup> and their use is recommended by the Joint Commission.<sup>2</sup> There's just one problem, and it's a big one. Nurses are usually too busy to update them (and pens go missing<sup>3</sup>), so they remain largely unused. This results in patients being left in the dark—unaware of critical information such as who is on their care team and what's going to happen next. This can be a recipe for anxiety that runs counter to the desire to comfort patients when they are at their most vulnerable.

Research by the International Journal for Quality in Healthcare determined that “patients receiving emergency care described comfort in terms of feeling safe, cared for and able to relax.”<sup>4</sup> If patients are in a knowledge vacuum regarding their care, relaxation is elusive at best.



How patients feel in the ED and their level of satisfaction with the overall experience matters now more than ever. Today's consumers rely heavily on patient reviews and peer feedback for their decisions.<sup>5</sup> Having higher satisfaction scores and positive reviews can give hospitals a competitive advantage, driving long-term loyalty and retention. Equally important, Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) scores impact a hospital's reimbursement and bottom line.

### Researching a solution.

In a recently completed study, Brigham and Women's Hospital in Boston partnered with a consortium of companies to test the impact of a new product on the patient experience in the ED: digital whiteboards. Brigham and Women's, ranked as one of the top hospitals in the U.S., is at the forefront of using emerging technology to improve patient care. Their Digital Innovation Hub (the iHub) fosters a culture of collaboration between innovators and clinicians to support better outcomes and improve patient satisfaction.



The digital whiteboard was tested in patient rooms within Brigham and Women's Emergency Department (ED).

## Bringing the whiteboard into the digital era.

The digital whiteboard used for this study was a joint innovation with hardware manufactured by Avalue, software interface developed by patient engagement partner eVideon, and a 42-inch E Ink® digital paper screen. Recognized by many people as the screen in their Kindle eReader, digital paper provides the crisp and easy-to-read look of printed paper with the advantages of a connected and flexible medium.

eVideon's digital whiteboard software can be fully integrated with hospital electronic medical records (EMR) databases and programmed to update automatically when new information becomes available. This important feature ensures greater accuracy, reduces the likelihood of misinformation that can lead to errors, and makes it possible for nursing staff to focus on patients versus updating dry erase whiteboards by hand—a time-consuming task when time is in short supply.

A survey of frontline healthcare workers during the COVID pandemic showed they are feeling stretched too thin, with 93 percent of respondents reporting stress and 76 percent experiencing exhaustion and burnout.<sup>6</sup> As a result, many nurses are simply quitting. When the cost of filling temporary vacancies and hiring and training new staff is taken into account, replacing a registered nurse can range from roughly \$22,000 to more than \$64,000.<sup>7</sup> In this environment, digital solutions that help streamline nursing workflows may help improve employee retention and keep costs under control.

The screenshot displays a digital whiteboard interface for a patient named Katherine. At the top, it says "Good Morning Katherine" and provides her location (Emergency Department Room 032C), primary contact (John, Husband), and preferred language (English). The Brigham and Women's Hospital (BWH) logo and name are in the top right, along with the date and time (June 29, 2020 | 12:30 AM) and location (Boston). The interface is divided into several sections: "CARE TEAM" with photos and names of Dr. Johnston (Physician), Mary (Nurse), and Dr. Smith (Resident); "PATIENT ORDERS" showing "Labs Pending Time" (June 29, 4:00 PM) and "Imaging Status" (a progress bar from Ordered to Resulted); "Specialist Consults" (Ordered Service); "SAFETY" with a low fall risk icon and a low COVID-19 risk icon; and a "NO FOOD OR DRINK" sign. A "STATUS" section indicates "You are being admitted to Bed assigned, ICU". On the right, there is a weather widget for Boston (86° and rising, Clear, Wind: 7 mph (SE)) and a promotional banner for the "Mass General Brigham Patient Gateway" with a QR code and a "Scan Me" button. A photo credit to eVideon is at the bottom left.

Good Morning **Katherine**

Emergency Department Room 032C  
Primary Contact: John (Husband), (123) 456-7890  
Preferred Language - English

**BWH** BRIGHAM AND WOMEN'S HOSPITAL

June 29, 2020 | 12:30 AM  
Boston

**CARE TEAM**

**Dr. Johnston**  
Physician

**Mary**  
Nurse

**Dr. Smith**  
Resident

**PATIENT ORDERS**

**Labs Pending Time**  
June 29, 4:00 PM

**Imaging Status**

Ordered In Review Resulted

**Specialist Consults**  
Ordered  
Service

**SAFETY**

**LOW**

**COVID RISK LOW**

**NPO NO FOOD OR DRINK**

**STATUS**

You are being admitted to  
Bed assigned, ICU

**Setup your Mass General Brigham Patient Gateway now!**

**Scan Me**

Photo courtesy of eVideon.

eVideon's digital whiteboard interface provides personalized, real-time information to keep patients, families, and clinicians informed.

eVideon's whiteboard software is highly customizable to display personal information in the moment that's valuable to both patients and clinicians. This includes the name of the patient, the names of the care team, the patient's preferred language, the status of lab orders and test results, the local weather report, and vital patient safety information such as COVID status and fall risk level. The whiteboard software can also be customized to facilitate deeper engagement with the organization. In this particular study, the software displayed QR codes that gave patients and their families the ability to easily access the hospital's patient engagement portal. The software can change the language displayed on the whiteboard at any time with the push of a button.

***“Part of the anxiety in the ED is just not knowing what’s going to happen, so being able to access information is very powerful for patients.”***

— Peter Chai, MD, Assistant Professor of Emergency Medicine,  
Brigham and Women's Hospital.

### **The Brigham and Women's Study Goals and Methodology.**

Dr. Peter Chai led the study and was actively involved in the ED during the whiteboard analysis period from February to July, 2021. The primary goal of the cohort study was to understand the effect of digital whiteboard screens on patient satisfaction and comfort in a real-world emergency department environment. Fifty patients had a digital whiteboard in their room during their hospital stay, and fifty had no whiteboard (the 'control' group). The digital whiteboards were manually updated by a research team who scanned the EMR at designated times to select timely and relevant data to share. Patients were subsequently asked a series of questions to help assess whether or not digital whiteboards improved their experience.

The results were overwhelmingly positive. When given the opportunity to have a room with a digital whiteboard versus one without, 96 percent of study participants preferred having one. Other responses provided more insight tied to product features, including:

- 98 percent said they had no trouble resting with the digital whiteboard in their room.
- 92 percent said the digital whiteboard was not distracting.
- 70 percent said the digital whiteboard was either quite a bit or extremely helpful in helping them understand what was happening during their stay.
- Patients with the digital whiteboard were more likely to feel they were informed about delays in their care, and more knowledgeable about what to do in the immediate post-discharge setting.

“The Brigham's research findings demonstrate an overwhelming preference for digital whiteboards,” says Jason Friedman, VP of Sales for eVideon. “By delivering meaningful information in real-time to patients, families, and clinicians, hospitals can establish their Emergency Department as a preferred destination, setting them apart from the competition.”

## Digging deeper. What's behind the positive results?

To fully understand why a digital whiteboard made with E Ink improves patient satisfaction, it helps to understand what actually makes patients satisfied in the first place. U.S. News and World Report listened to a wide range of patients to generate their Patient Wish List,<sup>8</sup> with the most common patient needs expressed in plain language. Three of the top ten patient wishes are especially pertinent – and the first two are closely related:

1. Let me sleep.
2. Turn off the TV, radio, computer screen, etc. at night in my room so there's not a glare or noise that can disturb my sleep.

The reason why 98 percent of the Brigham and Women's study participants had no trouble resting with the digital whiteboard in their room is because E Ink screens do not emit light. This is in sharp contrast to traditional TV screens that are typically made with bright LCD light that glares in hospital rooms and disrupts sleep patterns.

Being able to sleep is not only the number one thing patients want to do while in the hospital. It's also essential for health and healing. Poor sleep has been tied to depression, high blood pressure, and increased risk of illness and infection.<sup>9</sup>

The Patient Wish List also included “keep my whiteboard up to date” and “make sure I understand my plan of care.” With updates to the digital whiteboard with data that already existed in the EMR—including next steps for the plan of care—it's easy to see why the Brigham and Women's study participants found the virtual whiteboard so valuable.

## Helping hospitals go green.

With the digital whiteboard now tested and proven in a real-world ED environment, hospital leadership teams will likely be weighing which digital whiteboard options to choose from. After all, the same information displayed on the digital whiteboards used in the Brigham and Women's study can be displayed on traditional (and initially lower cost) TV screens. And TV screens, unlike E Ink screens, are optimized for viewing video.

A survey of healthcare CEOs showed that cost control was their top concern.<sup>10</sup> Some CEOs will no doubt take the short-term view and choose to pay less per display. However, when the total long-term cost of ownership is taken into account, the E Ink displays offer an advantage due to their ultra-low power consumption and resulting energy savings over time. E Ink screens require far less power to operate than TV screens, which can add up to hefty energy savings when multiple units are deployed across a hospital system.

The secret to the energy savings lies in E Ink's unique digital paper technology. Digital paper is made with particles within microcapsules or microcups that are coated onto a thin film layer that act as a form of ink, but instead of ink being pressed permanently upon paper, the ink particles are automatically recycled to form new letters and images when the display image is updated. Zero power is required to display a static image indefinitely.

This means time-starved nurses don't have to run around the hospital turning off power hungry TVs every night (the ones that glare and disrupt sleep). In fact, E Ink's digital whiteboards can be left on twenty-four hours a day, seven days a week.

Low power consumption matters not simply for cost savings. A study by Johnson & Johnson<sup>11</sup> found that the healthcare sector is embracing a sustainability mindset. "Green" in purchasing decisions for healthcare products was rated by 54 percent of respondents as extremely important, and 40 percent as somewhat important. Energy efficiency ranked among the top-rated green product attributes, at 87 percent.

### **The present and future of smart hospital signage.**

Companies on the leading edge of patient engagement technology see every screen installed across every hospital, ranging from in-room televisions, tablets and mobile devices, to digital signs in waiting rooms and hallways, as an opportunity to strengthen the relationship with a patient and their family. As hospitals seek to attract, retain, and foster loyalty, they must invest in technology that will provide more personal interactions for patients and families throughout their stay and beyond the four walls of the hospital.

Using technology available today through eVideon and Avalue, hospitals can drive more value from their existing IT investments. eVideon's open APIs integrate with systems such as the EMR, Real-Time Location Services (RTLS), and other technologies. When a caregiver wearing a Wi-Fi connected ID badge enters a patient's room, an RTLS-integrated digital whiteboard can be programmed to sense their presence and automatically update to display with their name, role and photo: "This is Nurse Betty Smith." Families can see a record of exactly who has been in their loved one's room, what care was provided, and when.

Harnessing existing data and making it accessible to patients can save lives and increase revenues. For example, a hospital can mine its data to see which patients should consider tests based on their age and health history. Then a message can pop up on the digital whiteboard that says, "Jane, our records show you're due for a colonoscopy. Here's where to schedule yours."

And the engagement doesn't end with the hospital stay. The customizable features of the digital whiteboard software can act like an extension of the hospital marketing department. In the case of this study, patients and families were able to scan the QR code on the digital whiteboard to enter the hospital's patient portal and sign up to receive ongoing home-based care instructions.

In the future, digital whiteboard interfaces paired with low power E Ink screens will enable hospitals to discover more ways to convey vital information in the moment to patients and their families. The range and variety of signage will proliferate as surfaces of all kinds become smart, able to display exactly what people need to know, when they need it most. Hospital EDs will always be hectic places. But the balm of knowledge will provide comfort that's just as valuable as any medicine.



## About the Author

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Ted Page is a Co-Founder and Principal of Captains of Industry. Page has created content and marketing for a wide range of global companies including Apple, Microsoft and Starbucks.

## About the Sponsor

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E Ink is the originator, pioneer and commercial leader in digital paper technology. The company delivers its advanced display products to the world's most influential brands and manufacturers, enabling them to install extremely durable, low-power displays in previously impossible or unimaginable applications and environments.

E Ink encompasses the combined E Ink Corporation, which was spun out of the MIT Media Lab in 1997 to commercialize electronic ink and EPD technology, and Prime View International, which was established in 1992 as the first TFT LCD company in Taiwan, focusing on high-quality small-to-medium-sized TFT LCDs. In 2009, Prime View acquired E Ink Corporation to further integrate and expand the EPD supply chain and the new combined companies were branded as E Ink.

E Ink's corporate philosophy centers around delivering revolutionary products, excellent user experiences, and environmental benefits through advanced technology development.

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