

## The High-Tech Patient Room of the Future

Imagine a hospital room where patients are watching television on a screen on the wall and ordering hospital food on an electronic tablet, while nurses push buttons on the wall to check a patient's vital signs, which are illuminated above the hospital bed. This is not an episode of *"The Jetsons,"* but rather, the patient room of the future.

NXT Health, a nonprofit organization focused on leading research efforts to impact the future of healthcare, has developed a high-tech hospital patient room - termed the *"Patient Room 2020 Concept"* - to coordinate patient care through technology and design. This futuristic room, developed through a partnership with Clemson University's Healthcare + Architecture Graduate Program under a contract with the U.S. Department of Defense, serves as an answer to the question: *"What would a patient room look like if the architecture, products, technology, and medical processes were all designed in unison?"*<sup>1</sup>

Some of the aspects of this futuristic room are relatively simple, such as rubber floors and Corian surfaces, designed to reduce the spread of bacteria and the risk of *hospital acquired infections (HAI)* as well as cushion patient falls.<sup>2</sup> Other innovations are much more *"high-tech."* One of the more notable features in the room prototype is the *"patient ribbon,"* which looks similar to a canopy above the patient bed, and extends from the wall where the headboard is located to the opposite wall. This ribbon includes many of the necessary wires and pipes needed in a patient room, but also contains a sound system which can block out outside noise; a light box which can be used for light or mood therapy; and, a screen for teleconferencing with providers, watching television or movies, and accessing hospital information and the Internet.<sup>3</sup> In addition to innovations to improve a patient's hospital experience, the room includes tools for providers as well. An entry workstation, located by the doorway to the patient room, contains different colored lights to indicate when hands should be washed, and when they are sufficiently clean.<sup>4</sup> The workstation, as well as the *"bedside caregiver hub,"* features embedded computers for providers to quickly access and enter patient information in real-time.<sup>5</sup>

The issues NXT's futuristic hospital room seeks to address include:

- (1) Older facilities whose construction projects had been stalled due to the *Great Recession*;<sup>6</sup>

- (2) The HITECH Act's requirement that healthcare facilities adopt electronic medical record technology by 2015;<sup>7</sup>
- (3) Growing demand for healthcare services as a result of the aging *Baby Boomer* population;<sup>8</sup>
- (4) An overabundance of preventable medical errors, which result in over 200,000 patient deaths annually;<sup>9</sup> and,
- (5) Reducing the over \$2 billion in annual wasteful spending due to inefficiencies.<sup>10</sup>

The goals of the *"Patient Room 2020 Concept"* project were to:

- (1) *"Humanize the healthcare experience by promoting personal customization, control, and comfort for patients, family, and staff";*<sup>11</sup>
- (2) *"Restore health by promoting therapeutic outcomes through the prevention of adverse events (such as patient falls), hospital acquired infections, and medication errors; as well as the creation of a safe and healthy work environment for staff";*<sup>12</sup>
- (3) *"Streamline operational processes and work patterns in order to improve efficiency, limit the ability for mistakes to occur, and increase staff time for direct patient care";*<sup>13</sup>
- (4) *"Empower individuals through improvements in collaboration between staff, patients and families by providing on-demand access to information and resources, which can increase patient advocacy and participation in the care delivery process";*<sup>14</sup> and,
- (5) *"Adapt the physical environment to compliment varied user preferences, as well as streamline the design and construction phase of a hospital project for healthcare systems through the utilization of customizable and environmentally sustainable pre-fabrication technologies."*<sup>15</sup>

After six years of research, design, and assistance from over thirty industry partners, NXT built a full-scale patient room sample at the DuPont Corian Design Studio in New York City in July 2013.<sup>16</sup> While this high-tech room may seem like a large leap from the hospital designs of today, such innovations will likely be implemented in the next several years, and

communities are already discussing the prospect of implementing this prototype in future hospital rooms.<sup>17</sup>

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<sup>1</sup> "Patient Room 2020 Concept," NXT Health, <http://nxthealth.org/portfolio/patient-room-2020/> (Accessed 2/11/14).

<sup>2</sup> "Could hospital 'room of the future' be part of new med school?" By Chad Swiatecki, Austin Business Journal, Dec. 27, 2013, <http://www.bizjournals.com/austin/blog/at-the-watercooler/2013/12/wsj-takes-a-look-at-high-tech.html> (Accessed 2/11/14).

<sup>3</sup> "The Hospital Room of the Future," The Wall Street Journal, <http://online.wsj.com/news/interactive/PATIENTPRNTCHRT?ref=SB10001424052702303442004579119922380316310> (Accessed 2/11/14).

<sup>4</sup> *Ibid.*

<sup>5</sup> *Ibid.*

<sup>6</sup> *Ibid.*, NXT Health (Accessed 2/11/14).

<sup>7</sup> *Ibid.*

<sup>8</sup> *Ibid.*

<sup>9</sup> "A New, Evidence-based Estimate of Patient Harms Associated with Hospital Care" By John T. James, *Journal of Patient Safety*, Vol. 9, No. 3, (September 2013), p. 128.

<sup>10</sup> *Ibid.*, NXT Health (Accessed 2/11/14).

<sup>11</sup> *Ibid.*, NXT Health (Accessed 2/11/14).

<sup>12</sup> *Ibid.*, NXT Health (Accessed 2/11/14).

<sup>13</sup> *Ibid.*, NXT Health (Accessed 2/11/14).

<sup>14</sup> *Ibid.*, NXT Health (Accessed 2/11/14).

<sup>15</sup> *Ibid.*, NXT Health (Accessed 2/11/14).

<sup>16</sup> *Ibid.*, NXT Health (Accessed 2/11/14).

<sup>17</sup> *Ibid.*, By Chad Swiatecki, Dec. 27, 2013 (Accessed 2/11/14).



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