THE SMART(er) PATIENT ROOM OF THE FUTURE

The Smart Room of the Future has been talked about for more than a decade now, but we’ve really not made all that much progress as an industry in moving toward this vision.

The reality is that advancements toward a patient Smart Room of the future have to be accomplished very economically. You would be hard pressed to find many hospitals throwing a million dollars a bed into Smart Room initiatives. In fact, some hospitals aren’t even equipped with the most basic of communication systems, let alone the backbone needed for the visionary Smart Room. Technology is great, but its one thing to talk about this in a laboratory setting. How do you implement in the real world? That is the critical question.

In this eBook, we’ll be looking at existing or near-term technologies and other attainable innovations in interoperability, big data, patient engagement and clinical workflow that will help us get smarter as we journey toward the technological utopia being painted by many futurists and thought leaders today. The Smart Room may still be out of reach for the majority of providers, but a smarter room is a great place to start the journey.
IBM and UPMC (University of Pittsburgh Medical Center) were among the pioneers pushing for the development of patient “Smart Rooms”. The two organizations teamed up way back in 2005, after announcing a $402 million agreement to drive health care transformation. As part of that agreement, a $50 million co-development fund was established and used to further advance the UPMC SmartRoom project, which promised to revolutionize inpatient care.

The two organizations planned to jointly sell and promote the SmartRoom technology and roll out the solution nationwide, but instead they eventually sold the technology to a third-party vendor.

Then in 2013, NXT Health, a program of the Department of Defense, created a concept patient room that was dubbed “Patient Room 2020.” The conceptual proposal demonstrated the impact of designing architecture, products, technology, and medical processes all in unison.

The project won a national design award from the Center for Health Design “affirming that experts recognized the potential of such a design to create a new medical experience.” But in a video feature with TIME Magazine, one of the project’s founding sponsors concluded a virtual tour by saying,

“Even if we have one element here that is incorporated into a hospital, that’s a success.”

That quote is very telling. While Patient Room 2020 is an impressive demonstration of creativity, innovation and vision, its design (or even a fraction of what’s showcased) lies well beyond the realm of possibility for almost all hospitals. And while this type of big picture, system level thinking is a valuable and integral part of advancing healthcare into the future, we’ve been missing the other half of the equation. How do we get there from here?

At least the road ahead will move more quickly, according to Matthew Holt, Co-Chairman at Health 2.0 and Founder/Author, The Health Care Blog. Holt points toward the Electronic Medical Record (EMR) as a major culprit for stalling other technological advancements and innovations. He expects the path to be much clearer now that EMRs
have proliferated the industry.

“EMR implementation has really sucked a lot of the oxygen out of the room,” Holt said.

“There’s been so much of a focus on installation, management and training that it has stopped advances elsewhere within hospitals. Now that most providers are beyond that, we should see them acting quickly to speed up other technology initiatives.”

THE IMPORTANCE OF INTEROPERABILITY

First up on our list of near term priorities for the Smart Room is interoperability. One of the biggest fallacies surrounding the Smart Room is that someone must, or can, own all of it. In a green field, where you are building from the ground up, it’s plausible that one organization could outfit a hospital with a single-source Smart Room. But again, that’s not the reality for the majority of providers. Somehow, someway we need to arrive at a set of interoperability standards that are defined and acknowledged. The vast majority of hospitals are already here. New technologies that aim to advance providers toward smarter patient care must accommodate existing legacy technologies. They must be flexible. They must be interoperable.

Of course, a large body of work with interoperability is to ensure that new systems can effectively connect to a patient’s EMR. But that’s only part of the challenge, and the opportunity. Interoperability has to include the ability for all devices to talk to all systems. It is devices that collect patient data. As it is collected, data needs to be sent to the systems or people who need it, in real time. Those devices have to talk to the data in the system and the system has to talk back.

Historically, Nurse Call, one of the mainstays of patient care, has been a limiting factor when evaluating options to obtain data from the patient room. Nurse Call is a regulatory requirement for hospitals with its functionality controlled by the UL1069 standard and the interop-
erability limited by the standard and the willingness of Nurse Call vendors to open access to their systems. Given that Nurse Call is the patient’s lifeline to the nursing team, smart rooms must be equipped with smart Nurse Call systems, which enable more open interoperability with external systems.

One likely answer for tech-powered Smart Rooms of the future is an intelligent hub in each room that is single wire connected. Such a hub can act as a Smart Room controller. With open standard design, this hub would allow for devices to “plug in” both from a functionality perspective as well as a power source. In essence, this intelligent hub would act as a UL, approved, room server, enabling every room device, from alarm management technologies to nurse call to a web cam (video sitter) to get power and have a data connection.

This plug and play approach to technology isn’t just valuable for its flexibility. It also creates competition among multiple vendors for individual solutions that ultimately will drive quality up and cost down for hospitals.

In the past, technology in hospitals was largely dominated by a small handful of vendors. Time and again, this has led to disconnects between new technologies. Providers have consistently been frustrated because specific technology solutions couldn’t talk to each other. There has always been this challenge of control.

If a few organizations are in control, what is the motivation for change? You see it now with EMR vendors. It’s the same old story. Moving forward, this story has to change.

Part of that change will come from the newly established Center for Medical Interoperability (C4MI). Modeled after CableLabs, a non-profit research and development consortium that drove interoperability standards throughout the cable industry over the last 30 years, C4MI strives to create the same unity in healthcare.

“C4MI is committed to solving the shared technical challenges all healthcare providers face in integrating medical devices, EHRs and
IT systems in a plug-and-play way”, said Tony Heard, partner at InfoWorks, a business and technology consultancy. Heard, who has been actively supporting the Center’s early development, says the organization’s membership already includes the largest systems in the healthcare industry with non-profit, investor owned, and government hospitals from across America.

“Leading hospital systems realize that it is important to jointly support initiatives that will create ubiquitous access to data,” Heard said.

“So, just like the cable industry, C4MI is bringing procurement power together to dictate the adoption of interoperability frameworks and drive participation from manufacturers industry-wide. The ultimate objective is to capture data from medical devices throughout the continuum of care, synch that data with EMR’s, and make it available immediately to clinicians to inform real-time care decisions.”

This journey toward interoperability will not be completed overnight, Heard concedes. In the meantime, hospitals should be laying the groundwork, thinking ahead and establishing foundational infrastructure to take full advantage, because eventually, interoperability will happen.

As C4MI’s Board Chair, Dr. Michael Johns said recently in Becker’s Hospital Review,

“As healthcare professionals, and as an industry, we can no longer accept the status quo.”

**TURNING DATA INTO BIG DATA**

“Big data software applications represent the single most effective solution to addressing the myriad of cost pressures facing hospitals.”

As part of a feature on how hospitals can make big data pay big, Donna S. Charles told Healthcare IT News that “with each passing year,
these technology investment decisions will become increasingly pivotal."

Charles is a principal consultant with Oron Healthcare Group. She is not alone in her assessment. A recent PwC study found that 95 percent of healthcare CEOs are exploring better ways to harness and manage big data. Meanwhile, a McKinsey and Co. report estimated that big data could help reduce U.S. healthcare expenses by as much as $450 billion.

So everyone is big on big data, and obviously the ability to capture, share and leverage data should be a key consideration for the patient Smart Room of the future. But again, the problem is we don’t have a clear path to making big data an everyday reality.

Back in 2013, Joel Dudley, director of biomedical informatics for the Mount Sinai medical school, shared a vision for big data and its potential to dramatically impact the healthcare system.

“I think what we’re hoping for is that we’re going to build a health care system where complex models are firing on an almost day-to-day basis,” Dudley said during a Fast Co. Exist interview. “As patients are getting information about them put in the electronic medical record system there will be this engine in the background.”

Dudley was quick to acknowledge that the industry needed to walk before it could run. As he compared Facebook’s capabilities in harnessing analytics and insights within the “social network” to what was happening within the “clinical network” he was obviously frustrated by the industry’s progress.

“There’s nothing like that right now—where we have a sort of predictive modeling engine that’s built into a health care system,” he said.

“Those methods exist. The technology exists, and why we’re not using that for health care right now is kind of crazy.”
Several years later, not much has changed. Big data remains a buzzword for most hospitals, a pipe dream that is far beyond their reach. Despite the fact that we are leaving very rich digital data footprints in healthcare, we have not consistently leveraged it for key patient insights and real-time workflows. We are largely failing to make data work for us like other industries, namely retail.

“I think hospitals are starting to realize that they are basically an information system with beds and that they need to start acting like it,” Holt said. This realization must be followed by more action. The possibilities of big data are truly compelling.

A research study published in Health Affairs highlights some of the clearest opportunities to reduce costs through the use of big data are: high-cost patients, readmissions, triage, decompensation (when a patient’s condition worsens), adverse events, and treatment optimization for diseases affecting multiple organ systems.

The SmartRoom needs to provide proactive, and eventually, predictive care.

To accomplish this, we must get better at combining streams of data to fuel reminders and make recommendations on how to preemptively serve up just what patients need. But how do hospitals advance their ability to harness the power of data to drive better decisions and deliver proactive, predictive care?

Before you do anything else, set your strategy. The first priority for your organization is to develop a strategic plan for how data will be used to drive action. With a holistic strategy for how data will be leveraged, you can’t possibly be effective.

With your strategic plan in hand, it’s important to focus on data that can be captured, measured and utilized. Some hospitals are already deploying technology today that can provide a much clearer picture of what’s occurring in individual patient rooms, as well as overall unit performance against established goals and protocols like phone com-
pliance and rounding reminders.

We have to find better ways to combine disparate information sources. Over the years, “smart” medical devices have added to an ocean of data that surges through hospitals. Integration is key for hospitals to avoid being overwhelmed by waves of data and instead leverage it for insight and action.

Lastly, you need the proper software tools to use data effectively. Without software, you can’t truly understand where all the pieces are and how to make things more efficient. What are nurses spending time on? Could specific tasks be better tackled by someone else? Could you improve the way your support nurses to get it done better/more quickly?

1. Benefits of applying a big data approach to in-room patient care:
   
2. Address service recovery to improve patient satisfaction
   
3. Improve staff satisfaction by balancing workflow and promoting positive care trends
   
4. Focus on performance issues as they occur
   
5. Identify trends and make evidence-based decisions to drive true accountability
   
6. Maximize coaching opportunities by targeting areas for improvement
   
7. Explore issues and discover root causes to improve patient safety and care delivery
   
8. Measure and manage alarm activity by floor, by device and by room to prevent alarm fatigue
ENGAGEMENT + EXPERIENCE = PATIENT PRIORITIES

With interoperable technology and more effective data practices on the “to do” list, hospitals also must track more closely with patients, to improve their experience and their engagement.

Patient interactivity is a big part of tomorrow’s Smart Room. Historically, the only interaction available to patients was pushing a button or talking over an intercom. Lots of companies have developed interactive devices for patients but sales have been hard to come by because of the related expense. They have yet to effectively demonstrate an ROI.

It seems obvious that a true Smart Room enhances the ability of patients to be actively involved. It is very frustrating for patients and their families to be in the dark about their care. So, even simple things like knowing when the doctor will be visiting the room again would be a big win. If patients had the ability to look at their own records, follow along with their care plan, see what is coming next, it’s easy to imagine how much more engaged they would be.

This is truly powerful, because if the patient better understands the plan and what you’re trying to accomplish with them, they will be more cooperative and better work with the clinical team to achieve desired results faster. Additionally, you would see patient satisfaction climb dramatically.

The Smart Room of the future will pull the curtain back and allow the patient and their family to see what’s going on with their care. This means much more transparency and access, and inclusion. Just knowing what is happening will increase engagement. Wouldn’t it be great for patients to know that specific requests they made are actively being addressed. Or for patients to completely understand their care plan because they were provided educational resources, such as quick videos or other interactive tools, to help them?
To accomplish more patient interactivity and engagement, hospitals should consider leveraging a piece of equipment that more than 90 percent of patients and family members bring with them to the hospital: their smartphone.

Powering patient engagement through a smartphone app is a low-cost, high impact way to create a new dynamic in patient communication and education. Despite an explosion of health apps and mobile products in recent years, many patients and caregivers are handed written materials or directed to a special channel on their TV during their hospital stays. But through a fairly simple, user-friendly mobile app, the hospital could serve up critical information, helpful tips, educational content and more. For patients/family that don’t have a smartphone, the hospital could make devices available for rent from the gift shop. Apps could also be accessed through tablets for those that prefer, or require, such a device for mobile engagement (i.e. elderly, young, physically impaired).

We already see mobile software that helps patients, physicians and other health professionals engage jointly in the recovery plan and stay well between encounters. Now we’re seeing traction for in-room mobile experiences. Most hospitals are at least dipping their toes in the mobile waters.

Holt points to good momentum in combining entertainment and information to enhance the patient experience. Mobile devices that allow patients to interface with their health records, watch movies, chat, play video games and engage with members of the staff are available in the market and expected to be on the rise.

We just need to march faster toward ubiquitous application of mobile technology when it comes to patient engagement and education.

More broadly though, we face an underlying challenge to patient experience. Our entire system is designed around clinicians, not patients.
Moving forward, the voice of the patient is going to be critical. What do patients want for their own care?

What is important for them to heal? What do they need, not just clinically but experientially, to get better?

Tracie Clang, a Performance Improvement Coach with TruthPoint and a 30-year healthcare industry veteran, suggests that hospitals should strive to take a lesson from the hotel industry for exceptional customer service, using the integration of technology to create personalized, preference driven experiences for its patrons.

“When you walk into some hotel chains, they welcome you by name when you enter the building,” Clang said.

“They have the TV in your room tilted to your liking. They’ve arranged the workout facility to be opened early because they know you like to workout earlier in the morning. Every detail of your stay is responsive to your unique needs and customized preferences. Think about the power of that in a hospital room, where patients most often feel out of control, uncomfortable and unheard.”

In order to accomplish this, hospitals must advance beyond their reliance on traditional paper based customer satisfaction surveys where feedback is limited and is relayed to the facility up to 12 weeks after it has been collected. Instead, providers need access to real-time, point-of-care feedback on a continuous basis so that at any given point, clinicians can see what’s going on with their patients and what’s important to them from an experience standpoint.

But the real key to patient engagement and experience is not to develop tunnel vision on new technologies.

“We are rapidly losing focus on the whole patient. With technology, you are not present to the patient; you are present to the technology. That is the risk.”

“So, in the face of rising technology, you have to maintain a view of the
whole patient. The danger is that we are breaking patients down into bits of information, measurable metrics and lines of code, and quickly losing sight of the person behind all that data.”

Another concern for Clang is the fact that we’re also losing the human touch in healthcare.

“We spend a lot of time talking about curing, but not enough time talking about healing,” she said. Patients need human touch. They need empathy and support. But we’re headed the opposite direction in healthcare.”

As an example, Clang points to lobby kiosks that are being installed at systems across the country. For the most part, TruthPoint feedback has revealed that patients have not responded positively to these kiosks, despite the fact that they simplify and streamline the intake process and in the end save time for both patient and staff.

“When there’s a kiosk, the patients are often reporting to us that the front desk staff do not even look up and acknowledge the patient’s presence when they enter the clinic. They just point to the kiosk. So, the patient’s first interaction and experience is an automated one with no human connection. That isn’t adding positively to the patient experience.”

Instead, hospitals should be considering how to ensure that patients fully understand and appreciate advancements in the Smart Room arena, including possibly using a concierge to introduce key technologies to each patient and explain the best ways for the patient to interact with assigned clinicians and care plans.

**MAKING WORK FLOW MORE EFFICIENTLY**

“Don’t give us another button to push, unless that button does half a dozen things all at once.”
That’s a common refrain we hear from nurses. In other words, if you are implementing technology to improve workflow, it can’t increase workloads. So, as we embrace technology, make strides towards integration, leveraging big data, connecting with patients more deeply, we can’t forget the clinical team responsible for delivering care. How do we create a more efficient and effective workflow for clinical staff that fosters support, accountability and improved satisfaction, both for caregivers and their patients?

Nurses are worked to the bone. Stretched thin. Challenged to do more than is humanly possible in one shift. But what’s worse is they are subjected to countless technology “enhancements” and new devices, most of which are not integrated. The only thing harder for nurses to manage than their patient workloads is the juggling that comes with competing technologies. Too often, technology that is designed to make life easier for clinical staff instead creates more complexity and stress. This is a main reason why so much technology goes unused or misused, and why hospital leaders are skeptical about layering on additional technological innovations moving forward.

In the absence of useful technology, nurses are very creative. Whether it’s using cassette recorders to capture instructions for transitioning of patients between shifts, or counting ceiling tiles to measure how far a patient walks during rehab, nurses have a long history of being very resourceful in the absence of needed tools. The problem is that being resourceful isn’t necessarily efficient.

To move toward Smart Room concepts for clinical workflow, hospitals must focus on assisting nurses with initiating, updating, following and meeting goals for patient care plans by leveraging existing (and cost effective) technologies. Here are a few things that could be accomplished with effective technology that is on the market today to help take the guesswork out of delivering care and dramatically improve workflow for clinicians.

Use a Fitbit or other wearable device for tracking physical activity and reporting progress.
Empower nurses with smartphones connected to all information and messaging related to patient care.

Deploy talk to text technology to make transition notes more efficient and accurate.

Instead of playing “find the beeping alarm”, a nurse could be notified on his or her phone that a specific patient needed assistance.

Replace the dome light outside patient rooms with a smartlight that gives clear indications of need level, in conjunction with large hall display screens showing real-time, open care task response.

Build in checks and balances with care assurance technology (including Real Time Location Services) to verify and record delivery of care at the patient’s bedside.

Enable reminder messages to the clinical team to improve patient satisfaction and safety by enhancing the quality and consistency of call response, rounding, turns, pain and vitals.

Create messaging protocols and escalations based on the urgency or type of request.

Despite the available options, Holt still sees far too many basic, outdated systems in play when it comes to nurse communications.

“It just hasn’t come along as far or as fast as it should have,” he said.

“There are tools that improve the management of workflow, the tracking of activity. They can improve nurse productivity and health outcomes. Some of these tools have been around for a while, but we’ve had some false starts with adoption and implementation.”
SMART ROOM OBSTACLES

What’s really holding us back from smarter patient rooms?

Cost. The almighty dollar. Budget constraints handcuff and cripple most hospitals. Outside of academic institutions, we really haven’t seen much in the way of consistent innovation, and that’s largely because of shortages in cash flow for placing bets on exciting new ways to deliver care. Instead, most facilities are forced to play defense and plug holes in their approaches to patient care.

Short term focus instead of investing in long-term. Most trying to get to next quarter, or next year. And not involving the people with the most influence on care – the nurses. Instead financial decisions.

There’s not an easy path for organizations, no model, no obvious way. It’s still very early. As a result, hospitals have to think about the Smart Room of the future as a step-by-step process. One brick at a time. It’s a journey, a destination, not a snap decision. Again, this is why interoperability is so critical. You have to build toward the Smart Room, so you have to be able to add on and expand over time without having to recreate the wheel.

A lack of education. Many new technology investments are being made without adequate training of, and context setting for, clinical teams. Without a full understanding of how new technologies work, and their role in the larger quest to deliver smarter care, many useful technologies that would advance a hospital closer to Smart Room status go untapped or underutilized.

A common set of myths about the patient Smart Room have been perpetuated our inability to move the industry forward in a more rapid fashion.
THE FIVE BIGGEST MYTHS SURROUNDING THE SMART ROOM

It’s an all or nothing proposition. The Smart Room is a journey, not a destination. But in so many conversations, the vision is painted in a way that makes hospitals feel like they either have to change everything all at once, or be stuck with the status quo. As mentioned before, most hospitals are not equipped from a budget and staff standpoint to pull off a full implementation of a true Smart Room. But many could be ready to take the first steps and bridge from the past to the future.

There can be only one. This is not a technology arms race. The Smart Room is not something that one organization should, or even could, own. Instead, it’s a collection of technologies, solutions and companies that all can collaborate and integrate for the greater good of patient care. Just like the app store that fuels your smart phone, plug and play, interoperable devices and solutions are the only way to push the entire healthcare industry ahead.

It’s all about the technology. Yes, technological innovations are a core driver of the patient Smart Room. We also need to stay focused on careful redesigns of nurse workflow, nurse staffing plans, on better leveraging data, and on optimizing patient experience and engagement. Technology runs through all this, but the discussions and decisions required go far beyond tech considerations. And if technology is thrown at problems without a strategy, it will only add confusion and further challenges to quality patient care.

The future is out there, somewhere. The Smart Room is not nearly as “futuristic” as we make it out to be. Much of the advanced technologies required to power a “next generation” approach to in-room care already exist and are being successfully deployed in other industries. It’s not as much about waiting for technology as it finding ways to successfully introduce it into a hospital setting.

It’s for everyone. At this point in time, the truth is not all hospitals
are ready for a significant foray into Smart Room initiatives, even though the technology is attainable. We still need early adopters and innovators to forge ahead and soundly demonstrate the value of investing in Smart Room projects. The champions are required to usher in a new day in patient care that delivers on the promise of the picture that has been painted by visionaries and thought leaders.

**THE BIG DECISION**

At the end of the day, hospitals must decide whether they are leaders or followers. To advance Smart Room concepts and fuel application, not just innovation, in patient care, it is going to take a group of early adopters to clearly demonstrate the superior clinical and financial outcomes that are possible.

Holt sees more hospitals answering this bell.

“Some hospitals are getting religion when it comes to the importance of innovation. Historically, that’s not been the case,” he said.

“There hasn’t been as much experimentation or agile use of technology. Most of them are at stage one, but the forward thinkers are quickly working to figure it out.”

Even so, all hospitals must realize that without embracing change, they will find themselves in trouble. They must realize that the world around them is shifting dramatically, and the only way to survive is to care smarter. Most importantly, they must listen more closely to nurses and patients than ever before.

These changes are within reach, both financially and operationally. With a solid strategy in hand, a carefully planned roadmap and a culture that embraces change, hospitals can thrive. Those who refuse to help define the future of patient care will face a much different reality. Which side will your hospital take?
About Amplion

Amplion is building a better future for patient care. We combine capabilities in clinical workflow optimization, advanced patient communications technology, and in-depth analytics to help organizations make data-driven decisions and create accountability within clinical teams. We close care loops and dramatically improve clinical and financial performance as well as patient and clinician experience.

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