



White Paper:
Smarter Aging
Through Connected
Experiences

Introduction

Innovations in IP communications, telehealth, wearables, IoT and mobile health apps are leading to increased patient satisfaction due to a highly improved wireless-connected experience. Driving patient engagement by moving them from traditional methods of care delivery to digital health interventions can go a long way in helping seniors adopt smarter aging through their connected experiences—giving them the confidence to have a positive outlook towards their golden years.

This paper focuses on how integrating and applying three key enabling technologies—IP Communications, VoIP optimized Wi-Fi and IoT—is the way forward to achieve better patient engagement and greater business outcomes.



How is Technology Impacting the Senior Care Experience Today?

Seniors are becoming increasingly attuned to technology. According to Pew Research Center, 6 out of 10 seniors are now online daily.¹ They are corresponding over emails, interacting with family and friends through social media and video chat, getting their shopping done online, using mobile banking apps and generally adapting well to the new equations that technology has thrust upon them.



US\$ 47.4 billion

According to a study by Markets and Markets, the senior market in consumer healthcare will be worth US\$ 47.4 billion by 2020, expanding at an estimated compound annual growth rate of 5.6% between 2014 and 2020.

Increased technological awareness among seniors has pushed up their expectations from the healthcare sector as well. Seniors belong to a demographic that requires the maximum number of healthcare interventions, whether for chronic ailments, terminal illnesses, or simply for regular medical check-ups. As per the Medicare handbook, at least 70% of people over 65 years of age in the US will require some form of long-term care.² In an aging nation with a rising senior population estimated to touch 56 million by 2020, it is extremely crucial that the healthcare sector be equipped to respond and reciprocate to this segment digitally.³

personalized care to older adults, whether they live independently, in assisted care or in skilled nursing communities. Email communication, patient portals and mobile phones are enhancing the way care is delivered.

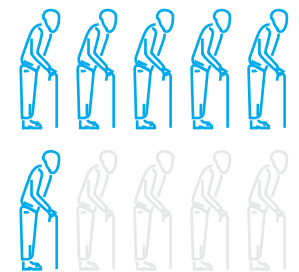
Innovations in IP communications, telehealth, wearables, IoT and mobile health apps are resulting in increased patient satisfaction due to a highly improved connected experience. According to a study by Markets and Markets, the senior market in consumer healthcare will be worth US\$ 47.4 billion by 2020, expanding at an estimated compound annual growth rate of 5.6% between 2014 and 2020.

Senior care providers are leveraging the power of technology to ensure better, faster, more



70%

of people over 65 years of age in the US will require some form of long-term care.²



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What Seniors Expect from Mobile Patient Portals



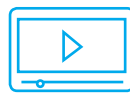
Scheduling Capabilities



Clear Test Results and Office Note Access



Messaging With Clinicians



Education Tools



Ability to Check Prescriptions and Refills

1. <http://www.pewinternet.org/2014/04/03/older-adults-and-technology-use/>

2. 2015 Medicare & You, National Medicare Handbook, Centers for Medicare & Medicaid Services, September 2014

3. U.S. Census Bureau, 2012 Population Estimates and 2012 National Projections

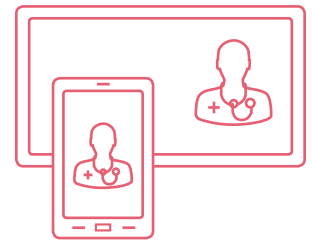
Moving from Patient Engagement to Patient Empowerment



Traditionally, digital health has been perceived as an additional benefit to the standard method of receiving health care services. But now is the time for incorporating a fundamentally new strategy, a paradigm shift. It is time to consider digital health as one of the primary methods of receiving medical aid. It is important for both providers and patients to realize that at its core, digital health maximizes value for patients by achieving the best outcomes at the lowest cost. Older adults, with their growing infirmities and

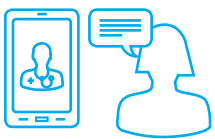
declining cognitive abilities, can especially derive immense benefits from adoption of technology driven healthcare.

However, a key factor to adoption remains the ease of using the technological interventions. Since the target profile would be individuals who are relatively new to technology and not abreast of the latest gadgets or tools, easy integration is a must-have to create a seamless experience and encourage connectedness amongst seniors.

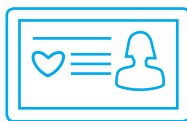


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Digital Healthcare Benefits for Seniors⁴



Streamlined Communication Between Patients and Staff



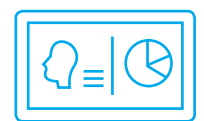
Automated and Personalized Patient Education



Distraction From Pain and Anxiety



Improved Control Due to Smart Room Functionality



Interactive Patient-Provider Experience

Digital Healthcare Benefits for Providers:

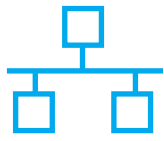
Analytics to make policy adjustments and create intervention programs for meaningful change

Smart building infrastructure management

Enabling Technologies for Enhanced Connected Care Experience

Senior care and skilled nursing communities are looking to adopt innovative care delivery models that are based on the premise that higher levels of patient engagement will provide better health outcomes. They aim for interactive patient care through state-of-the-art devices, such as smart televisions and digital signage, that blend

entertainment with information, education and intelligent routing of patient requests. However, to improve the care experience, assisted living and skilled nursing communities must integrate **three key enabling technologies** to achieve greater business outcomes.



1

IP-Based Communications



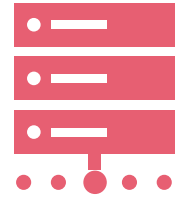
2

Wi-Fi



3

IoT



A high-performance Wireless LAN (WLAN) network is crucial for IP-based IoT-ready mobile health applications to be productive.



1 Meeting Telehealth Demand Using IP-Based Communication



Communication between care team members is extremely critical. However, the pace of a caregiver's daily routine is often frantic and the frequency of unplanned events is high. Given the numerous disruptions to planned workflows that a care provider experiences, communication channels like traditional phones and email become ineffective for highly mobile workforce. Also, in a community campus that may be spread over several buildings, it becomes difficult to locate specific personnel in a timely manner.

In such circumstances, Mobile Unified Communication (UC) tools and VoIP can play a vital role. With its use of Presence technology that indicates a user's availability and readiness to communicate from anywhere using Wi-Fi or cellular networks, UC offers real-time information on individual availability of doctors

and caregivers, and how best to reach a person — phone, instant messaging, video call or any other communication option. By integrating IP communications with patient records, the care staff can become more proactive, streamline communication between patient and staff, and create a more interactive and personalized patient-provider experience.

A key application of IP-based communications is telehealth, which is a fast-growing trend in healthcare. If we look at its possible outcomes, telemedicine can reduce emergency visits by senior residents by 28%, resulting in potential savings of more than US\$ 100 billion to the US healthcare system by 2020.⁵ According to the Centre for Connected Health Policy (CCHP), telehealth includes distinct domains, such as video-based consultations, remote patient monitoring and mobile health.⁶



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5. <http://www.healthitoutcomes.com/doc/mhealth-billion-savings-potential-0001>

6. <http://cchpca.org/what-is-telehealth>

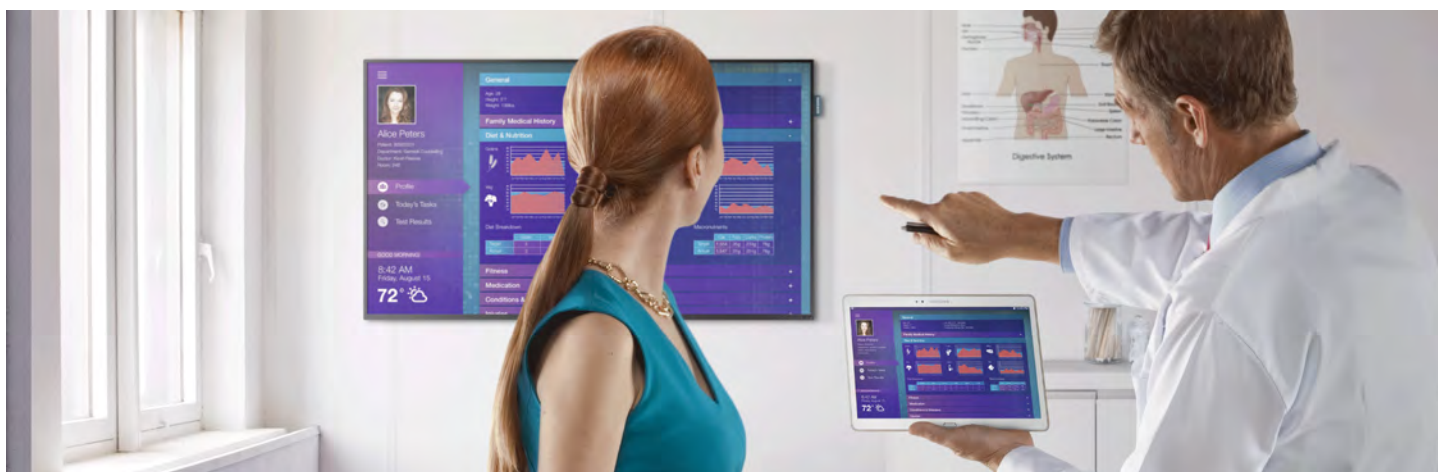
Video – An Indispensable Component of Telehealth

Videoconferencing is an indispensable component of telehealth. It can be used for both diagnostic and consultative purposes, and can be combined with other media, including the patient's electronic health records (EHRs) to expedite diagnosis and treatment. At 70% reported usage, two-way video or webcam communication is the most utilized telehealth solution.⁷

Conducting ad-hoc and scheduled virtual medical visits, performing complicated surgery while being guided from a specialist from across the globe, and providing medical management to a chronically ill patient in a remote location are all possibilities made real by the advancement in real-time IP-based voice and video collaboration technologies.



Remote Patient Monitoring – Revolutionizing Healthcare Delivery



Remote patient monitoring or RPM is another emerging model of care delivery via telehealth. It lets a patient use a mobile medical device to perform a routine test and send the test data to a healthcare professional in real-time. It shows promise in improving the quality and reducing the cost for managing many common chronic diseases.

As per CCHP, the concept of RPM “allows a provider to continue to track healthcare data

for a patient once released to home or a care community, reducing readmission rates.” This is in line with the Hospital Readmissions Reduction Program (HRRP) and is effective for discharges beginning on October 2012, which mandates reduced payments to hospitals with excess re-admissions, by way of penalizing them.⁸ The HRRP provides an incentive for hospitals to decrease re-admissions by coordinating transitions of care, and increasing the quality of care delivered to Medicare beneficiaries.



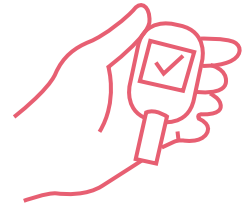
Timely medical intervention is the most effective solution for successful diabetes management.

7. <http://www.himssanalytics.org/research/essentials-brief-telemedicine-study>

8. <https://www.cms.gov/medicare/medicare-fee-for-service-payment/acuteinpatientpps/readmissions-reduction-program.html>

RPM also helps seniors stay healthy in the comfort of their home and community without having to make physical visits to their healthcare providers. A case in point is the treatment of a chronic condition like diabetes. Statistics from the American Diabetes Association reveal that of the 1.4 million Americans who are diagnosed with diabetes every year, the percentage of seniors (ages 65 and above) remains high at 25.9%.⁹ The highest prevalence of diabetes is found in those above 80 years of age, a number expected to reach 40 million by 2050. Elderly diabetics consume 40% of skilled nursing days and 29% of home health visits.¹⁰ The high prevalence of diabetes among older adults has also contributed majorly to the unsustainable growth of healthcare costs in the US.¹¹ According to the American Diabetes Association, 1 in 5 health care dollars is spent caring for people with diabetes.¹²

Timely medical intervention is the most effective solution for successful diabetes management, both from the cost and the outcome perspectives. RPM can facilitate this crucial step in senior diabetics by keeping track of their daily glucose levels, whether at home or in an assisted living community. If the patient's levels exceed a threshold value, automated communication, using an integrated UC system, can be sent to healthcare providers. They can then suggest timely action to the nurse or directly interact with the patient using the secure mobile UC application, thus helping to avoid a physical visit to the physician or a hospital emergency.



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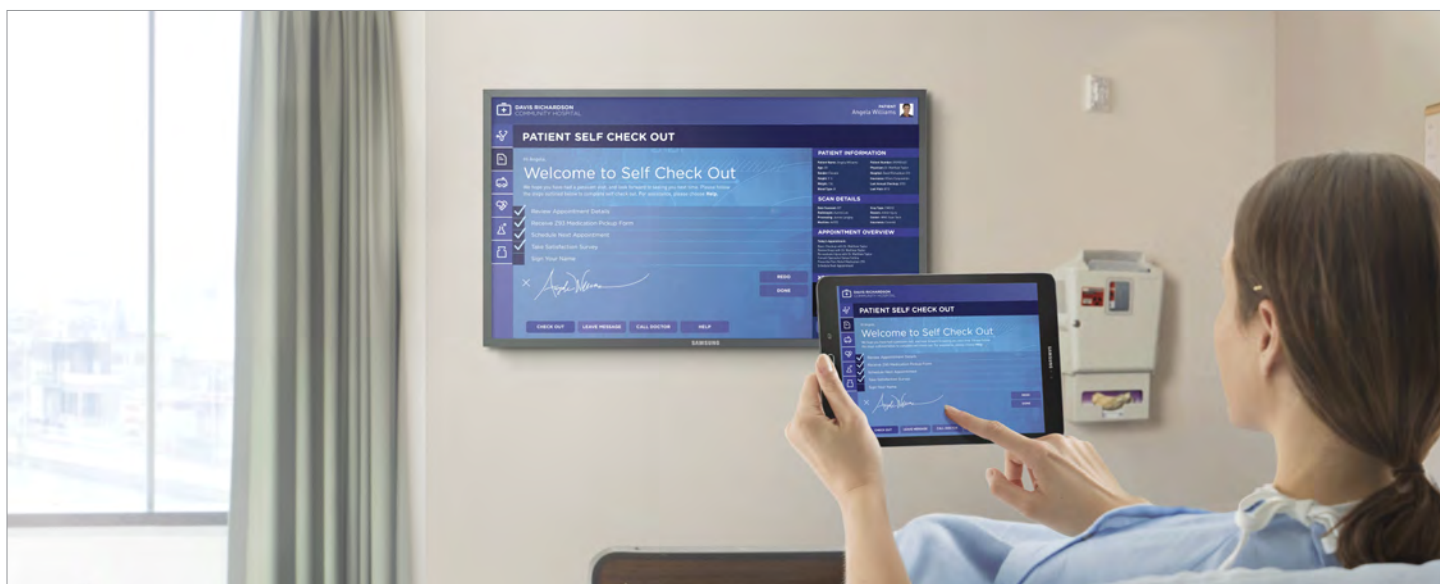
9. <http://www.diabetes.org/diabetes-basics/statistics/>

10. <http://serenagroups.com/diabetes-america/index.html>

11. <http://care.diabetesjournals.org/content/39/2/308>

12. <http://www.diabetes.org/diabetes-basics/statistics/infographics/adv-staggering-cost-of-diabetes.html>

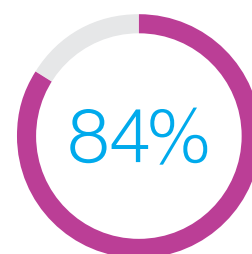
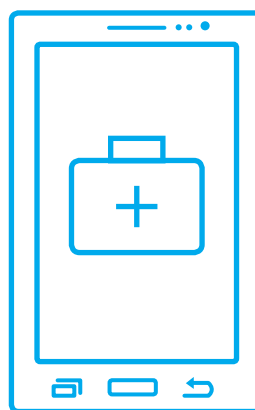
Mobile Health – Connecting Patients and Care Providers



Mobile health (mHealth) extends beyond chronic disease management. It is primarily about connecting patients with care providers in multiple and meaningful ways. mHealth supports healthcare providers and public health practice through mobile communication devices such as cell phones, tablet computers, and PDAs. Applications of mHealth can range from targeted text messages promoting healthy behavior to wide-scale alerts about disease outbreaks. Once patients have access to technology that helps them monitor their health, mHealth is the connectivity bridge that links the patient to the healthcare provider.

New developments in mobile nurse technology such as tablets, smartphones and wearables are totally changing the delivery of bedside care in hospitals. Instead of remaining dependent on dated gadgets like computers, pagers and landline phones, nurses can now use mobile solutions to communicate with colleagues and

access required health information, from any location and at any time, to deliver immediate care. Mobile technology tools and devices also facilitate better patient handing-off during shift changes, thereby ensuring patient safety. Doctors are also adopting mobile devices in a big way. According to a Kantar Media study conducted in March 2015, 84% of US physicians polled reported using smartphones for professional purposes.¹³



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13. <http://www.emarketer.com/Article/Mobile-Officially-Staple-Doctors-Office/1012271>

2 Leveraging Wi-Fi to Improve Patient Outcomes



Wi-Fi is enabling modern healthcare technology, resulting in smart aging and substantial savings. The growing emphasis on delivering healthcare services electronically is driving significant increases in the use of wireless networks. Clinicians are adopting tablets as a tool for mobile patient management even as most other medical equipment is rapidly getting Wi-Fi enabled so as to transmit patient data electronically. Patients and visitors in a senior care community come with their personal smartphones and laptops, expecting availability of robust wireless connectivity.

Mobility is definitely making healthcare better. Wireless solutions sending interactive patient records to the bedside are helping improve patient outcomes. Streaming videos of patient symptoms to doctors in another wing are helping both doctors and nurses to get more work done. VoIP over a wireless

LAN is providing easy internal calling to large organizations such as hospitals and senior living or care communities. Presence of a strong Wi-Fi network and Internet connection encourages family members to visit a senior relative at a community, letting working adults stay in touch with their work and with their own families.

With the rising adoption of mobile VoIP and UC, over-the-top mobile applications, and the fact that all major mobile service providers in the US have launched Wi-Fi calling, multi-media optimized Wi-Fi is more critical than ever for senior care communities to assure a high-quality real-time voice and video communication in every part of the community. Deploying a community-wide wireless LAN network with far less infrastructure disturbance than either wired or conventional wireless can be an important service differentiator.

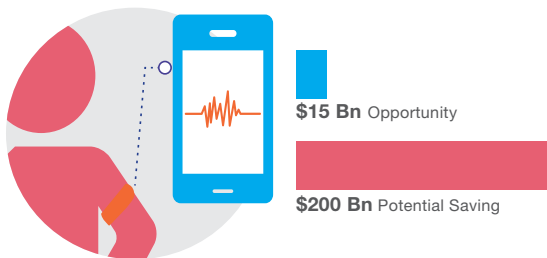


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Senior living community owners are recognizing that reliable Wi-Fi is now a key requirement for the tech-savvy, smartphone-using senior market. There is also an implicit relationship between the adoption of EHR by hospitals and the existence of a fast, reliable and secure wireless network. Communities with ubiquitous wireless coverage can easily provide guest access, resident access, and

mobile applications with built-in capabilities to proactively educate patients, collaborate with doctors and nurses, and location based services. Similarly, as applications like VoIP optimized Wi-Fi, UC, medical imaging and EHR require high bandwidth utilization, senior care communities and skilled nursing facilities with existing wireless infrastructure need to boost their Wi-Fi networks accordingly.

Wi-Fi is Enabling Modern Healthcare Technology, Resulting in Smart Aging and Significant Savings

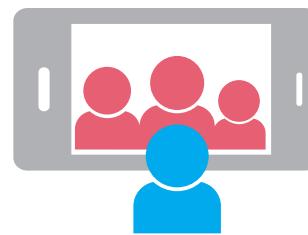
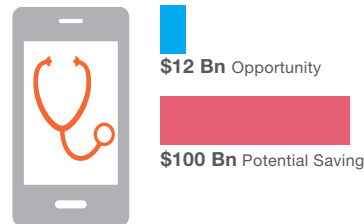


IoT-Enabled Remote Patient Monitoring¹⁴



>55%

Of senior living communities have social connectivity¹⁶



26%

Of senior living communities have resident access to video conferencing¹⁶

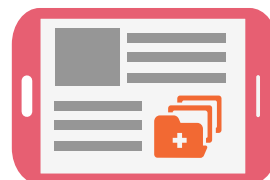
28%

Reduction in emergency visits by senior residents through Telemedicine¹⁵



>55%

Of senior living communities have Electronic Point of Care¹⁶



>75%

Electronic Medical Records adopted by senior living communities¹⁶

14. <http://www.scbio.org/resources/Documents/Internet%20of%20Things%20-%20Volume%205%20-%20The%20Digital%20Revolution%20comes%20to%20US%20HC%20-%20Jun%202029,%202015%5B1%5D.pdf>

15. <http://www.ihealthbeat.org/articles/2016/1/13/study-telemedicine-reduces-ed-visits-in-senior-living-residents>

16. http://www.ziegler.com/uploadedFiles/Insights/Z-News/zNews_Consolidated_11.30.2015.pdf

3 Empowering Senior Care with IoT

Research by Goldman Sachs suggests that IoT-enabled remote patient monitoring can deliver a potential healthcare savings greater than US\$ 200 billion between 2015 and 2025.¹⁷

The crucial value-add that technology brings to seniors is in enabling them to receive physician-monitored healthcare in the comfort of their homes, surrounded by loved ones and in familiar settings. This also translates into a delay or altogether avoidance of a move into a long-term care setting. Leading healthcare providers are therefore recommending the use of IoT-empowered wearables for seniors—to effectively bridge the gap between patients’ homes and their EHRs at the physician’s office, and to help them comfortably age in place.

Statistics show that a lot of elderly deaths are caused due to unusually cold homes in winter. Based on a NCHS report, USA Today reports that winter cold kills twice as many Americans as summer heat.¹⁸ IoT sensors placed around living spaces of the vulnerable population, both in independent homes and in assisted living communities, can collect real-time data on air temperatures and set off automated controls that ensure ambient conditions at all times. These IoT-enabled sensors can also help with fall detection and wander management in seniors suffering from dementia or Alzheimer’s. Older adults suffering from chronic ailments such as severe diabetes, heart disease or other conditions that require close monitoring, can

also enhance their quality of living by adopting wearable devices that send regular health data and timely alerts to their care providers. The cost benefits of implementing home monitoring devices or wearable sensors that connect wirelessly to care providers usually outweighs the costs of medical visits and treatments for patients with chronic conditions.¹⁹



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17. <http://www.scbio.org/resources/Documents/Internet%20of%20Things%20-%20Volume%205%20-%20The%20Digital%20Revolution%20comes%20to%20US%20HC%20-%20Jun%202029,%202015%5B1%5D.pdf>

18. <http://www.cdc.gov/nchs/data/nhsr/nhsr076.pdf>

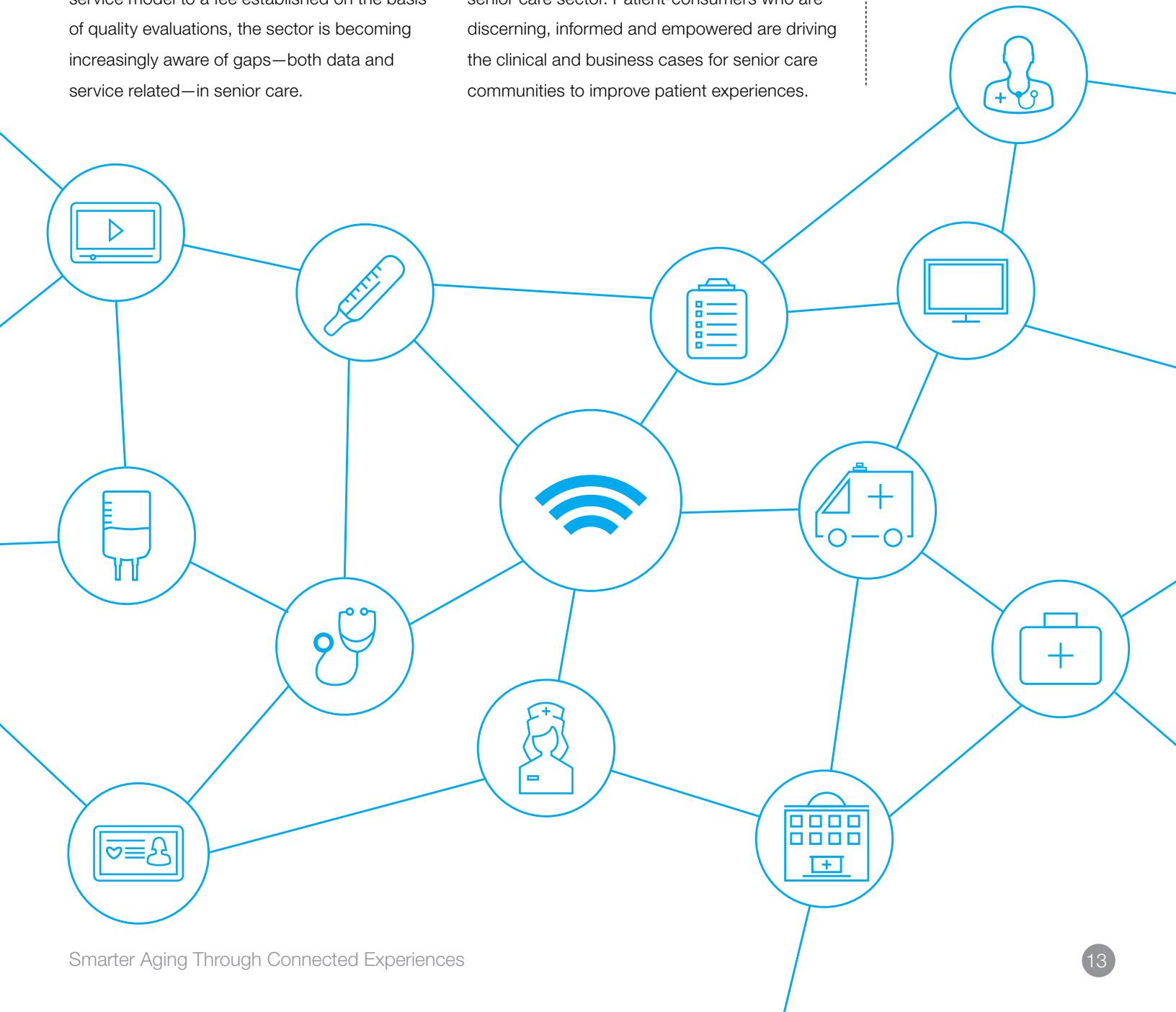
19. <http://www.himss.org/ResourceLibrary/mHimssRoadmapContent.aspx?ItemNumber=30273>

Conclusion

The senior care market is getting particularly competitive. As a result, those senior care communities and skilled nursing facilities that nurture positive environments by providing residents with diverse, enriching opportunities are going to gain a definite edge. However, the biggest market differentiator will be the quality of care available at these communities. With the healthcare sector moving from a fee-for-service model to a fee established on the basis of quality evaluations, the sector is becoming increasingly aware of gaps—both data and service related—in senior care.

What both IT and healthcare providers need to work around are the interoperability issues that are seen particularly affecting the sector. The ability to seamlessly share and use information across multiple technologies is especially relevant to the senior health care and skilled nursing ecosystem. At the end of the day, patient experience is the most significant quality measure that is setting new benchmarks for the senior care sector. Patient-consumers who are discerning, informed and empowered are driving the clinical and business cases for senior care communities to improve patient experiences.

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How Wi-Fi is Empowering Senior Care Providers to Enhance Patient Experience

Better care starts with better connectivity. 's goal is to provide senior care and skilled nursing providers the best performing wireless network—seamless mobility and a high-quality multimedia communication and collaboration—enabling the best experience for seniors. Wi-Fi solution is expressly tuned to provide uninterrupted full-scale mobile coverage everywhere in the community—inside and outside. It is engineered for dramatic boosts in bandwidth, throughput and quality of service even under demanding conditions.

Wi-Fi and UC are becoming imperative to keep seniors happy and satisfied, while enabling optimum utilization of resources. The mobile UC and Wi-Fi solution is designed keeping in mind the mobility and security needs of seniors. The aim is to simplify life connections by enabling a richer and fuller connected experience for seniors. This results in senior care providers achieving a competitive edge as they are more likely to see

healthier and happier customers, resulting in longer stays and business referrals. Further, it helps them gain operational efficiencies by leveraging Wi-Fi-based applications for remote energy management, electronic point of care, location tracking for wander management and electronic health records.

IoT Wi-Fi access point solution is the perfect engine to drive IoT-enabled medical telemetry applications. The high-performance high-throughput wireless solution facilitates automatic, reliable and uninterrupted connection to a centralized device and promptly communicates triggers and alerts so as to initiate clinical action. The IoT Wi-Fi access point solution also provides IoT services such as location-based services and smart building services through wireless connectivity among sensors by integrating Bluetooth Low Energy, ZigBee and WLAN data service at the same time.



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Why Wireless Enterprise?



Enabling technology to drive better health, fitness, education and entertainment



Enabling care givers to remotely monitor residents' health



Keeping seniors connected with high quality voice and video communication over Wi-Fi



Enabling seamless mobility for IoT-enabled life-sustaining applications



Assuring maximum safety by wirelessly connecting real-time sensors and location tracking devices



Improving business productivity by securing access to back office applications on the go