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Productivity in the Healthcare Sector Meetings

1. Overview of Productivity Challenges in Singapore's Healthcare Sector

According to Channel News Asia special report on budget 2014 "Healthcare spending to hit S\$12b by 2020", projected government healthcare spending is increasing faster than what was previously forecasted. From S\$4 billion spent in 2011, it is now estimated to increase to S\$12 billion by 2020. Predicted costs for 2015 have been revised to S\$8 billion in government spending for healthcare, demonstrating an increase that will arrive at the 2020 estimate at least a year earlier. Adding to the challenge is that an estimated one million Singaporeans will reach retirement age in 10 to 20 years.

Accepting that inexpensive or free healthcare does not exist is the first step towards efficient productivity in the healthcare field. Costs are eventually covered by the public through taxes and excessive insurance premiums. Advanced medical treatments that deliver a better quality of life should be available as people age.

The goal of keeping healthcare costs affordable while providing and/or receiving essential medical care is attainable using a strategy that rebalances the healthcare system structure with a cost-effective method of care. Hence, the answer to challenges in healthcare, especially with more retirees in 10 to 20 years, is an improvement in productivity (i.e. effectiveness and efficiency) in the sector.

2. What are the barriers to healthcare productivity?

Each year, the Health Research Institute in the USA surveys 1000 USA consumers and interviews industry experts to identify the top health issues for the coming year. We highlight some key barriers for 2015 below.

Firstly, the lack of co-operation and failure to do testing by consumers is a major barrier to cost reduction. Consumer response to a Health Research Institute (USA) 2014 survey indicated that only 1 out of 5 would use a home urinalysis device.

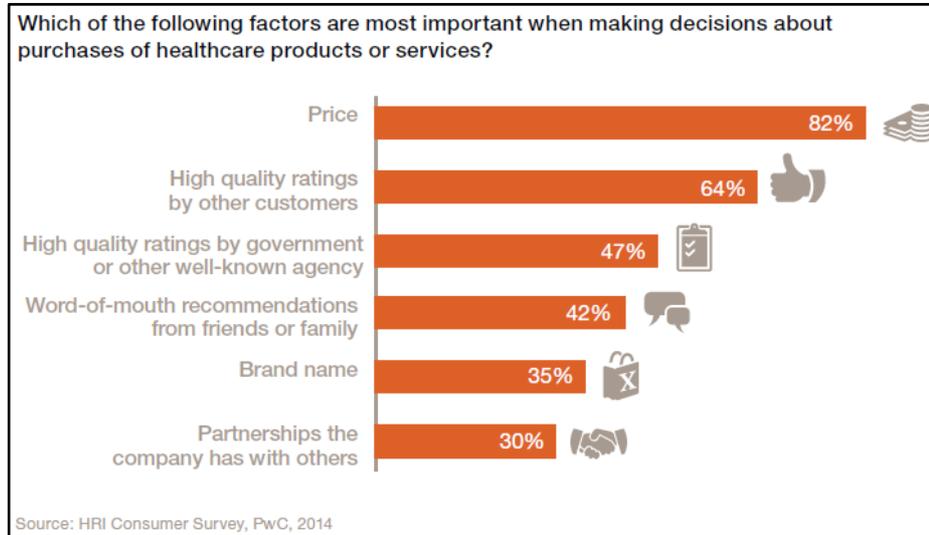


Figure 1: Consideration factors in purchase decision

Source: http://www.pwc.com/en_US/us/health-industries/top-health-industry-issues/assets/pwc-hri-tophealthcare-issues-2015.pdf

Another barrier is the huge amount of data that will be sent at any time day or night. Health information technology needs open and secure programs to handle data streaming. It is a big challenge to find the right balance between convenient access to data and privacy of data.

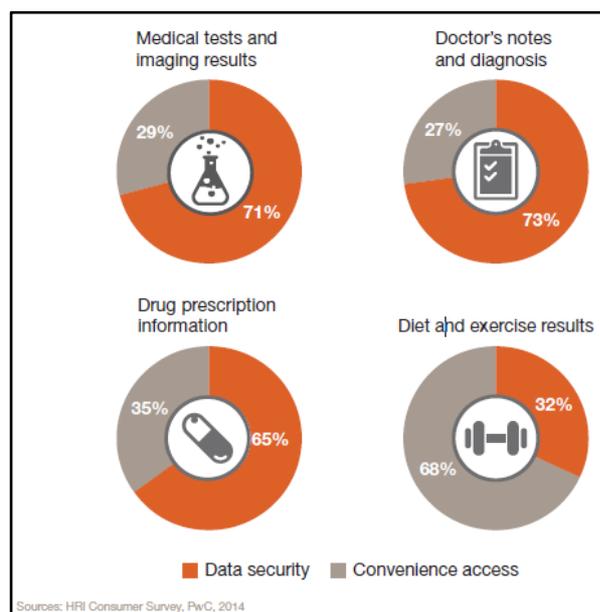


Figure 2: Which is more important, data privacy or convenience?

Source: http://www.pwc.com/en_US/us/health-industries/top-health-industry-issues/assets/pwc-hri-tophealthcare-issues-2015.pdf

Thirdly, doctors may be reluctant to accept data done outside the confines of practices, labs, and hospitals. Giving up control in exchange for useful real time cardiac patient data such as respiratory rate, heart rate, skin temperature, activity, and electrocardiography is advantageous for the patient and doctor. Regardless of the location of either party, a clinician can quickly determine and react to any problems, improving medical treatment up to the point of saving the patient's life with early intervention.

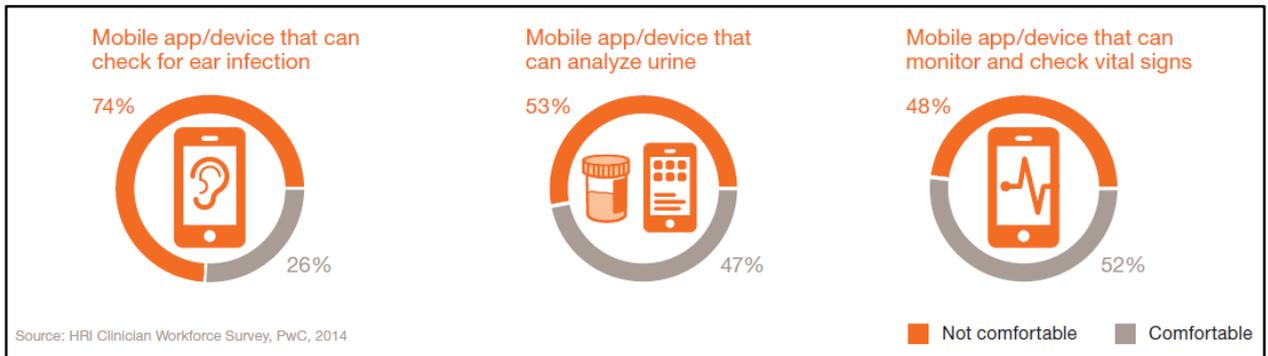


Figure 3: Readiness of US Clinicians using mobile technologies

Source: http://www.pwc.com/en_US/us/health-industries/top-health-industry-issues/assets/pwc-hri-tophealthcare-issues-2015.pdf

3. How do we overcome the barriers to healthcare productivity?

Overcoming barriers to healthcare productivity involves change by medical personnel and organisations, starting with an analysis and review of personal and departmental habits and procedures. Patient use of personal health kits will be more effective if medical personnel explain each feature, how to use it, and its purpose. Familiarising the patient with testing will ensure the data sent in is correct.

One preoperative clinic discovered patients spent approximately 7.5 hours at the visit. Visiting various departments for tests resulted in walking about 493 steps. Individuals facing knee or hip replacements suffered greatly. Hospital staff evaluated how to reduce the length of the visit and amount of travel. The result was an average visit of 1 to 2 hours and 246 steps. Instead of patients going from room to room, professionals visited them in one area when possible. Respect for patients determined the willingness of personnel to change the traditional program.

Efficiency in the work area increases productivity and job satisfaction. Any activity that uses time, space, or resources without contributing directly to satisfying a customer's needs is waste. Waiting, overproduction, and defects are examples of waste that can be eliminated or greatly reduced by evaluating daily operations and thinking of ways to streamline activity and increase job and customer value.

The patient must also buy in to changes designed to reduce or eliminate wasted time and materials. Reviewing data and specimens once they are received and letting the patient know the results as soon as possible brings about the value of any self-testing or records.

4. How do we leverage technologies to enhance healthcare productivity?

According to Fard Johnmar and Rohit Bhargava in their new book, "ePatient 2015: 15 Surprising Trends Changing Healthcare", digital technology is poised to tackle healthcare's biggest challenges, such as

skyrocketing costs, ineffective practice of generic, or non-personalised medicine, and limited social support for patients in the following ways:

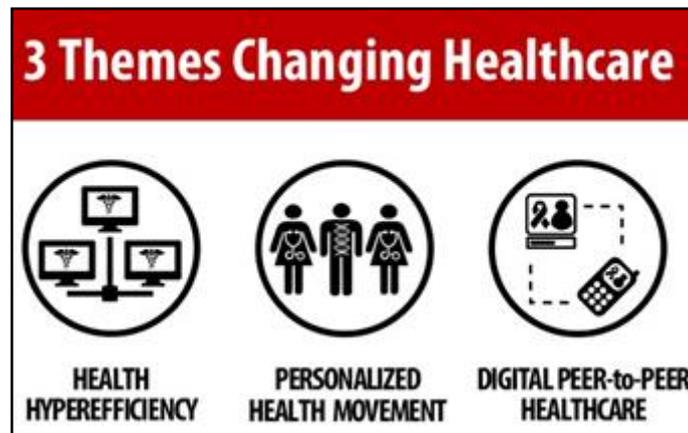


Figure 4: Key Themes in Changing Healthcare

Source: <http://hitconsultant.net/2013/12/12/epatient-2015-15-surprising-trends-changing-healthcare/>

Health Hyperefficiency: Electronic health records (EHRs), clinical documentation tools, and telemedicine devices are documentation tools that could be used collect data for making large scale predictions regarding population health. Predictive Psychohistory, supported by data collected by Predictive modeling, has the potential for reducing healthcare costs and enhancing disease management efforts.

Personalised Health Movement: A wide range of wearable health devices and applications is now available to support the personalised health movement. This is poised to take off in a big way when barriers (e.g. complex to use, high costs and culturally insensitive) to use are addressed.

Digital Peer-to-Peer Healthcare: With the convergence of web, mobile, and social technologies, patients and care givers can navigate new health insurance landscape, select providers, research treatment options, and seek out avenues of social interaction and support.

The introduction of the New Health Economy is bringing about a huge expansion of personal medical kits in 2015. This enabler is a direct response to people looking for a more convenient way to have necessary tests done while providing a lower cost for care. Mobile medical devices and apps for iPhones and Smartphones will allow testing anywhere as they monitor vital signs, track medication use, and analyze urine and blood. The kits are high-tech enough to flag early signs of trouble and diagnose illness. It puts the public in charge of personal care while participating in personal health plan. Rehabilitation and recovery can take place closer to home because clinicians can monitor their patients from a distance or in lower-cost settings, such as a clinic rather than a hospital.

Health systems in the United States are providing cost-effective options to their customers. Spectrum Health System in Grand Rapids, Michigan offered 30 frequent visitors to the Emergency Rooms (ER) the opportunity to visit primary care physicians within walking distance of their homes. ER visits fell by 90 percent while treatment costs dropped from \$1.1 million to under \$130,000 in a year. Implementing innovative strategies is one method of cutting costs without cutting quality of care.

High-cost patients represent 1 percent of all patients in the U.S. However, 20 percent of the nation's healthcare spending goes to that small number. Systems are being developed to follow and manage treatment and expense. Telemedicine and other virtual care techniques reduce visits to the doctor and ER. Clinicians, care coordinators, and social workers call or visit the patient. Known as 'hot spotting', the personal attention encourages a pattern of following the doctor's health guidelines.

Approximately 1 out of every 5 residents in the nation will be 65 or over by 2030. That leaves little time to evaluate and incorporate ways to provide quality healthcare while reducing costs and eliminating the need for constant visits to the doctor's office, clinic, or hospital.

Unconventional care partners include tradesmen who build ramps as safe measures to guard against falls, and retail-based clinics that are nearer to and less expensive than routine facilities. Remote monitoring is a technological boon to patients that need constant testing, yet have no transportation.

Robotic devices for mobility help patients return home more quickly while reducing the costs of long-term care. Robot-assisted recovery and rehabilitation for patients affected by amputations or brain and spinal cord injuries are an example of leveraging enablers through robotic and human collaboration.

5. What are the possible immediate actions?

The possible immediate actions to eliminate healthcare productivity challenges include the following:

Digitalisation has already made an impact on the medical community and patients. Technology increases accuracy in diagnosis, care, and follow-up of patients. Consider changing established routines to leverage digitalisation to reduce operational costs.

Healthcare companies need to understand what patients want as well as determine the best way to give it to them. Instead of making decisions for the public they intend to serve, surveys and focus groups will provide the companies with a realistic view of consumer expectations. The answer could be as simple as looking at what the competition is offering and then evaluating their own assets to see if they can do the same with the technology currently in place.

Cost-effective services can be determined based on elementary criteria such as required investment, created value from the service, and an estimate of patient demand. The service should improve an aspect of healthcare delivery.

Change should be made when it is needed rather than when it is wanted. Offering an app to remind the patient when it is time to take medicine or check blood pressure can motivate the user while building a customer base if it is found to be useful. Adding new services prompts patients to continue to learn how to use the latest technology to their benefit.

Familiarisation with a brand builds loyalty. Higher value complex services such as mobile health records and integrated-care companion apps are items that should establish the company's niche and deliver a following. Instant development of technology designed to appeal to the customer while eliminating challenges to healthcare productivity through their use is an innovative way of being the leader in this essential goal.

Case Study

Case Study 1: Singapore Study – Tan Tock Seng Hospital Outpatient Pharmacy Revamp

The Outpatient Pharmacy is one of the busiest sections of the clinic or hospital. Pharmacy staff spend hours selecting and packing the right medications, after which the various prescriptions for the customer are put together for pickup. A revamping of this method at Tan Tock Seng Hospital (TTSH) Outpatient Pharmacy heralds an advanced process that increases department healthcare productivity, better utilizes personnel, and reduces waiting time for patients.

The procedure combines human confirmation and technical creation. Once the prescription orders are verified and confirmed in the clinics in the upper floor, robotic armatures in the lower floor pharmacy pick medications from automated dispensing machines and pack them so the bag is ready when the patient arrives at the counter. Baskets filled with prescriptions move along a conveyer belt until the pharmacist verifies the patient's identification. The correct basket is retrieved and the patient is given medication counseling.

Expectations are high. Efficiency is improved by ending needless waiting. Safety is secured with zero preventable errors. Productivity is enhanced because needless re-work is non-existent. The Outpatient Automation System (OPAS) is perhaps the region's first highly integrated, extensively automated Pharmacy System.

OPAS, the key enabler, came about because of collaboration between TTSH, National University Hospital (NUH), National Healthcare Group Pharmacy (NHG) and Integrated Health Information Systems (IHIS). The Ministry of Health also provided support. Strategically integrated robotics and technologies around the world recognize the automated, seamless medication dispensing process of OPAS.

Robotic armatures are typically used in car manufacturing industries. This is the first time they are used to enhance healthcare productivity by increasing the capacity to accurately fill prescriptions and significantly reduce patient waiting times. NUH has similar expectations with their use of OPAS. They anticipate increased staff productivity in areas such as medication safety and additional time interacting with patients. NHG Pharmacy expects OPAS to provide more time for staff to counsel patients and review the medications they receive.

Case Study 2: Healthcare Productivity in American Hospice Care

It is estimated that American Hospice Care, Medicare, spent nearly \$170 billion in 2011 for the last 6 months of patients, although much of that amount did not extend life. Medalogix Bridge is a technology that leverages predictive analytics to identify hospice eligible patients. That data provides a workflow allowing clinicians to better manage the patients through the hospice decision as well as the transfer process. A large home health and hospice provider in Alabama increased hospice eligibility recognition by 62 percent and patient review by 89 percent after using Medalogix Bridge for 6 months.

The majority of senior citizens in America want to die at home with their loved ones around them rather than in a hospital. Statistics indicate only 25 percent are granted this wish. Home health providers teach patients about hospice benefits. Identifying eligible patients typically involves researching data in a multitude of patients' files and making a judgment call based on their own expertise and intuition. Medalogix Bridge increases healthcare productivity by freeing clinicians to

care for patients. Meanwhile, the program adds accuracy and precision to decision-making using analytics and automated patient record screening.

Transfer procedures can take the average 25 days before a patient is transferred to hospice. It is possible that the loved one might die away from family and home before the process is complete. End of life care decisions can be reached between patients and families with the streamlined Medalogix process.

Medalogix lists reasons a patient would benefit from hospice based on its hospice eligibility form. Approximately 1100 patients per month were reviewed by the clinical team at the home health and hospice provider prior to Medalogix. Thirty days after system installation clinical patient review increased by 89 percent. Review time of each patient record dropped from 90 minutes to 7 minutes and 33 out of every 100 patients were transferred rather than the previous 8 out of every 100.

Barriers to this technology's use include the requirement of providers to change their processes quickly. All levels of an organization must agree to the change and then use it. Wishes of senior citizens will be granted and funds used in a beneficial way for end of life care.

6. Conclusion

Being aware of the challenges and what solutions are available out there is a good start to improving productivity in the healthcare sector. Seeking partnerships to leverage the technologies across the value chain of patient care may be a win-win strategy that healthcare providers could consider to reduce the barriers to technology adoption.

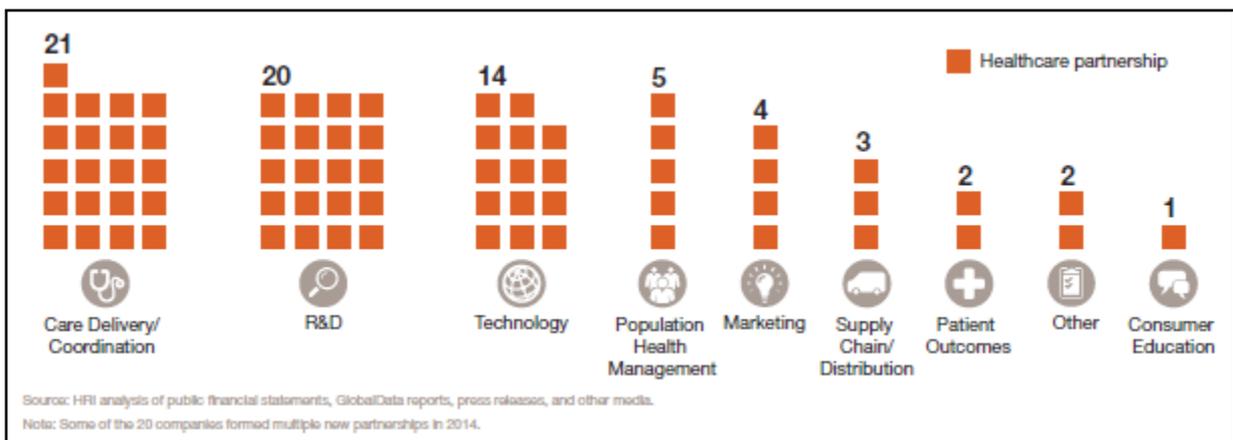


Figure 5: Collaboration is Key

Source: http://www.pwc.com/en_US/us/health-industries/top-health-industry-issues/assets/pwc-hri-tophealthcare-issues-2015.pdf

Recommended Readings

Title: Leading the Lean Healthcare Journey: Driving Culture Change to Increase Value
Author(s): Howard Jeffries, Pat Hagan and Joan Wellman
Publisher: New York CRC Press
Year of Publication: 2011
Accession Number: 350126
Database: EBSCOhost eBook Collection
Remarks: Please log-in via <http://search.nlb.gov.sg/>

Title: Transforming Health Care: The Financial Impact of Technology, Electronic Tools and Data Mining
Author(s): Phil Fasano and Jack Cochran
Publisher: Wiley
Year of Publication: 2013 ISBN 9781118416785
Database: OverDrive Read
Remarks: Please log-in via <http://search.nlb.gov.sg/>

Title: The Toyota way to healthcare excellence : increase efficiency and improve quality with Lean
Author(s): John Black with David Miller
Publisher: Chicago, IL Health Administration Press
Year of Publication: 2008 ISBN 9781567932935
Call Number: R362.1068 BLA
Remarks: Please check availability via <http://search.nlb.gov.sg/>

Publications which are in the holdings of the National Library or Public Libraries are denoted by [call number] at the end of each reference. Please check the library's online catalogue to confirm the availability.

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