Decreasing Medical Incidents and Enhancing Patient Quality of Care with Deltapath Acute

Gunma University Hospital Case Study

Developing Strategic Solutions to Support Healthcare Professionals and Creating A New Standard in Care That Solves Some of The Largest Healthcare Issues

Introduction

Gunma University Hospital, founded in 1949, is located in Gunma, Japan. The hospital has 723 beds and 1500 employees who serve approximately 2117 outpatients and 586 inpatients every day.

Gumna University Hospital's social mandate to contribute to world prosperity and human welfare is making a big impact in healthcare. First, the hospital's Heavy-Ion Medical research center is the first in Japan and it is recognized as a place of excellence for cancer research and treatment. Second, Gunma University Hospital updated its IT infrastructure in recent years to pave the way for the introduction of new medical processes, solutions, and the use of smartphones by staff. "My interest is to decrease medical incidents and enhance the quality of care by using more flexible information systems or integration of medical servers or medical devices," stated the Deputy Chief of Systems Integration Center at Gumna University Hospital, Dr. Kota Torikai.[1]

Challenges

Traditionally, one of the most pressing questions healthcare facilities ask is how to store large volumes of healthcare data. With an updated infrastructure where data storage is not an issue, Gumna University Hospital turned its attention to preventing medical incidents. Specifically, to prevent medical incidents, healthcare professionals need to accurately and in a timely manner diagnose and treat patients' conditions. To do this, Gumna University Hospital believed patients' clinical data must be readily accessible to healthcare professionals. While healthcare staff were using smartphones to communicate and collaborate with each other about their patients, important patient medical records were out of reach because they were only accessible from specific hospital terminals.

In addition, clinical laboratories run a large number of labs every day. "Panic values are one of the most common medical data we look for," stated Dr. Torikai.[2] Dr. George Lundberg who is credited with the concept of critical values published an article in 1972 titled, When to Panic Over an Abnormal Value. Lundberg stated panic values are "those laboratory values which reflect pathophysiologic derangements at such variance with normal as to be life threatening if therapy is not instituted immediately."[3] Dr. Torikai stated, "Doctors should promptly take action once a panic value has been detected. However, doctors can't answer phone calls at their desks if they are engaged in other operations. As a result, the emergency from the laboratory technician may be neglected…As a result, we must make good use of the personal smartphone to solve this problem."[4]

Gumna University Hospital faced another obstacle. On its initiative to discover solutions to prevent medical incidents and enhance patients' quality of care, it would be necessary for all new solutions to keep the clinical data being shared private and secure. "Hospitals are special cases because the information being communicated is strictly medical. Keeping this information private and secure is high priority," stated Doctor Torikai.[5]

Moreover, communication is the cornerstone of efficient and effective medical practices. Whether you work in a long-term care facility or hospital, healthcare professionals need to continually send and receive information pertinent to patient care. However, these environments present challenges. Having a smartphone to communicate is great until you realize you are breaching patient privacy when speaking in the hall where everyone can hear. Dr. Torikai clearly understood this when he said the hospital plans to, "integrate smartphones with text communication or notification."[6] In addition, alerts and notification messages on a smartphone are typically triggered either through Google Firebase Cloud message (FCM) or Apple Push Notification service (APN). Gumna University Hospital was concerned this process could pass confidential patient information to the cloud in order to trigger a notification, violating privacy laws.

Complicating hospital issues is the aging population, which has become a world issue. The ratio between patient and healthcare professional is steadily increasing straining healthcare professional – patient relationship, which is the cornerstone of the healthcare industry. A solution that could improve quality of care by responding to patients' needs faster and preserve or improve the relationship between patients and healthcare professionals was necessary.

Solution

Deltapath introduced Gumna University Hospital to Acute, its healthcare application that can be downloaded by iOS and Android smartphone users. Acute is designed to integrate tightly with hospital systems and services and provide cutting edge technology that aids with monitoring, detection, notification, and communication.

Deltapath integrated the hospital's medical record system with Acute then integrated and optimized CareCom, the nurse call system used at Gumna University Hospital. Unlike traditional nurse call systems that only send an alarm to a nurse call station or send a general notification to a phone when a patient presses a button, integration with Acute changed the way the nurse call system worked. With Acute, anytime a nurse call button is used, healthcare professionals receive real-time information on their smartphones along with critical patient information such as the button that was pressed and the patient's room number and name. In addition, healthcare professionals now have immediate access to a patient's clinical records. Having all the patient's information in one place, means patient quality of care improves because healthcare professionals can respond to any situation faster. Medical errors that are a result of a lack of medical information are also eliminated.

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To accelerate the use of the smartphone already available to staff, each time a patient presses a nurse call button, a call is placed to a predefined group of healthcare professionals on Acute. A healthcare professional speaking to a patient positively impacts quality of care and achieves a number of goals: patient's needs are clearly established, instructions are delivered immediately to the patient, patient is aware someone is on the way to help, and therapeutic words can be used to calm a patient or to provide a sense of security. Equally important, when patients' requests are communicated in Acute, healthcare professionals can reduce the number of steps it takes to accomplish a task. Instead of first going to a patient's room or a medical terminal to learn that a patient needs a new IV bag, a healthcare professional can now arrive at a patient's room with an IV bag. Cutting down the overall number of steps healthcare professionals take each day can greatly reduce exhaustion in an industry where employees work very long shifts.

Understanding that team collaboration is essential for providing excellent patient care and saving lives, Deltapath bundled Acute with different communication modes. Acute allows healthcare providers to extend communication with video calling. If patient privacy is an issue, Acute offers healthcare professionals the ability to text. Texts can also be facilitated with images. When a situation demands immediate attention and collaboration, healthcare professionals can use Push-to-Talk to engage in instantaneous voice communication with one person or a group of people. To protect patients, encryption is enforced on every communication channel on Acute. Furthermore, Acute is designed to flex. It can use Google FCM and APN to relay alerts/notification messages, but the app can also receive alerts in a closed network without internet access to guarantee data privacy.

To further improve patient's quality of care and improve workflow for healthcare professionals, Acute integrated Lead's Panic Value System (La-cPro). A notification is sent to a group of healthcare professionals when the panic value system detects that a patient may need lifesaving treatment. Healthcare professionals can check a patient's lab numbers directly on Acute, acknowledge receipt of the notification, and promptly initiate treatment. The primary benefit of this integration is it allows healthcare professionals to be proactive before the onset of a medical situation instead of reactive. In addition, "the communication workload of the past has also been reduced in the clinical laboratory department, and the staff can focus on their routine duties, which not only improves the efficiency of work but also helps in reduction of stress…," said Dr. Torikai.[7]

Finally, Acute was also integrated with the smart mattress. The smart mattress is equipped with sensors that communicate a patient's heartrate, breathing pattern, and sleep/wake status. Healthcare professionals are notified and can communicate with the patient immediately. They can also through various modes of communication proactively engage other doctors and nurses while proceeding to a patient's room, all the while making the patient feel secure and safe by communicating with the patient.

Acute's goal to place everything right at the fingertips of doctors, nurses, and other medical staff ensures medical information is communicated quickly, quality of care does not deteriorate, and patient – healthcare relationship remains strong. "You have excellent technology to develop and integrate within the medical IT infrastructure," stated Dr. Torikai.[8]

Notes

1. Deltapath, "An Insight into the Japan Healthcare Industry with Dr. Torikai and David," YouTube video, 10:47, April 20, 2011, https://www.youtube.com/watch?v=LLWfPT0BvhM.

2. Gekkan Shin-iryo Editor Team, "The Necessary Condition to Improve Hospital Service, Throughput by Actual Alert Function and Total System," Gekkan Shin-iryo, https://www.newmed.co.jp/(accessed September 20, 2019).

3. Christopher Chapman MD, and Christopher Otis MD. "From critical values to critical diagnoses," Wiley Online Library, https://onlinelibrary.wiley.com/doi/full/10.1002/cncy.20158 (accessed September 15, 2019).

4. Gekkan Shin-iryo Editor Team, "The Necessary Condition to Improve Hospital Service."

5. Deltapath, "An Insight into the Japan Healthcare Industry."

6. Ibid.

7. Gekkan Shin-iryo Editor Team, "The Necessary Condition to Improve Hospital Service."

8. Deltapath, "An Insight into the Japan Healthcare Industry."

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Chapman MD, Christopher and Christopher Otis MD. "From critical values to critical diagnoses." Willy Online Library, April 20 2011, https://onlinelibrary.wiley.com/doi/full/10.1002/cncy.20158.

Deltapath, "An Insight into the Japan Healthcare Industry with Dr. Torikai and David." YouTube. Video File. 10:47, Aug 8, 2018, https://www.youtube.com/watch?v=LLWfPT0BvhM.

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USA +1 408 707 3299
NZ +64 9 886 9799
HK +852 3678 9999
JP +81 3 3527 7890
TW +886 2 7728 3099
www.deltapath.com