

# The University of Yamanashi battles COVID-19

## (Part 2)

### Two new challenges: An eight-month-old infant with COVID-19 and a 47-person staff reduction

Opinion

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#### 1. A PCR test for an eight-month-old infant comes back positive for COVID-19

“The PCR test came back positive.” When the medical staff at the University of Yamanashi Hospital heard the news, which went against the prevailing assumptions about the disease, no one could hide their shock. The date was March 31. The positive test was from an eight-month-old infant who had been rushed into the hospital’s emergency room in cardiopulmonary arrest—and that positive test could very well be telling us that the spread of SARS-CoV-2 is stretching farther and penetrating deeper than any of us had imagined.

None of the infant’s symptoms gave anyone any obvious reason to suspect a COVID-19 infection. The patient’s family had been out and about rarely, only for occasional trips to the store. No one in the child’s family showed even the slightest signs of having as much as a cold. The only reason that the University of Yamanashi Hospital’s pediatricians entertained the thought of doing a PCR test was the infant’s chest CT scan. When the infant arrived at the emergency room and the staff on hand had performed a successful resuscitation, the team took a chest CT scan that ended up showing evidence of small, granular shadows in the lung field. There was no way an abnormality that small could trigger full cardiopulmonary arrest, but the attending pediatrician realized that his team was full of valuable personnel with experience saving infant lives—if, by some chance, the patient did turn out to have COVID-19 and someone on the team were to contract it, too, the situation could get dire fast.

The doctor reached out to his team leader and Professor Takeshi Inukai, director of the Department of Pediatrics, about performing a PCR test on the baby. Considering the situation in Yamanashi, where there had only been six confirmed COVID-19 cases at the time, some objected to going as far as performing a PCR test in a clinical

department at that stage; the likelihood of an infection seemed scant at best. Professor Inukai, however, decided to trust his doctor's instincts and order the test.

After it came back positive, the news made national headlines—and ended up pulling 47 medical professionals at the University of Yamanashi Hospital off the front lines. Regardless of the logistical setbacks that ensued, Professor Inukai's decision to conduct that PCR test helped the hospital avert what could very well have been a disaster.

Imagine if the team had gone on caring for the infant without performing a PCR test, completely oblivious to the infection. It would have exposed so many more personnel and patients to COVID-19. It would have made it virtually impossible for the University of Yamanashi Hospital to keep its medical functionality anywhere near normal levels. As Yamanashi's only advanced-treatment hospital, the University of Yamanashi Hospital is one of the few medical institutions in the prefecture capable of admitting patients in severe or serious condition in the event of an explosive infection outbreak. If a situation were to sap the hospital of those crucial treatment capacities, the results could impact the entire prefecture—the community would have precious little medical recourse. With the possibility of a large-scale COVID-19 outbreak now looking increasingly likely by the day, keeping our available medical professionals as safe as possible is essential to maintaining the hospital's ability to combat the disease and provide vital care. Ordering the PCR test for the eight-month-old in our emergency room was the best decision that the team could have made.

## **2. What enabled the University of Yamanashi Hospital to make the diagnosis**

Why was the University of Yamanashi Hospital able to diagnose the infant with a SARS-CoV-2 infection? It all came down to the same decisive factor behind the hospital's diagnosis of Japan's first case of meningitis/encephalitis associated with SARS-CoV-2 (a patient in his twenties), which we detailed in the previous installment: the medical professionals on the front lines were extremely sensitive to the risks in play (see "How quick-acting risk response in late January paved the way for a diagnosis of meningitis associated with SARS-CoV-2").

The reason for that heightened risk sensitivity was the University of Yamanashi Hospital's extensive, institution-wide readiness for a possible COVID-19 situation. Despite not being a designated medical institution for infectious diseases, the University of Yamanashi Hospital converted one of its eleven general wards (a total of 47 beds) into a COVID-19 facility and opened the dedicated ward on February 26. Another factor was the institution's logistical flexibility and capabilities. To create the necessary buffers and meet space needs, administrators brought the hospital down to roughly 80% of its normal operating capacity, equipped an extra ward (vacant since a relocation project in 2015; approximately 50 beds) as a dedicated COVID-19 care center, and launched operations on March 30. From the standpoints of management and finances, the effort was enormous and far-reaching in its impact. The process of shuffling the nursing staff was a monumental task in and of itself; Department of Nursing Director Shiomi Furuya and the head nurses at the various wards barely pulled off the feat, which initially seemed unthinkable. In spite of all that adversity, the University of Yamanashi Hospital rose to the challenge with a clear

sense of its mission—leading Yamanashi’s battle against the outbreak—and its long-standing philosophy of bonding together as “one hospital, one team.”

The hospital’s preparations to meet the crisis head-on were one big part of its ability to make a game-changing diagnosis, but there was one more essential factor: its PCR-testing framework. The University of Yamanashi Hospital Clinical Laboratory Department, at the direction of the University president, has been bolstering its PCR-testing system since late January. The chief objective behind the effort was to prevent in-hospital infections at any cost—and that meant having the requisite testing provisions in place. The Clinical Laboratory Department has taken a variety of measures to ensure that PCR results are ready and out as quickly as possible. By continuing to act on that logical, practical need, embodying the science-first focus that makes university hospitals what they are, the professionals in the field were in exactly the right environment and right frame of mind to make those two crucial diagnoses. Without that sensitivity and commitment to establishing a sound testing framework, I doubt those discoveries would have come to light when they did.

Japan’s PCR-testing framework and its Expert Meeting formulating testing policies have started to come under fire for their shortcomings—and deservedly so. As the last installment argued, Japan’s woefully inadequate testing framework is a national embarrassment, and it remains just that. Even *The Nikkei* came down hard on the government’s testing approach in its April 2 edition, reporting that Japan’s PCR system lagged behind the rest of the world; Japan, according to the article, had only performed 1/17 of the tests that Germany had.<sup>2)</sup> The paltry quantity is one thing—the quality of the testing protocol, too, is bound to draw criticism as well.

### **3. Concerns about close contact shrink the hospital workforce by 47**

The infant’s PCR test came back positive at 5:45 p.m. on March 31. I had just started relaxing at home; it was one of the first times I had left the office at a decent hour in weeks. Then I heard the phone ring. It was University of Yamanashi Hospital Director Masayuki Takeda. As he told me the news, I looked at my dinner on the table and knew that it would be a while before I would get to take a bite. I dropped everything and set off for the hospital, eventually arriving at the Division of Infection Control at 6:15. The room was chaos. Director Takeda, Infection Control Committee Chair Hirota Haro, Department of Pediatrics Professor Inukai, and Department of Surgery II Professor Hiroyuki Nakajima were all there, along with people from the Medical Department of Quality and Patient Safety, all scrambling to figure out who had come into close contact with the patient, call the corresponding personnel to give them stay-at-home orders, and explain to health-center officials exactly what the scope of “close contact” was.

Drawing the line between “close contact” and “regular contact” was virtually impossible. Every conceivable situation was rife with gray zones and judgment calls. The infant had undergone a CT scan before the PCR test showed a positive result—how was the hospital supposed to categorize the patients who had done CT scans after the infant? Had they been in “close contact?” What about the radiologic technologists working the examinations?

Questions abounded. At 9 that night, an emergency liaison meeting of Hospital Executive Committee members and other personnel gathered to talk about urgent topics: whether the Department of Pediatrics would be able to continue operating as usual, for example, and how the situation would impact the Department of Emergency Medicine and ICU. The group also decided to hold an all-hands meeting at 11 the following morning and sorted carefully through all the countermeasures on the table, looking for any possible oversights. For the administration, the crisis came at literally the most hectic possible time—the last day of the fiscal year, with people set to transfer to different departments the next day. But the University of Yamanashi Hospital was ready to cope with the tumult. Since late January, the whole hospital workforce had been readying the facilities and preparing mentally for an emergency. Thanks to that preparedness, the hospital transitioned into full crisis-response mode as the calendar turned to April, averting any major complications in setting up a framework that continues to sustain operations.

In the end, 47 hospital personnel—18 doctors (including residents), 20 nurses, 7 paramedics, and 2 administrative assistants—were determined to have been in close contact with the patient and immediately ordered to stay home from work for 14 days. The restriction ended up putting sizable dents in the operations of the Department of Pediatrics (which lost 8 employees), the Department of Emergency Medicine (which lost 4 employees), and the ICU (which lost 15 nurses). For the University of Yamanashi Hospital, an advanced acute-care hospital, the sudden, severe ICU nurse shortage dealt a blow that hit hard and impacted every clinical department in the organization. The Departments of Pediatrics and Emergency Medicine have recovered largely through the generous assistance of institutions throughout Yamanashi, which have helped keep the University of Yamanashi Hospital's clinical framework intact. My deepest gratitude goes out to all those medical institutions and professionals for their contributions.

#### **4. Future outlook and acknowledgements**

As of April 2, Yamanashi's COVID-19 case count has climbed to 9. That total pales in comparison to the numbers in areas where concerns about exponential growth in COVID-19 case counts are mounting, like Tokyo and Kanagawa. Given that it borders those high-risk locations, however, Yamanashi may very well need to provide its neighbors with medical support, just like it did when streams of patients started making their way off the *Diamond Princess* cruise ship. Steering clear of a systemic medical failure will require more than just "flattening the curve" to stave off exponential growth in patient counts. Also crucial will be efforts to preserve medical functionality, which entails preventing infections among the medical professionals in the field and keeping close contact to an absolute minimum.

The safety of medical professionals hinges on supplies of personal protective equipment (PPE), which, unfortunately, are starting to run dry; hospitals have hardly any left in stock. While the news has been covering mask shortages and detailing efforts to ramp up production on that front, the government also needs to do whatever it can to ensure the availability of the gowns, eye shields, and other components that go into valuable

PPE kits.

Whenever economic activity shuts down on a society-wide level, everything gets harder: raw-material procurement, production, and transportation all hit major roadblocks. Everyone has to find a way through those challenges. We at the University of Yamanashi Hospital are doing everything in our power to navigate our own set of logistical complications, too; making our own gowns out of waterproof fabric is just one of the many stopgap measures we have taken.

The COVID-19 outbreak is now a calamity on a global scale. In addition to collapsing the medical system in Italy, the pandemic has gripped virtually the entire European continent and devastated the United States on its rampant, cross-border surge. As of April 3, COVID-19 has infected over 1 million people and claimed more than 50,000 lives worldwide. As we noted in our first report, the outbreak is forcing Japan to reckon with harsh realities. The government has already decided to postpone the 2020 Tokyo Olympic Games. Big changes are happening quickly. Every last Japanese citizen has to adapt to the circumstances in this national emergency, one with no clear end in sight.

“The risk of developing severe symptoms as a result of COVID-19 is low among young people,”<sup>3)</sup> the Expert Meeting has declared, but that claim is hard to swallow when you have seen what we have in real life: a case of a man in his twenties who developed meningitis/encephalitis associated with COVID-19 and an eight-month-old infant with the infection. Reports from researchers in Wuhan, China, too, challenge the experts’ assumptions.<sup>4)</sup> As a university hospital, we have a responsibility to give people accurate information with a grounding actual clinical findings and the latest research on COVID-19 from around the world—and we will continue to fulfill that duty.

Again, on behalf of the University of Yamanashi, I would like to thank everyone at the University of Yamanashi Hospital, medical professionals across the country, and everyone else working so tirelessly to combat the COVID-19 pandemic. I also want to extend my sincerest gratitude to Yamanashi Prefecture Governor Kōtarō Nagasaki and other prefectural officials for their help in supporting the University of Yamanashi Hospital, medical institutions and professionals across Yamanashi for helping us continue to provide care amid the upheaval of the crisis response, and the Ministry of Health, Labour and Welfare, relevant agencies, and everyone else playing a part in this ongoing struggle.

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