

Preparing for Disaster Mitigation Measures and Business Continuity during Disasters in Hospitals

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Business Continuity Planning Measures

Byoinshinbun Co., Ltd.





Twelve Years after the Great East Japan Earthquake – Lessons Learned for Future Generations

Tripartite talk

Disaster Mitigation Measures and Business Continuity during Disasters in Hospitals



Twelve years have passed since the Great East Japan Earthquake. Dr. Yasushi Nakajima, Director of the Disaster Risk Management Support Center of Tokyo Metropolitan Hiroo Hospital, who was dispatched to the area as a member of the Tokyo DMAT at the time, said that he saw the gap between the disaster response he had pursued and the reality. This was a turning point for him to focus

on disaster mitigation support. Mr. Shigeki Habuka, Executive Officer of Mitsubishi Chemical Group (MCG), who was a secretary to then Prime Minister, Mr. Naoto Kan at the time of the Fukushima nuclear accident, recalls that “the Prime Minister’s Office was confused,” and later became involved in the disaster response efforts of the public and private sectors. Mitsubishi Chemical Aqua Solutions Co., Ltd. has been proposing groundwater-to-drinking water treatment systems to hospitals, and its President Mr. Masakatsu Yasuguchi said, “I think our customers are very satisfied with the system,” because it enables them to maintain medical functions by securing water even when water is cut off due to disasters. He also emphasizes that “efficient use of water resources is really important for Japan that has limited natural resources, and we should be proud of it”. The theme of this issue is “disaster mitigation measures and business continuity during disasters in hospitals,” and we asked each of the three to share their perspectives. (This is a summary of an article that appeared in the March 9, 2023 edition of Hospital News. Editorial Department)

Chimera-like “Disaster Prevention Measures” should be scrapped and return to the essence of what is really needed.

-What motivated you to engage in disaster mitigation assistance?

Dr. Nakajima:

When I was a fifth-year student at Nara Medical University, the Great Hanshin-Awaji Earthquake struck, and I spent about a week volunteering with friends. At that time, I had a strong feeling that disasters were something very “close to home”. After that, I began training as a surgeon, and when the Tokyo ER was established at Tokyo Metropolitan Hiroo

Hospital, I was assigned to the hospital and became involved in emergency and disaster medicine. I joined the Tokyo DMAT and Japan DMAT as one of the first members when they were created, and from that time on, I became fully immersed in disaster response.

In May 2008, I was sent overseas for the first-time official deployment to the Sichuan Earthquake in China. I was

Dr. Yasushi Nakajima

Director, Disaster Risk Management Support Center, Tokyo Metropolitan Hiroo Hospital
Doctor, Ph.D. (Engineering) Japan DMAT Instructor

In 1996, graduated from the Faculty of Medicine, Nara Medical University and completed residency in surgery at Tokyo Metropolitan Komagome Hospital. In 2010, became Chief of Emergency Medicine at Tokyo Metropolitan Hiroo Hospital and retired in 2012. In 2015, participated in ODA projects in ASEAN and Sri Lanka as a development consultant. In 2015, became Deputy Director of Disaster Risk Management Support Office, Tokyo Metropolitan Hiroo Hospital. In 2020, became Director of Disaster Risk Management Support Center, Tokyo Metropolitan Hiroo Hospital (current position). He is mainly engaged in supporting disaster Risk Management and preparedness of medical institutions by developing and disseminating response and educational tools such as Action Cards and “Disaster Risk Reduction Calendar HDMG”, along with planning, conducting and evaluating relevant trainings.



shocked to have experienced the loss of an entire city and to see the number of dead and injured that was a far cry from Japan’s figure. Frankly speaking, I was at a loss as to wonder whether saving one person in this situation would make any difference in the world. It made me feel that I was not even sure who I was that time.

On February 22, 2011, I was also dispatched to New Zealand, as a member of the rescue team for the earthquake that hit the south of the country. Just as I was about to take a breather after returning to Japan, the Great East Japan Earthquake struck on March 11, 2011. As a member of the Tokyo DMAT, I worked with the doctors at Kesennuma City Hospital, hoping to help the situation at the site, which was collapsing, to somehow stay on track. Until that time, my greatest desire was to rush to the scene and deliver medical care, and the only measure of my evaluation was that I could help people there. I had not paid much attention to the difficulties faced by the hospitals in the disaster areas to which we were sending the people we helped.

It was not until I talked with the doctors at Kesennuma City Hospital and worked with them that I really got a sense of what it was like to be a victim of the disaster. The hospital staff were also victims of the disaster, and they persevered and worked hard to “continue providing medical care” despite the loss of their families, possessions, and various other things.

After returning from the disaster area, I began to ask myself a big question. The gap between the disaster response I was pursuing and what is actually needed is so great that I

wonder if the number of people that can be saved will not increase at all even if efforts are made in the same direction we have been pursuing. How much of a role can the Tokyo Metropolitan Hiroo Hospital play in the event of an earthquake occurring directly under the capital? The word “business continuity” is there and known, but there is no know-how on it at all, and we have found that there are many problems.

In the first place, we worked hard in the direction of disaster prevention as a basic premise, but I think it is not possible. Eventually I came to think that we should accept there is damage first, and then for preparation, we should do training on the premise that our own hospital cannot work at full capacity. I thought that this was the reason we had a business continuity plan (BCP). I thought that it would be difficult to go from so-called “disaster prevention” to “disaster mitigation” without going back to the essentials, cutting out all the “chimeras” of disaster prevention measures that have become inconsistent with each other. This is how I came to work on disaster mitigation measures.

Mr. Habuka:

I am very impressed with Dr. Nakajima’s talk. He has been dealing with disasters ever since he was a student and is still thinking about emergency preparedness in this way. I joined the Ministry of Finance in 1981 and have worked to develop institutional systems. However, while systems are important, it is the on-site response that determines the success or failure of the measures in a disaster. I think it is truly wonderful that there are people like Dr. Nakajima.

Mr. Shigeki Habuka

Executive Officer, Mitsubishi Chemical Group Corporation

Born in Chiba, Japan in 1958, graduated from the University of Tokyo, Faculty of Law in 1981 and joined the Ministry of Finance in the same year. In 2005, joined the Ministry of Finance, and served as Director of the Second Taxation Division, Taxation Bureau, Ministry of Finance. In 2008, assumed deputy director-general in Ministry of Defense. In 2011, deputy director-general of the budget bureau of Ministry of Finance. In 2014, Director-General for Policy Planning, Cabinet Office. In 2016, Cabinet Office Deputy Director-General. In 2017, assumed position of executive officer in business planning office of business strategy department of Mitsubishi Chemical Holdings. In 2019, became Executive Officer and General Manager of the Corporate Communications and Investor Relations Office of Mitsubishi Chemical Holdings Corporation. 2020, became Executive Officer of Mitsubishi Chemical Holdings Corporation. 2022, assumes his current position.



Mr. Yasuguchi:

I am from Osaka and was hit by the Great Hanshin-Awaji Earthquake when I was in my fifth year with the company. Our quake-resistant water tanks were safe, but of course the water was cut off, so everyone was having trouble with water. Our job at that time was to restore the water tanks and reinforce them so that they would not break. We mobilized all of our employees from all over Japan and visited all of the locations where we had delivered water tanks in the Kansai region. I remember very well that at a condominium in Takarazuka City where I visited, the reinforced water tank on the roof was damaged but only slightly, and the residents were very happy, saying that even if the water supply was cut off, the water remained in the tank, and they could hold out for some time.

Mr. Masakatsu Yasuguchi

General Manager, Aqua Solution Department, Amenity Life Division, Advanced Solutions Business Group, Mitsubishi Chemical Corporation (and) Representative Director, President and Chief Executive Officer, Mitsubishi Chemical Aqua Solutions Co., Ltd.

Born in Osaka, 1965, joined Mitsubishi Plastics in 1989 and was assigned to the Osaka Branch. In 1999, Facilities Equipment division (Business Planning) of Mitsubishi Plastics. In 2010, Sales Manager of Mitsubishi Plastics Sales Kansai Branch. In 2011, GM of Mitsubishi Plastics Lifeline Division. In 2013, General Manager of New Product Planning division of Mitsubishi Plastics Infracore. In 2017, General Manager of facilities and equipment division of Mitsubishi Chemical Infracore. In 2020, became General Manager of the Sales Support Division of Mitsubishi Chemical Cleansui Corporation. In 2021, assumed his current position.



Hospitals are "local industries."
They need to be connected with each other
to respond to disasters area-wide.

-What are the challenges of the hospital's BCP?

Dr. Nakajima:

Tokyo Metropolitan Hiroo Hospital was one of the first hospitals in Japan to formulate a BCP. I was in the position of receiving the BCP and actually implementing it. So, looking at the plan, I thought "This is exactly the way I wanted".

However, as we worked on it, we began to feel uncomfortable. First of all, healthcare is a public service, so the "B (Business)" in BCP did not fit the meaning, and I was caught up in the definition of the word. For example, in the case of a company's business, there is the option of abolishing or relocating offices in the affected area. On the other hand, any hospital that provides medical treatment is a local industry, and it would be fatal (for the residents) to change the location. The residents would say, if not out loud, "The doctors there abandoned us and fled to a safer place". Then, when we come back and say "Well, it's a disaster, so let's rebuild the hospital", will the residents believe our words?

While "hospital evacuation" is possible as a thought experiment, it is not a realistic option. More to the point, if all the patients are gone, from that moment on we will not be able to receive any money and we will have no choice but

to go bankrupt.

The main thing we have to consider is that hospitals are vulnerable in the first place: they work on an after-hour system for three-quarters of a year, so there are lots of people there during the day, but very few at night. During nighttime, only dozens of staff members are looking after hundreds of beds. Of those dozens of people, 80 to 90% are nurses, and there are almost no administrative staff. There are also a few doctors and zero executives. Then the business continuity we have to do is to make sure that the nurses who happen to be there can do it, and that they can do it without any guidance or decisions from their superiors, and that has to be the first part of the business continuity plan. In addition, I have always believed that things will probably not change even if hospitals work hard on their own. If hospitals do not discuss with each other to cover their strengths and weaknesses, and to think about area-wide disaster response, they may end up saying "It's over" once they become a hospital in the disaster area. This is the challenge in the current BCP from the side of the staff at work.

Establish a business continuity plan with actual disaster strike in mind. Have multiple hospitals conduct trainings with the same protocol.

-Please give us your recommendations in response to such issues.

Dr. Nakajima:

The first thing to do is to create a plan based on the assumption of an actual disaster strike and consequential damage. This may be a weak, or scary, area for the Japanese, and they may not be very good at it. It is important to move away from the mindset of "I will be fine, so I will help others", and to clarify the perspective of oneself as a disaster victim. Next, we have stopped using the three-letter English word "BCP". We used ideographic Chinese characters, such as "medical business continuity" and "business continuity in the disaster area", so that it is easy to understand at once that this is what we are talking about. We decided to change the cover first, because otherwise people would not read the plan. The second thing we did was to make the assumption that "when a disaster strikes, there will be no replacement". We must make the best use of what we have left and provide optimal medical care. However, even though we know conceptually that "we should make good use of what is left", we do not know how to achieve this without training. Furthermore, there is little training know-how, so if each hospital had to deal with it, it would be costly and unsustainable. Therefore, we decided to create a common training program and conduct it at multiple hospitals.

When not only Hiroo Hospital but also Komagome Hospital, Otsuka Hospital, and Bokutoh Hospital, which provide different types of medical care as the same metropolitan hospital organization, conduct training under the same protocol, various issues come up in different areas.



Scene training at a ward at Tokyo Metropolitan Hiroo Hospital (photo taken September 2, 2022, courtesy of Dr. Nakajima).

Suppose that one training per year will usually solve only one problem, but now we do four times. This means that one hospital can have a four-year equivalent growth in one year, and solutions are shared with each other.

As the platforms are aligned, the training itself will start fitting to any hospitals. For example, even in case staff members are reassigned or go to different departments to help them when a disaster occurs, if the OS (Operation System) used is the same and there are only visual differences, I think that mutual support will be a little easier.

"6 km rule" to go directly to the nearest hospital in case of disaster. It is also necessary to unify units and designations.

-What is your current disaster response system?

Dr. Nakajima:

On July 1, 2022, 15 medical institutions, including eight metropolitan hospitals that have been providing advanced

and specialized medical care, six public hospitals that have been taking advantage of regional medical care, and the Tokyo Metropolitan Cancer Screening Center were united



Hiroo Metropolitan Hospital with the Disaster Risk Management Support Center, inaugurated on April 1, 2020.

to become a single independent administrative institution, the Metropolitan Hospital Organization. We decided to take this opportunity to align our disaster response protocols and create a system, so-called "OS", that would allow each hospital to help each other.

We have changed the rule of staff reporting to their own hospitals in the event of a disaster so that the staff can go to another hospital closer to where they are. We call this the "6 km rule", and it has enabled each hospital to secure an initial number of medical personnel without, for example, forcing the staff to walk, say, 20 km (towards their own hospitals).

What I also learned while working on this project is the difference in units and designations used at work. For example, if I say, "I need 'three' of water", It may mean gallons, and the person responding may take it as tons. For example, if a hospital says, "We are in a difficult situation," without any scale-like thing to measure it with, it will be difficult to judge the situation objectively. It can be interpreted in a wide range of ways depending on one's position, and one might respond "Compared to my hospital, your hospital still has more than enough equipment", or conversely, "You should raise your voice and ask for help". Therefore, the 15 medical institutions used the same protocol to make decisions and shared information expressed in numbers on a scale of "0 (okay)" to "4 (to run away)". This way, instead of waiting for instructions from the hospital organization's disaster response headquarters, the staff at each hospital could make their own decisions and take actions: "A hospital of level 1 helps one of level 3, while another of level 2 will stay still to deal with it themselves because they are in the middle on the scale". Of course, there are times when it is important for the hospital organization's disaster task force to take the lead, but if each

hospital talks within the same framework, initial collaboration will be easy to determine. And indeed, such efforts have begun.

-Please tell us about your current training.

Dr. Nakajima:

I have been coordinating training on my rounds since 2015. Tokyo Metropolitan Hiroo Hospital, which specializes in disaster response, does not draw much interest from other hospitals because it is considered "normal" for such hospital to be able to conduct trainings well. However, when hospitals see other hospitals of similar level conducting training, they say, "Maybe my hospital can do it too" and take action. This was an interesting discovery for me. Specifically, we do the same training every year for about 3 years, with the promise that those who are trained in the first year do not have to participate in the second year, and those who participated in the first and second years do not participate in the third year. We make sure that no one escapes the training, but the people joining later tend to be less confident. On the other hand, those who raise hands first tend to be more proactive, and many of them are willing to support those in the second training and beyond. Our ideal training is to experience in advance what we cannot do now, and discover that "we are lacking something here, we did not understand this part well, we interpreted this part in our own way", so it is assumed that things will not go well. Even if the result of the training is the worst, we will move forward with the summary: "If today was an actual day of disaster, the patients might have died. However, if it happens tomorrow, at least we will have a better chance of saving them as long as we don't do what didn't work today. Let's look at the bright site!".

If we explain this to the director of each hospital in advance

and ask him or her to do so, he or she will take the initiative, and those around him or her who see this will follow their examples. This way, the training is rarely disrupted. Everyone is properly involved and they will experience success from there.

Once they realize that "we can do it", they will be more willing to join the train again the following year. In order to make the training last long, it is important to create an exquisite plan that combines a sense of satisfaction from having done something well and a sense of failure, but not too much of it. The know-how lies in the fact that on the day of training, if something looks a bit wrong, we give advice saying, "Perhaps, you can do it this way". It is a world where you can't just hand someone a textbook and say, "Here you go", so you have to work together with them on site to make the training work.

However, after just one training session, everyone becomes

somehow able to do what they are supposed to do, and after about three years, they become confident in doing it on their own. Then, they actively ask questions, and when we suggest potential solutions from others experience, they say, "We'll try it too", and become independent.

In this way, through a system of training, we help hospitals change their internal systems to the point where they are able to operate on their own.

In the future, it would be great if not only I, but also those who have seen and experienced such training together visit training at hospitals that are successfully tackling the challenges to share their experiences with nearby hospitals. By doing so, I think it would be ideal for each hospital to become connected with others to form a stronger network.

Currently, five hospitals are working on the project, and the remaining 10 hospitals will be involved from next fiscal year onward.

Argument of conflict interest and ethics should be done during training, not during actual disaster.

Dr. Nakajima:

However, even after all this work, problems still remain, and hospitals located directly above the epicenter may be forced to "evacuate the hospital". That is just bad luck and out of their control. However, when the number of patients in a hospital is not just a few, but a few hundreds, it will take quite a long time to get everyone out. Of course, we try our best to shorten the time, but in order to fulfill our responsibility of survival of all, we still have to think of a way to get the last person out for us all to survive until the moment when everyone is evacuated from the hospital together. But that is difficult find.

When we get right down to it, this is the most fundamental decision required of the nurses in charge of patients in the wards. Some decide to keep going while others decide to run away. While we appreciate their decisions, we also found that it is very difficult for us to decide to what extent they should continue their effort.

There is where a major barrier comes in. Our usual principle of action is that we all strive to provide the best possible medical care to each individual patient. However, the moment we become a hospital in a disaster area, this becomes impossible, and we must share the mindset of getting by with the minimum amount of medical care.

But it creates tremendous moral conflict. It can be as severe as the situation where I came to think "Will saving one

person ever change the world?" in the Sichuan earthquake. Dr. Tokuo Narita of Kesenuma City Hospital told us that "disaster medicine was a medical treatment that involved a series of compromises and conflicts". I believe that this experience of conflict should not be experienced on the day of a disaster. There is no need to go through this kind of struggle in the midst of even the most painful and frightening situation. We should train ourselves to think about using what we have left with carefully, and that is exactly what we should do in the times of peace. I think it is very important for everyone to think about it at least once, and if possible, to think about it every year, in a completely safe training setting where even if we make a mistake, no one will die.

When disaster strikes, people tend to be heroic (self-sacrificing), like working without sleep. However, when disaster strikes, what is expected of us is to maintain the current system for three years.

Similar to the COVID-19 response, long-term efforts are required. Working their heads off on the first day only will make no difference. What cannot be replaced is manpower, so the most important thing is to make sure that everyone takes decent rest every day. We need to make sure that the people in the disaster response headquarters are aware of the concept of taking shifts to prevent people from becoming exhausted. There is a concept called "disaster utopia," in

which people's goodwill is awakened during a disaster, and for a week or so, everyone voluntarily helps each other, which happens not only in Japan but all over the world. The point is that we should not waste those people's goodwill, but to take them one or two steps forward. Unless the people at the top indicate proper direction, everyone's good intentions will spin out of control. During trainings, I tell the participants, "We don't have time to worry about our staff not working well. Rather, we have to think carefully about how to prevent them from working too much".

We use both water and things carefully. What we gain by doing so is not the water, but the time. With the time we can negotiate to secure water. There are few people in hospitals who are good at negotiating, and they tend to say yes to everything as they are told. In dealing with COVID-19, we were forced to buy masks that were overpriced and not even of medical standard. We also had to wear raincoats to work. None of these didn't really make sense and they can simply be described as "it's better than nothing but does this make sense at all?". After all, this is what happens when we don't have time. In order to negotiate calmly with reason, both time and staff are important, and in order to secure these, we still have to save manpower, things and time.

But the idea of saving manpower, things and time is not part of the daily medical practice. What is required of us is that we should provide best possible medical care to all patients. In order to do that, high costs are unavoidable. So, we cannot tell people to change their way of thinking if they suddenly find themselves in a different world of disaster. Therefore, it is necessary to train people so that they realize when a disaster strikes, they will be transported to a parallel world that is not a continuation of the present world, where they must change their way of thinking. However, if we tell them to change their mindset, they will become stubborn. So my current proposal is to train them to realize the need to change their way of thinking according to the world they will be transported to.

Mr. Yasuguchi:

When I heard Dr. Nakajima's story, I thought he was right. Our company had a disaster simulation while having consultation with a major consultant company. The assumption was that we are members of the disaster response headquarters, and information keeps coming in and the choices that must be made are very tough. For example, "There is an injured person on the floor, how should we take care of him? What should we do if we receive a request for assistance from other parts of the building other companies occupy? To which hospital and how should we take an injured person? etc.." The participants had never experienced anything like this in real

life, and we were under a lot of psychological pressure and they turned pale. I was also shocked and realized that "we are being under strong pressure this much." Dr. Nakajima talked about hospitals, but we, as a company, are exactly the same. I think we should establish a cooperative relationship through proper negotiation on a daily basis with hospitals as to where to take the injured employee. I am really glad that we were able to recognize that we have to be realistic in order to take care of our employees' lives.

Dr. Nakajima

I think that unless we have experienced such scary at least once, we will not be able to tell where we stand objectively. I think it will be a little difficult to respond to disasters unless we, as an organization, have the experience of imagining what will happen when we suddenly shift from a life where water is taken for granted to the one where it is no longer available.

In the case of a hospital with no water, gas, and electricity, one must decide what is to the purpose and reasonable to protect the patients. We cannot overcome difficulties with only ideals alone. So, I am telling as many hospitals as possible that unless they put aside their existing disaster countermeasures and extract and simplify only the fundamental aspects, it will be difficult to change their mind-sets.

-“Tokyo Metropolitan Hiroo Hospital Disaster Risk Management Support Center” is working on such an initiative. Tell us the story behind its establishment?

Dr. Nakajima:

Inviting people to come and speak at a “disaster risk management center” is not going to solve anything. When the attendees return to their hospital, they will be alone, and they will only feel more alone. I came up with an idea that if I, myself, went to the hospital and spoke with many people, the hospital could change and more and more people would be involved.

We wanted to share the know-how that we had gathered with various people from various places, and to create a situation that would be like collective knowledge-source, something that could be used for free. I wanted to express this in words, so I requested the hospital director, Dr. Yasuhito Tajiri, to change the name of the department to “Disaster Risk Management Support Center” with the word “support” in it, and he understood.

However, since the new center was launched on April 1, 2020, it had been a little difficult for us to go outside for lectures, since we had to deal with COVID-19 from the next day. However, only recently it became possible for us to consult with hospitals, and we would like to start working on this slowly from now on.

Water is the most difficult thing to come by in times of disaster. We propose a groundwater membrane filtration system.

-Mr. Habuka was formerly in charge of disaster prevention as a counselor in the Cabinet Office. Please explain the measures at the national level.

Mr. Habuka:

In my understanding the Hanshin-Awaji Earthquake was a milestone in the government's awareness of disasters. It was the first disaster where the damage was extensive and widespread. Until then, the government had focused on disaster response, such as repairing public facilities and infrastructure, but there are now moves to help individuals rebuild their lives. In addition, the Self-Defense Forces were made ready to deploy quickly in emergency situations.

At the time of the Great East Japan Earthquake, nuclear power plant and tsunami created very serious issues. The damage was unprecedented and massive. During the reconstruction phase, the direction was shifted toward providing proper compensation for personal properties as well. In addition, the public and the private sector worked together to establish a recovery system including support to the logistics service with help from parcel delivery services and convenience stores. In a later year, I participated as a government representative in the Global Platform for Disaster Reduction meeting held in Mexico (May 2017), where I explained various policies of Japan to the participants since they showed great interest in Japan. What surprised them most was that the public and private sectors were working together on disaster response. I realized that this was a feature that Japan should pride itself on and was the best in the world.

Then the Kumamoto earthquake occurred in April 2016, and shortly after, in July, I took up the post of Deputy Director General for Disaster Management in the Cabinet Office. What was implemented in the Kumamoto earthquake was a “push” type of response, in which the government proactively made proposals rather than waiting for requests from the affected areas. In the earthquake, the director-generals of the relevant ministries and agencies were dispatched to create a task force within the Kumamoto Prefectural Government. The director-generals gave instructions and set up a system to respond promptly and encourage local governments to work on what was necessary based on the experience of past disasters.

In addition, to ensure proper follow-up, we conducted a survey of residents and municipalities asking, "What are



Groundwater membrane filtration system installed at a hospital in Kumamoto City. Water was provided to nearby residents during the Kumamoto earthquake.

your current problems?" It turned out that the most common concern was "water". Food and daily necessities were delivered from all over the country and were available at evacuation centers, but in the areas where water was cut off and restoration was slow, people were extremely in need of water for daily use, saying "I want to take a bath". I joined MCG in 2017 when I was starting to be aware of such problems. Then, I come to know a project of disaster prevention was underway within the company, and I learned about a system to convert groundwater into drinkable water and a water storage tank with high earthquake resistance and sanitary characteristics. It gave me an inspiration "this is it."

Mr. Yasuguchi:

MCG consists of various businesses and one of them is the textile business. We make very good membranes from these fiber materials, and our groundwater membrane filtration systems using these membranes are being used by hospitals. This business model originally started as a cost-saving measure to reduce water charges by using a hybrid supply of both public tap water and groundwater. However, after the Great East Japan Earthquake and the Kumamoto Earthquake, this system was found to be able to help maintain medical functions even when affected by water

outages. It leads to the continuation of water-intensive medical care for patients undergoing surgery, dialysis patients, etc during the disasters. In one case, a hospital in Kumamoto was able to provide water to nearby residents during the disaster.

Japan has always been rich in groundwater, so we propose the benefits of utilizing groundwater not only to reduce daily water bills, but also to secure water in the event of a disaster.

In the event of a disaster, electricity and gas can be restored relatively quickly, and gas will somehow be used if propane is available. However, if the water supply is cut off, there is

nothing that can be done about water. As long as there is water and an emergency generator, there is a possibility that hot water can be somehow produced, and the most desired bath can be provided during a disaster. It would also be possible to provide stress care. We believe that water is one of the most important lifelines.

We also remotely monitor the operation of the groundwater membrane filtration system and perform monthly maintenance, so we are confident that the users will have no concerns about water quality or other safety aspects or the hardware.

Propose a "water balance sheet" to achieve water security in times of disaster.

-We have heard that there are some issues regarding Tokyo's groundwater pumping regulations.

Mr. Habuka:

There is a general incorporated association called the Resilience Japan Promotion Council, whose purpose is to promote resilience of the Japanese territory, and I served as its director. There are many working groups under the council made up of representatives from the industry, government, academic, and private sectors. One of them, the Water Resilience WG, submitted a proposal in February 2018 to the then Minister of Land, Infrastructure, Transport and Tourism, Mr. Hachiro Okonogi, to prioritize the realization of "water security in times of disaster" for hospitals, welfare facilities and evacuation centers where water is essential in times of disaster, even if the water supply is cut off. The proposal included development of a "water balance sheet," in which local governments calculate in advance where water will be procured from in preparation for disasters, as well as know-how on how to prepare and cooperate on a regular basis, and the development of facilities such as groundwater membrane filtration systems. That year was a revision year of the National Territory Stewardship Plan, and the revised plan included measures to secure water supply in the event of a water outage. In response, the Ministry of Health, Labor and Welfare (MHLW) established a subsidy program to equip base-hospitals for disaster relief with water storage facilities to enable water supply for at least three days in a disaster. This subsidy program was planned to last for three years, but unfortunately, the introduction of this system did not bring things up to speed as expected.

I also visited the disaster-base hospitals, but many of them

said "we will think about it", as if disaster prevention measures were not a priority, and they did not say "let's do it right away". In the meantime, the COVID-19 struck, and after that, disaster prevention measures were no longer an issue.

While visiting hospitals, we noticed that the Tokyo Metropolitan Government has stricter regulations regarding groundwater pumping than other prefectures, restricting its use. It allows only 10 m³ per day of drawing. This restriction is due to concerns about land subsidence, but surveys show that the amount of water being pumped is on a declining trend due to the decreasing number of large factories and population. Rather, long-term groundwater restrictions have caused groundwater levels to rise, leading to groundwater hazards such as the upward movement of underground structures and land liquefaction. Most counties in the country do not have pumping restrictions.

Of the 84 disaster base hospitals in Tokyo, only 14, or about 16%, utilize groundwater, which is worrisome considering what would happen in the event of an earthquake directly under the Tokyo metropolitan area. I think it is necessary for the Tokyo Metropolitan Government to relax its regulations on water pumping in preparation for water supply disruption due to a large-scale earthquake, etc.



Securing water in the event of a disaster will provide security for local residents and contribute to preventive healthcare.

Dr. Nakajima:

Listening to both of you, I was deeply moved by the fact that we were all working in close proximity and recalled the time when I was sent to New Zealand on a disaster relief mission. One day, the New Zealand military built a shower tent with filtration equipment for the hastily constructed relief team camp. Though we had already been working in the mud for about five days, no one didn't know what it was like to be in it. So, I went into the tent as a sort of human sacrifice and found it was really good. I could feel the mud being washed away and warmth of the water from the shower. Moreover, it made me think, "I'm going to work hard again tomorrow".

There are indeed plastic bottles for drinking water. However, water for maintaining sanitation must be considered separately. There is a concern that the number of sick people, including children, women, and the elderly, will increase if the sanitary environment is not kept clean. Mr. Yasuguchi mentioned a hospital that provided water to the neighborhood residents, which, I think in a broad sense, must have led to preventive medicine. This is a very significant benefit to the local people, and I recognized the importance of having a solid infrastructure.

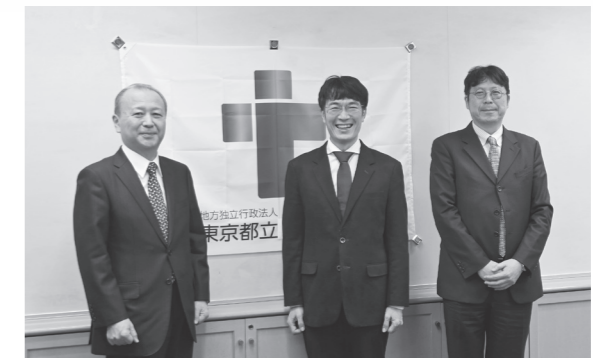
As for the Tokyo Metropolitan Government's (regulations on) utilization of groundwater, my feeling is almost the same as yours. I understand that this is because the disaster based hospitals designated by the Tokyo Metropolitan Government have, at first, raised their hands in a spirit of "let's do our best because the task is tough" and have worked hard to meet the government's requests. Therefore, the approach of saying "Let's do something about it because we are disaster based hospitals" may be a bit harsh. Rather, why not think about involving the local government to protect local residents? If having a facility that can secure water in the event of a disaster provides peace of mind to local residents, I think it will be worthwhile for the municipality to work on this. I think there is also a room for compromise for the suggestion that it would be a good investment that is worthwhile as a plant to protect health.

Mr. Habuka:

Yes, that is one good way to approach it.

Dr. Nakajima:

The "water balance sheet" is a great idea. It would allow doctors at each hospital to agree to share water and reduce



the burden on each other, and it would also allow discussion of areas that need wells in advance.

-What would be the response of, for example, the Tokyo Metropolitan Hiroo Hospital in the event of a water shortage due to an earthquake occurring directly under the Tokyo metropolitan area when they say there aren't enough number of water trucks?

Dr. Nakajima:

I understand that there are certain quotas for securing water, and the protocols regarding requests to the Tokyo Metropolitan Government, etc., but whether water trucks will really be available is another matter. For example, if three parties like us, Japanese Red Cross, and another hospital are all in need of water, I think a problem will arise in reality that eventually one or two of them will not receive the water. Depending on the situation they are in, they will make a request. However, I think that the way they negotiate, the degree of enthusiasm of their presentation, and the urgency of the situation will differ one from another.

On the other hand, I believe that the Tokyo Metropolitan Government that receives the request, will make a decision in the context of macro-operations, such as "If this hospital runs out of water and stops functioning, this area could be devastated". Whether or not the individual hospitals can accept that conclusion, in other words, whether they can accept the fact that it is not their turn will be the issue. I think they will fight over it if they cannot see the relative status of each hospital. Therefore, the central government

should not collect and keep the information within itself, but the information should be made public and visible to everyone. If we do this, I think wisdom will emerge. For example, if it is said at one hospital, "Let's work hard again because the situation will change if we also strictly conserve

water and hold out a few more days", each department of the hospital may say, "Yes, we are still in better situation than other hospitals." It is just only a comparison of inferiority, but I think it will be difficult to get over disaster unless it evokes a sense of trying hard.

Disaster mitigation measures shaped in response to COVID-19 are the 5Ss: Sort, Settle, Sweep, Sanitize, Self-discipline.

-With the end of COVID-19 still unforeseen, there is concern about occurrence of a combined natural disaster. What are your future efforts?

Mr. Yasuguchi:

We are in the business of groundwater treatment and have installed more than 1,000 groundwater membrane filtration systems throughout Japan, and one-third of them are used in hospitals. We've had no major problems, and we believe that our customers are very satisfied with our systems.

I believe that water resources are really important for Japan that has no natural resources and that we should be proud of them. I think it makes a lot of sense to make effective use of groundwater membrane filtration systems in hospital operation and business continuity. We intend to continue expanding this business as a worthwhile system for the society.

Mr. Habuka:

When a new infectious disease and a natural disaster occur at the same time, the situation will be severe. So, it is still very important for hospitals to continue their operations. In addition, sanitation and other aspects of evacuation centers are also important. It will be necessary to separate the infected from non-infected people as well as to secure water. More space will be required than now, and it will be necessary to simulate the separation of evacuation centers from those who have been in close contact with the infected. Dr. Nakajima mentioned that disaster prevention measures should be broken down once for thorough review. Regarding that remark, I also think it will be difficult to transport supplies frequently. I think it is necessary to devise measures that are a little different from those used up to now, such as a change in the way of thinking, so as to send only the minimum necessary items, for example.

Dr. Nakajima:

Now that we are in the middle of COVID-19 pandemic, if any disaster occurs, we will be vulnerable and probably the medical institutions will not be able to do their best anymore. Frankly, we are too exhausted by up to the 8th wave of COVID-19 to make any more efforts. Of course, I

think everyone will work hard at first, but we have to think of ways to make it last. There will be no "one-shot-reversal" measures at the moment.

What we can do now is to review from the basic. It may be a good idea to rethink disaster countermeasures after the cooling period. I think it is necessary to think about where to start from and what needs to be left behind after COVID-19 pandemic is over.

As for the evacuation center, it is clear that we cannot accommodate any more people. We are now only able to accept up to only half the capacity that was previously possible. However, no matter how much we say we can only accommodate 400 people, if 800 people come there, indeed they will be somehow squeezed in. Therefore, I think we have to create a situation where people do not have to come to the evacuation centers. In other words, we need to create a situation where they can take care of themselves at home.

Even though we assume that hospitals will be damaged in disasters, it will be a lot of trouble if they are actually damaged. So, I was thinking about how to mitigate disaster damage in the original sense of prevention without spending a lot of money, and I came down to the idea of organization, orderliness, and cleanliness. If we keep things clean and tidy, things will not fall down, and we will not get hurt by them. If things are clean and tidy, we can start rescue and medical care quickly. Cleanliness is an important factor for hospitals, so if all hospitals maintain the current level of cleanliness after the COVID-19 pandemic, I believe that in-hospital infections will be greatly reduced. In addition, staff wear masks now and they thoroughly wash hands as a measure to prevent COVID-19. All patients who come to a hospital now wear masks. I think this is because there is a great consensus that "There are many weak people gathering here. So, whether you are coughing or not, we all need to be considerate of each other." I think it is the key to how far we can carry along the sense of hygiene that we

have acquired under the recent tough situation. When I was deliberating what we could do in response to COVID-19 for the last three years, I realized that our traditional 5S actions (Seiri, Seiton, Seiso, Seiketu, Shitsuke in Japanese; meanings, in order, Sort, Settle, Sweep, Sanitize, Self-discipline) was the foundation of disaster prevention measures. If we could implement 5S action, it will also serve to mitigate disasters. A clean medical place is a very

good environment for not only patients but also for working staff.

Again, I believe that now is a good time to review the disaster countermeasures that have become like chimeras as a result of complacency, and to think positively about where the main line of the disaster countermeasures should have been.



Distributing "Disaster Risk Reduction Calendar" for learning in a short time.

The Disaster Risk Management Support Center of Tokyo Metropolitan Hiroo Hospital (Director: Dr. Yasushi Nakajima) has created a daily disaster education tool, the Disaster Risk Reduction Calendar HDMG (Hiroo Disaster Management Group), and is distributing the calendar to medical institutions in PDF format. There are the integrated version and the excerpted version for infectious disease response. The integrated version consists of approximately 50 disaster response topics concisely described on the front and back of a single A4-size sheet, while the excerpted version deals with 15 items. Through only 10-minute study session per week in each department of the medical institution, the program aims at encouraging each staff member to improve his or her skills and at enhancing the initial disaster response

capabilities of the hospital as a whole. Director Nakajima, who supervised the program, says, "Staff can study during a break time in their busy schedule with only a few members getting together, and the efforts are spreading, especially in the nursing department".

You can start learning from any item you like.

As for the background of its creation, he noted that "even before COVID-19, the staff of medical institutions had so much to do that they were already tired before they could conduct a large-scale training". On the other hand, he said, "They also knew that they were not prepared to respond to disasters, so I found that there was a need for training", and the tool was created to fill that gap.

Since a certain level of skill is required of participants in order to conduct annual comprehensive disaster drills, "we ask them to learn from their favorite items at their convenient time on the disaster risk reduction calendar", says Director Nakajima. The training at the Tokyo Metropolitan Hospital Organization is designed to be built on the premise of learning with this tool.

For inquiries, please contact the center's secretariat at 03-3444-1181 ext. 2155.

Using the "Disaster Risk Reduction Calendar HDMG" at the end of the morning executive's briefing (photo taken on February 13, 2023, courtesy of Dr. Nakajima).

