

Japan Medical Association Team's (JMAT) First Call to Action in the Great Eastern Japan Earthquake

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Introduction

The Great Eastern Japan Earthquake was a magnitude 9.0 underwater earthquake that occurred at 14:46 JST on Friday, March 11, 2011 when the buildup of energy caused by subduction of the Pacific Plate under the North American Plate was released suddenly. The earthquake caused seismic, or seismic and tsunami damage over an area stretching 500 km from the Tohoku region to the Kanto region as well as an accident at a nuclear power plant accompanied by radiation exposure and contamination problems followed by emergency evacuee countermeasures, financial damage caused by harmful rumors or misinformation, and power shortages across the whole of Eastern Japan. The Great Eastern Japan Earthquake thus thrust upon Japan a predicament that is properly termed a national disaster.

Progression

Beginning of the Great Eastern Japan Earthquake

I experienced the earthquake personally as a lower 6 intensity quake in my house adjoining a hospital in the city of Iwaki, Fukushima (**Fig. 1**). Iwaki has the most moderate climate in the Tohoku region and is also said to be a place with few disasters. The ground rumbled from below and violent tremors like I had never experienced before struck repeatedly over a period of more than three minutes. The doors on a cupboard burst open and dishes and books fell out with a clatter. The pendant lighting in the dining room

swung so wildly as to strike the ceiling. It seemed as if I were watching a slow motion picture. When the shaking had settled down I noticed a fragrant smell coming my way. Looking in that direction I saw that a bottle of Barolo, a representative Italian wine, which had been aged for more than 10 years had smashed on the floor. The mellow red wine had soaked the carpet. Shelving holding some four thousand records fell over, scattering the records and also many CDs, which lay broken on the floor. Even the mobile phone that I had registered for emergencies had difficulty connecting at this time, causing me real distress.

The scale of the disaster stretching from the Tohoku region to the Kanto region and extent of the damaged caused by the earthquake and tsunami along the Pacific coast was enormous. On top of this, as aftershocks kept shaking the area, accidents at the Tokyo Electric Power Company's (TEPCO) Fukushima Daiichi Nuclear Power Plant and Daini Nuclear Power Plant caused secondary damage to the region. At my own medical corporation, more than 50 km away from the Daiichi Nuclear Power Plant, the hospital, nursing home, clinic, and other facilities were all greatly affected, including by broken water and sewer lines and power outage.

JMAT activation

The Japan Medical Association Team (JMAT) concept had been building up since two years before. A subcommittee of the Japan Medical Association's Committee on Emergency and Disaster Medicine had been developing the details to flesh out the concept (**Table 1**). When

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the Great Eastern Japan Earthquake struck, the JMA Disaster Countermeasures Headquarters immediately held an emergency discussion about activating the JMAT concept. The Board of



Fig. 1 Tsunami damage in Toyoma, Iwaki City, Fukushima

This picture was taken on March 30 near the coast about a ten-minute drive from the author's house. The tsunami had knocked utility poles down and left mountains of wreckage behind.

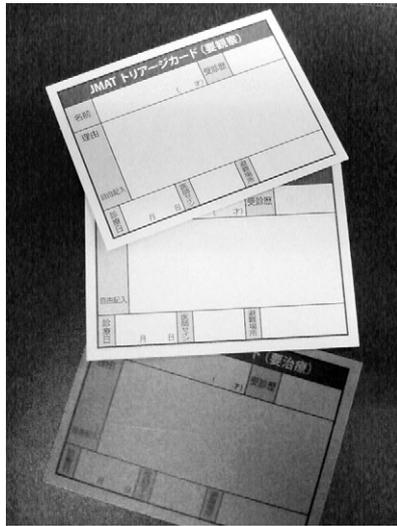
Trustees' consent was obtained and a request for the dispatch of teams was sent out to prefectural medical associations nationwide. On March 15, this decision was made known to the public at an emergency press conference.

At the time of JMAT activation, we also prepared simple three-level triage cards¹ (**Fig. 2**) that can be issued to evacuees when JMATs are in action at local evacuation shelters. We also prepared checklist sheets² (**Table 2**) for each evacuation shelter to enable the easy sharing of information when presiding at the joint conferences held locally every morning and evening, mainly at the local municipal medical associations.

By calling on prefectural medical associations nationwide we got a big response, including already dispatched teams, in a very short time. Going on the basic assumption of providing support for about 400,000 evacuees in the afflicted area stretching 500km across Iwate, Miyagi, Fukushima, and Ibaraki, we initially estimated sending out teams consisting of one doctor, two nurses, and one coordination staff for a period of three days to one week with about 100 teams

Table 1 Overview of Japan Medical Association Team (JMAT)

<p>1. Purpose</p> <ul style="list-style-type: none"> • To provide healthcare at evacuation sites and first-aid centers • To provide medical assistance at hospitals and clinics in the disaster-affected areas (and to provide the ongoing healthcare that needed to be continued even before the disaster occurred) <p>2. Supporting site, supporting medical association (general rule)</p> <p>Iwate: Hokkaido, Tohoku (Akita), Tokyo, Kanto-Koshinetsu and Kinki blocks (Osaka, Wakayama) Miyagi: Tokyo, Kanto-Koshinetsu, Kinki (Hyogo, Nara), and Chugoku/Shikoku blocks Fukushima: Tokyo, Chubu, Kinki (Kyoto, Shiga) blocks Ibaraki: Kyushu block</p> <p>3. Team composition (example)</p> <p>1 Physician, 2 nurses, 1 coordination staff (driver)</p> <p>4. Necessary medical supplies and equipment</p> <p>Corresponding to the above tasks, including food and others</p> <p>5. Dispatching duration of the team</p> <p>Approximately three to seven days (depending on discussion with supported sites and supporting associations)</p> <p>6. Communication method with JMA: Mobile phone</p> <p>7. Payment of expenses</p> <p>JMA and the prefectural medical associations shall bear the costs and expenses.</p> <ul style="list-style-type: none"> • The Disaster Relief Act will be invoked. • One million yen from JMA (immediate) <p>8. Compensation for secondary disasters: Handled by JMA</p>
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(From top) White card: needs observation, Yellow card: needs attention, Red card: needs treatment

Fig. 2 JMAT Evacuation Center Triage Cards

Triage cards were prepared by the Japan Medical Association for JMAT activities in the Great Eastern Japan Earthquake. Different from triage tags used during the acute phase of a disaster, physicians write their on-the-spot judgments down on these cards and give to patients in evacuation shelters and other locations so that they can be connected later treatment and used by takeover caregivers.

in action simultaneously for one month. As it happened, there was a second movement of survivors out of the pertinent region and others returned home to begin reconstruction after the fear of earthquakes and tsunamis had subsided. This resulted in the number of evacuees gradually declining to the 200,000 level. Plus, with the entry onto the scene of teams other than JMATs, adjustments were made with local needs and the number of JMATs in action at the same time reached 60 or so (Fig. 3). At that point the affected areas indicated that there were a sufficient number of teams on the ground.

Regarding aid supplies, the Japan Pharmaceutical Manufacturers Association provided approximately 8.5-ton truckloads of drugs free of charge. These were delivered to the Iwate and Miyagi medical associations by US military aircraft from Yokota Air Base.³ At the same time, approximately 1.6-ton truckloads of drugs and other medical supplies arranged as paid-for disaster assistance based on a list of needed supplies were sent from the Aichi Prefectural Medical Association to the Fukushima Prefectural Medical Association in a private jet belonging to Mitsubishi Heavy Industries. The Japan Self-Defense

Table 2 Items included in the JMAT Evacuation Center Checklist

Prepared by: _____ of the _____ Medical Association
Date prepared:
Shelter name:
Shelter address:
Capacity:
Gender ratio:
Vulnerable people (elderly, children, pregnant women, dialysis patients, determination of treatment necessity):
Medical needs (including sufficiency of drugs):
Possibility of radiation exposure:
Water/food:
Toilet/hygiene:
Persons needing nursing care:
No. of JMAT Evacuation Center Triage Cards: Red , Yellow , White
Other:

These checklists were prepared by the Japan Medical Association following the Great Eastern Japan Earthquake to be used by JMATs for making simple activity records and for handing over duties to successor teams.

Forces then conveyed all the supplies to local medical associations.

When putting the JMAT concept into operation, right from the beginning there were offers of participation from various organizations including the Japan Pharmaceutical Association, the All Japan Hospital Association, the Association of Japanese Healthcare Corporations, and the Japanese Association of Psychiatric Hospitals.

In response, all approved JMATs—some 5,000 people—were covered by accident insurance and asked to go into action under the coordination of the JMA.

Medical treatment for radiation exposure

Following the occurrence of the Great Eastern Japan Earthquake on March 11, 2011, six reactors at TEPCO's Fukushima Daiichi Nuclear Power

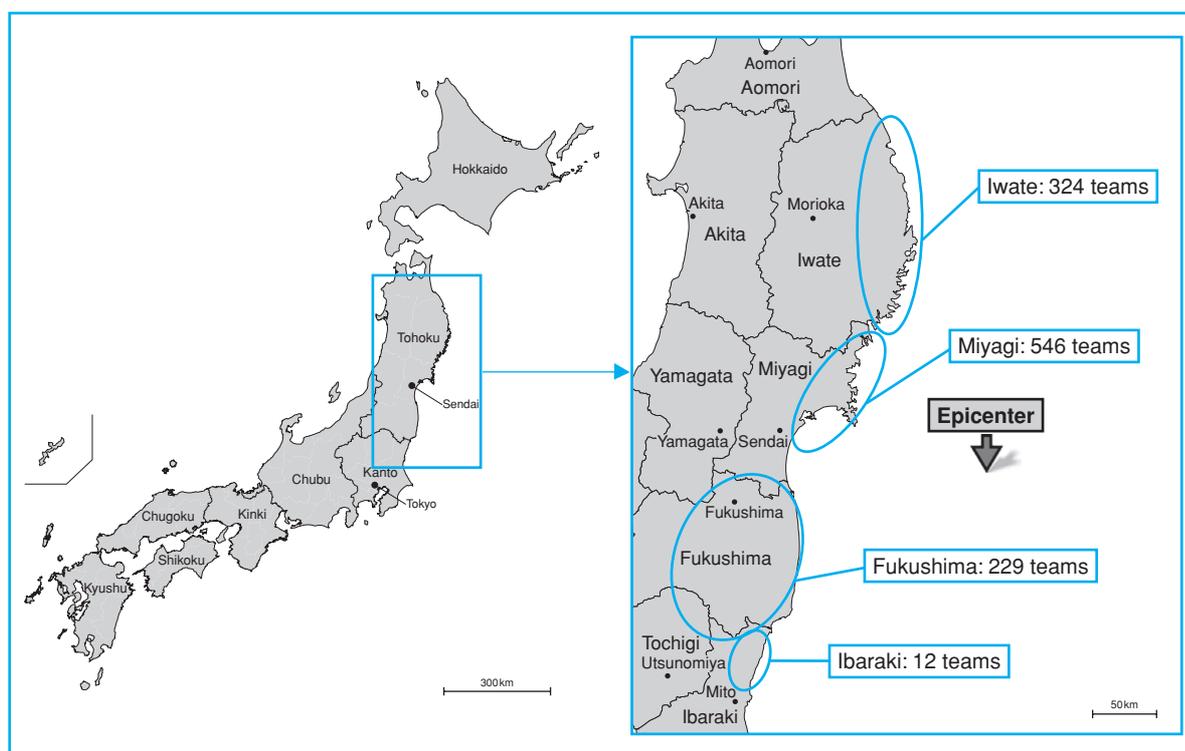


Fig. 3 Map of JMAT dispatch locations

The map gives a general view of the areas to which JMATs were dispatched in the Great Eastern Japan Earthquake and the number of teams sent to each area. As of May 24, 2011, 1,114 JMATs have been dispatched including three teams that were dispatched to several prefectures (not shown in the map), and 71 JMATs are on standby.



Fukushima Daiichi Nuclear Power Plant



Fukushima Daini Nuclear Power Plant

Fig. 4 Fukushima Daiichi and Fukushima Daini Nuclear Power Plants

(Source: TEPCO. <http://www.tepco.co.jp/index-j.html>.⁵)

Plant and four reactors at its Daini Nuclear Power Plant went into emergency shutdown (Fig. 4).⁴ However, a succession of hydrogen explosions occurred in due course over a few days at reactors 1–4 at the Daiichi Plant, including reactor 3, which ran on mixed uranium and plutonium oxide, or MOX fuel, in conjunction with the disruption of backup power. The government issued an evacuation order within a 20 km

radius of the Daiichi Plant, instructed people in the zone 20–30 km from the plant to stay indoors, and ordered an evacuation within a 10 km radius of the Daini Plant, which is some 10 km to the south of the Daiichi Plant. Iwaki is distant from both power plants. In terms of my own medical corporation, the closest hospital to the Daiichi Station is 50 km away and the other facilities are 60 or more kilometers away. However, with the

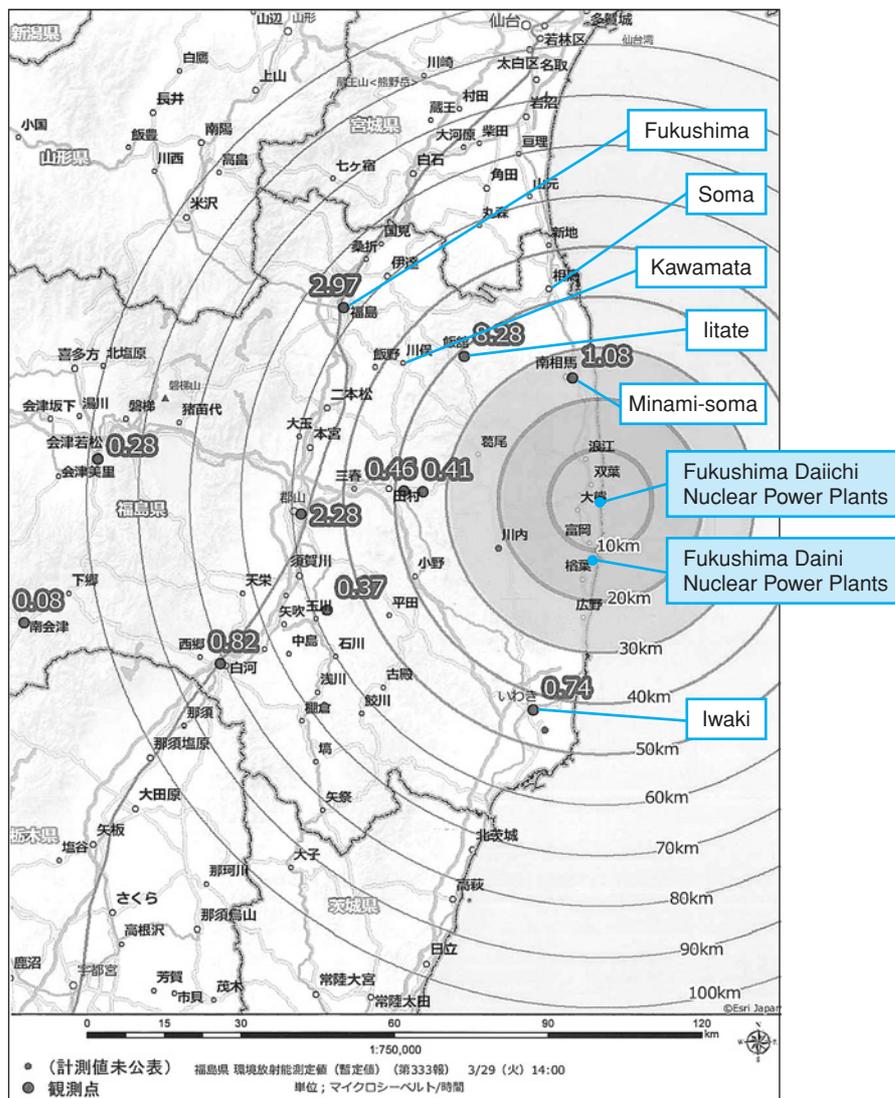


Fig. 5 Onion diagrams of radioactivity readings in Fukushima prefecture

These diagrams were prepared with the help of Yoshinari Kimura, a lecturer in the Graduate School of Literature and Human Sciences at Osaka City University, based on preliminary environmental radioactivity readings in Fukushima prefecture. The diagram included here is based on readings taken at 14:00 on March 29. A reading of 2.23 was recorded in Iwaki on March 22 and a high reading of 13.1 was recorded in Iitate on March 23, but these gradually declined afterward. On April 26, when publication of these maps was concluded, the reading in Iwaki was 0.27 and that in Iitate was 4.07.

US independently advising evacuation within the 80km zone and then when the Japanese government added a temporary 30km evacuation, a small part of northern Iwaki fell within the evacuation zone. Thereafter, Iwaki, the city of Soma, other communities and eventually the whole of Fukushima got caught up in extremely harmful rumors and misinformation. One month later, the government changed its rating of the accident on the International Nuclear and Radiological Event Scale (INES) from an initial 5 to 7, which is the most serious accident level. And thus the rumors showed no sign of settling down.

Aiming to compensate for this kind of information gap, the JMA obtained the cooperation of Yoshinari Kimura, a lecturer in the Graduate School of Literature and Human Sciences at Osaka City University, and quickly published on its website a map of air contamination levels across Fukushima showing changes over time (**Fig. 5**). The JMA also requested Nagasaki University to dispatch experts in medical treatment for radiation exposure, which led to the prompt appointment of Professors Shunichi Yamashita and Noboru Takamura as advisors to Fukushima prefecture's disaster countermeasures headquarters. Later, town meetings were held with evacuees and residents in contaminated areas in the prefecture and medically reliable information was gotten out. Looking at the numbers, it became known that the contamination level was low even within Fukushima prefecture, such as in places like Iwaki and Soma, which are located to the north and south of the nuclear power plant. The necessary disaster relief activities were fixed in place through the continuous dispatch of JMATS to the area with JMATS from the Aichi Prefectural Medical Association going to Iwaki and JMATS from Nagasaki University and the Nagasaki Prefectural Medical Association going to Minami-soma, which is inside the 20–30 km zone.

Aftershocks and aftermath

It was reported after the earthquake that the entire Japanese archipelago had moved a few meters to the east and that the coastline in some of the affected areas had sunk by around one meter depending on the location. Although unavoidable in light of the scale of this enormous change, the upper 6 aftershock (on the seven-

point Japanese intensity scale) with an epicenter in Miyagi that struck on April 7 caused widespread blackouts across the Tohoku region. Then, an inland earthquake that struck Fukushima on April 11 caused big tremors of lower 6 intensity in Iwaki. Once again this caused a disruption in lifelines including water, sewer, and power services. Aftershocks continued thereafter and even now it is hard to say that things have calmed down completely.

Regarding the nuclear accident in Fukushima, a lull seems to have been obtained for the time being by such measures as the continuous injection of water from outside into reactors 1–4 at TEPCO's Daiichi Nuclear Power Plant. But, a cold shutdown has not yet been achieved. Meanwhile, it has become difficult to keep the region going, since evacuation orders due to high levels of contamination in the village of Iitate and the town of Kawamata outside the 20km exclusion zone were issued in addition to those for communities within the 20km exclusion zone around Daiichi Plant. Not only Fukushima's agricultural and fisheries products but even its industrial products are still exposed to harmful rumors of radioactive contamination on top of damage suffered from the earthquake.

Second stage

At one month out from the disaster, the JMAT support system can be considered to have entered its second stage. Ibaraki requested the discontinuation of JMAT dispatches from afar, indicating that it would focus on disaster support activities with teams formed within the prefecture from there on. Meanwhile, the other three afflicted prefectures requested support limited to areas that were severely damaged. Nevertheless, the damage in these remaining regions is truly enormous, and so even if support continues while shifting to a locally based system, the possibility remains that the necessary support will be prolonged considerably.

What is more, in view of the rainy season and summer heat that will come in the months ahead, even greater attention will have to be paid to sanitation and nutrition as well as measures against infection and heatstroke for people who remain in evacuation shelters. The far-reaching answers to these issues include many aspects that will need to wait for political and administrative measures, including temporary housing and reem-

ployment support measures as well as planning that could take more than a year, such as restoration of community healthcare based on new town development. In that respect, consideration will have to be given to health support for evacuees in medical, nursing, and health and welfare measures, and statements will have to continue to be made to the relevant organizations. Additionally, intricate support for evacuees who have scattered from the affected areas across the entire nation is needed in various aspects, including medical and nursing care insurance.

Although slow to start, it became possible to obtain valid information as shown above in the medical sector, and so JMAT activities were enhanced in Fukushima, which had the problem of medical treatment for radiation exposure. In Iwaki, medical institutions got back into business at about the 90% level compared to before the earthquake, except for a few hospitals and clinics that had been damaged considerably by the earthquake and tsunami. With this, it was decided to stop the dispatch of JMATS to the city in early May.

In this way, efforts are starting, although gradually, to move toward recovery in communities where contamination from the nuclear accident was minor and in other areas affected by the earthquake.

As of May 24, 71,114 JMATS have been in action on the ground and 71 teams are currently on standby.

Discussion

After the JMA's Committee on Emergency and Disaster Medicine came up with a definite plan, the JMATS concept was announced via email newsletter on March 11, 2010, exactly one year before the Great Eastern Japan Earthquake.⁵ Behind this concept was the fact that prefectural medical associations had been positioned as specified local public entities by the Basic Act on Disaster Control Measures and the Civil Protection Act.^{*2} In other words, once a disaster of a certain scale occurs, a prefectural government will set up a disaster countermeasures headquarters and the prefectural medical association will be incorporated into the countermeasures head-

quarters with, as a general rule, the president of the prefectural medical association being positioned as a deputy head of the countermeasures headquarters. For this reason, disaster agreements were signed between prefectural governments and prefectural medical associations with the enactment of these laws. The agreement with Fukushima Prefecture was signed when I was the responsible vice-president of the Fukushima Medical Association.⁶ Human life and health were made the top priority by including in the agreement a "deemed clause" that if emergency medical teams are sent out at the discretion of the medical association during a disaster, such action will be deemed as a requested mobilization even if notice is given after the fact. Further, the agreement guarantees that team members will be compensated as public servants during their mobilization and that reimbursement will be provided for actual expenses to perform the work. Ever since I was appointed as an executive board member of the JMA and became responsible for emergency and disaster medicine five years ago, I have recommended the inclusion of these two items in such agreements.

In 2006, the World Medical Association's (WMA) Asian-Pacific Regional Conference was held in Tokyo. Disaster preparedness and response to infectious disease and to earthquakes & tsunamis were chosen as the two main themes, and lively discussions were held with participation from members that make up the Confederation of Medical Associations of Asia and Oceania (CMAAO) and Japan's prefectural medical associations. A record of the conference was published in a special edition of the JMA's English language journal, the Japan Medical Association Journal (JMAJ).⁷

With the above as backdrop, members representing regional blocks of prefectural medical associations and Japan's leading emergency aid specialists were nominated as members of the JMA's Committee on Emergency and Disaster Medicine, which I was presiding over, in order to broaden the scope of the committee's discussions. Moreover, we obtained the participation of advisors from the Ministry of Health, Labour and Welfare (MHLW), the Fire and Disaster Management Agency, and the Japan Coast Guard as

*2 The full title is the Act concerning the Measures for Protection of the People in Armed Attack Situations, etc. (Buryoku Kogeki Jitai tou ni okeru Kokumin no Hogo no tame no Sochi ni kansuru Horitsu).

well as the National Institute of Radiological Sciences and the Self-Defense Forces Central Hospital. Based on the lessons learned from the Great Hanshin Earthquake,⁸ an inland earthquake that occurred in 1995, the MHLW created Disaster Medical Assistance Teams (DMATs) as first-response medical teams. The JMAT concept became clearer out of the results of ex-post verification of DMAT experiences in incidents that occurred thereafter, including the Noto Peninsula Earthquake of March 25, 2007 and the Chuetsu Offshore Earthquake of July 16, 2007. Basically, the purpose of JMATs would be to take over the roles of DMATs, which start to withdraw 48 hours after the occurrence of a disaster, and to provide support until afflicted hospitals and clinics reestablish their function as the bearers of community health. On that basis, the JMAT concept was proposed as the JMA's disaster medical response in a report presented to the media on March 11, 2010.

This year is the 50th anniversary since Japan adopted a universal health insurance system, which acts as a safety net at ordinary times. During various kinds of disasters, the most reliable entities in the fields of medical and nursing care and health and welfare for evacuees who are compelled to live inconvenient lives in evacuation shelters and other temporary conditions are the health care resources centered on primary care doctors, who are responsible for community health with the universal health insurance system as the foundation. In other words, the members of municipal medical associations that form community health networks including hospitals and clinics are those persons who are relied upon the most. Thus, it is a serious problem when those persons are afflicted by a disaster along with other community residents. Accordingly, there is a need to establish a system for providing first-aid mainly at evacuation shelters with support from nearby areas, and from distant regions if a disaster is large, until the community health network is restored. This support must be tailored to the circumstances of the affected area and start from the withdrawal of DMATs, which are responsible for medical conveyance work in the hyperacute phase as mentioned above, with the disaster countermeasures headquarters set up at the prefectural government level acting as the nerve center.

From a different perspective, although partici-

pation itself as a team in this JMAT concept is based on free will depending on professional autonomy, it is still a matter of fact that JMAT activities are deemed what you might call the provision of first-aid as a quasi-civil servant activity within the notion of the Disaster Relief Act. For that reason, the full amount of actual expenses will be defrayed at national expense after matters are arranged in the prefectural disaster countermeasures headquarters. In that case, prefectural medical associations, which are designated as specified local public entities, are responsible for the work of compiling the documents that will serve as the basis to bill for the actual expenses of JMAT activities. And the JMA fulfills a role as a bridge and coordinator between the afflicted areas and the prefectural medical associations that provide aid. The above is the bare bones of the JMAT concept.

The earthquake and tsunami in the recent disaster inflicted tremendous damage to coastal areas, severed overland routes, and damaged many medical institutions. Information tended to get disrupted, making it difficult to grasp the full picture. In response to a situation in which many survivors in need of help had been swept away by the drawback and were scattered on the ocean, it seems that there was a need for a first-response rescue from the air and sea after grasping the situation from the air during the hyperacute phase. There may be a need for a higher level of response capabilities including the establishment of air ambulances and disaster prevention helicopters for rescues from the air as well as high-speed craft and hospital ships for rescues from the sea, for activities that are organically connected with DMATs, and also for consideration in the future of lifesaving activities that are coordinated with the Japan Self-Defense Forces, the Japan Coast Guard and, depending on the situation, with the resources of the US military.

Saying something in relation to medical treatment for radiation exposure, during the Tokai Village JCO Criticality Accident that occurred in 1999, as a core city in a neighboring prefecture, Iwaki was asked to provide a radioactive contamination measurement service for residents. When this service was implemented by the Iwaki Health Center, a total of 880 people received the measurement. In the breakdown, 10% of those people came from adjacent northern Ibaraki areas. This fact is strongly engraved in my

memory as evidence that, when debating medical treatment for radiation exposure, citizens dragged into a radiation incident want safety and peace of mind measures with sufficient breadth to straddle area borders. Just like the recent disaster, the Chuetsu Offshore Earthquake that struck Niigata prefecture affected an area with a TEPCO nuclear power plant that sends electricity to the Tokyo metropolitan area. It was reported that the information sent out by local medical association members who were affected together with the rest of the community indicating that the facilities connected to the nuclear power plant were alright contributed greatly to local residents' sense of reassurance.

When looking at the accidents at TEPCO's Fukushima Daiichi and Daini nuclear power plants from this perspective it seems undeniable that both the quantity and speed of information disclosure was too little, too late throughout the course of the incident, from the initial emergency shutdown and loss of backup power through the hydrogen explosions and air contamination to the contamination of seawater. This is not only because there had repeatedly been news on numerous occasions of trouble and cover-ups in the past, but also because iodine tablets had already been distributed in advance to residents living within 20km of the nuclear power plants and because government administrations, residents, medical personnel, and others in areas with nuclear power plants had been engaging

in annual mass evacuation drills that assume a nuclear disaster. I myself had engaged in these practices, including learning opportunities and drills for airport disaster prevention and medical treatment for radiation exposure through activities in which I was in charge of emergency and disaster medicine in the Iwaki Medical Association and the Fukushima Medical Association. And, even in Iwaki, which is outside the 20 km zone around the nuclear power plant, a stockpile of iodine tablets for 300,000 people had already been secured in health centers in conformity with the request of the medical association. Thus, local residents had also chosen the position of a place where a nuclear power plant is located for sending power to Tokyo after a considerably high level of debate through numerous processes up to now as mentioned above. That is all the more reason why there is still doubt over whether there was a need for people to all suddenly be herded into life in evacuation shelters for who knows how long like abductees who could not even lock their houses let alone get their iodine tablets and cash to carry, and all without being given any detailed information at all. Also, regarding air and soil contamination, unfortunately it does not seem that procedures were taken to gain the understanding of residents through the robust disclosure of information from the government, including forecasts and contamination levels based on the Ministry of Education, Culture, Sports, Science and Technology's System for

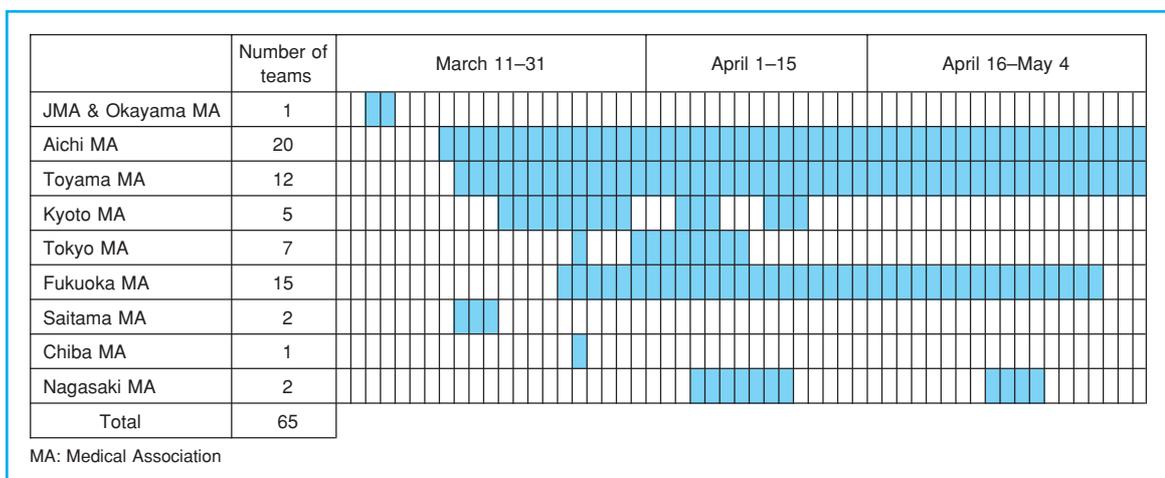


Fig. 6 Calendar of JMATA dispatches to Iwaki

The period of dispatch is from the time a team leaves home until it returns. So, this may differ from the time actually spent in action in the afflicted areas. There are also instances of multiple teams being dispatched on the same day.

Prediction of Environmental Emergency Dose Information (SPEEDI), in the same manner as the drills that had been conducted thus far. This had an adverse effect in the closing of medical institutions within 20 km of the nuclear power plant, during the breakdown of communities and community health system caused by the order to take long-lasting refuge indoors in the 20–30 km zone, and on healthcare support for the earthquake and tsunami given in Iwaki, Soma, and other locations outside the 30 km zone. This is why the JMA independently requested the provision of mapping data on the degree of contamination centering on the Fukushima Daiichi Plant and the provision of information by a Nagasaki University team of experts in the medical treatment of radiation exposure. At the same time as this work, medical assistance efforts, including JMAT, aimed at recovery in Fukushima's coastal areas finally got underway and eventually came to be strongly formed (Fig. 6). When looking at this progression, I have to say that many aspects seem to be man-made disasters, including the damage caused by harmful rumors or misinformation in sectors outside of healthcare.

From here on it will be important for us to deepen conceptualization of a system suited to Japan in a large-scale disaster while engaging in discussion in the WMA. I think that we need to develop a training system for JMATs while taking the training system provided by the American Medical Association and others as a reference, share basic knowledge about issues such as medi-

cal treatment for radiation exposure and chemical and infectious disease terrorism, and firmly establish related systems. We have to protect the community health system, in many aspects, that is sustained by the universal health insurance system, which is now in its 50th anniversary. To do so, we must raise the level of disaster response capabilities in the medical field, which have leveled off. At the same time, we must increase capabilities to respond to special disasters, including chemical, biological, radiological, and nuclear (CBRN) terrorism countermeasures that assume diverse events, not only the ability to respond to an accident at a nuclear power plant like the situation this time. During the Great Eastern Japan Earthquake, truly comprehensive responses were required in the medical fieldwork and I think the achievement shown this time gives empirical backing to the significance of the JMA's habitual lifelong learning activities.

Looking at the progression of this incident, the JMAT concept worked as medical assistance provided from across the nation in response to a major disaster that greatly exceeded predictions. The marshaling of the great strength of Japan's medical professionals and the results they can achieve were demonstrated through JMAT activities to support the 400,000 afflicted persons requiring health support and to help communities and community health move toward recovery. Among the physicians who participated in JMATs, a little less than 60% were members of the JMA, which is nearly the same composition

Table 3 Number of persons registered in JMAT by occupation

(As of May 24, 2011)

Occupation	Total
Physician (JMA members account for almost 60%)	1,970
Nurse, Assistant nurse	1,684
Pharmacist	424
Coordination staff	1,017
Other	474
Total	5,569

The number of JMATs: 1,185 teams (1,114 JMATs are in action including those whose dispatch has been settled, and 71 teams are on standby.)

Including teams preparing to be dispatched. The Other category includes physical therapists, occupational therapists, clinical laboratory technicians, clinical radiologists, social workers, psychiatric social workers, clinical psychologists, care managers, and nutritionists, etc.

as the JMA's membership ratio. I believe that this shows how physicians from across the country came together (**Table 3**).

When I visited Iceland two years ago I saw with my own eyes a great rift or surface crack called a *gjá* in Icelandic. It was an opportunity to directly recognize plate tectonics, where the Mid-Atlantic Ridge separates two plates that are moving away from each other. The energy caused by these two plates colliding in the Pacific Ocean at Japan is what created the seismic center of the Great Eastern Japan Earthquake that struck near the Japan Trench. Having actually experienced this massive earthquake, I cannot silence the feeling of being overwhelmed once again by the enormous strength revealed by nature. What can we medical practitioners do in the face of such colossal power shown by nature's destructive force? I believe that what we can do is to muster and build up our individual efforts as professionals, thereby making the greatest possible contribution to afflicted areas as we can. The Japan Self-Defense Forces, the US military and various other organizations as well as assistance from individuals helped in the emergency conveyance of drugs and other supplies.³ I think that this will be remembered as representing the deep understanding of and cooperation with medical association's humanitarianism-based activities. Additionally, it was brought home to me that the collection and disclosure of information by the JMA and the dissemination of a better understanding of medical treatment for radiation exposure are needed to maintain medical activities in a crisis situation resulting from a nuclear accident. On this point as well, each one of the compassionate acts of numerous people left a mark on my heart.

Moreover, as this was the first time the JMAT

concept was put into effect, I think that it will be important for us to deepen conceptualization of the system suited to Japan in a large-scale disaster, develop a training system for basic knowledge about medical care for radiation exposure and special disasters such as chemical and infectious disease terrorism in addition to ordinary disasters, and to firmly establish the system of JMAT activities after a rigorous ex-post verification of overall JMAT activities based on the experience gained this time.

Conclusion

Seeing that over a thousand JMATs have been on the ground and that over 70 teams are still on standby, the JMAT concept has demonstrated the truly immense power of medical personnel and medical associations in the field of disaster medicine at this time when they were compelled to respond to a huge disaster of unprecedented scale.

I believe that we need to carry on with the creation of a system that calls on members of medical associations nationwide and other medical personnel during normal times.

Dedication

I offer heartfelt condolences for the many people who lost their lives in the Great Eastern Japan Earthquake and related disasters.

Acknowledgments

I would like to offer my profound gratitude to Dr. Takashi Nagata of Himeno Hospital for his cooperation in formulating the JMAT concept and putting it into practice. I also offer my deepest appreciation for the numerous kindnesses of so many people received at the time of this unprecedented earthquake.

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