

Disaster Management at Soma General Hospital in Response to the Great East Japan Earthquake

JMAJ 57(5-6): 331-334, 2014

Hisanori FUKUNAGA,¹ Hiromi KUMAKAWA²

The great earthquake of March 11, 2011, the first of its magnitude to hit Japan in a thousand years, and the consequent tsunami led to unprecedented damage to various areas of the Pacific coast in northeast Japan. Added to these double disasters, residents in Fukushima Prefecture are tormented by the fear of nuclear meltdown at the Fukushima Daiichi nuclear power plant even now. Soma City, with a population of approximately 38,000 people, and Shinchi town, with approximately 8,000 residents, were both severely damaged by the triple disaster. Nevertheless, Soma General Hospital, which is in the service of these communities, and located only 40 km north of the nuclear power plant in question, has been able to fulfill its role as a key regional hospital, delivering medical services effectively with minimal confusion. We would like to review measures that could help deal with similar catastrophes in the future by looking back on this hospital's performance during the catastrophe.

The first thing we did was construct a system for triage so that we would be fully prepared to respond to emergency patients from the initial phase. Because of the temporary closure of the emergency room in the former hospital ward, the emergency room was relocated to the new hospital ward, which had sufficient structural strength to withstand the earthquake; waiting rooms, examination rooms, reception, medical consultation rooms, prescription issuance rooms, etc. were set up around the emergency room. Functions were integrated to achieve the aim of having a minimal flow of people coming in from outside through the temporary entrance, and

there was also an efficient deployment of doctors, nurses, clerks, etc. We also arranged beds in the corridor in front of the waiting rooms so follow-up consultations could be carried out without hospitalization (Fig. 1). Once a disaster victim who had been forced to evacuate is hospitalized, it would often take a long time to safely discharge the victim. This desperate measure was therefore taken to avoid the hospital becoming full. As for emergencies, young doctors initially worked in pairs by dividing the day into three shifts, but we devised a role-sharing system that combined all of our forces irrespective of department or age.

On the second day after the disaster, we clarified the division of roles between medical association volunteer doctors, hospitals, and medical practitioners. Hospitals undertook the cases of emergency and hospitalization, and practitioners from private institutions were asked to visit evacuation shelters in various parts of Soma City. This division of roles was logical because the private medical practitioners' clinics were mostly closed due to shortages of nursing and office staff and/or damages from the earthquake. For this reason, we were able to maintain existing hospitalization functions and take on other functions, such as dealing with emergency outpatients and patients with prescription requests from other hospitals. Ambulances handled numerous patients with hypothermia and trauma patients from the initial tsunami damage, but patients with colds, pneumonia, cerebral infarctions, and so on increased after the third day. There were also many patients with acute gastric ulcers.

¹ Soma General Hospital, Fukushima, Japan (fukunaga-ykh@umin.ac.jp).

² Soma General Hospital, Fukushima, Japan.



Fig. 1 A hospital ward that provided outpatient care after the disaster



Fig. 2 A scene from the daily morning meeting (March 2011)

Every morning, a meeting was held to share information among the doctors, nurses, and pharmaceutical, examination, and radiology technicians, as well as managers, office staff, and representatives from nutrition departments (**Fig. 2**). We were able to grasp the situation and understand transitions in vital information that changed day by day and hour by hour regarding stocks for test drugs, X-ray films, medicinal and food supplies, radiation levels, and so on. By requesting the presence of prefectural health division representatives, we were able to coordinate with hospitals, dispensing pharmacies, and medical associations to deal with mentally ill patients at the hospital and to restrict the dispensation of psychiatric drugs to a single specialist location in the city, even while telephone communication had not been reestablished and cars could not be used because of a lack of gasoline. In this way, we were able to fulfill our role as a key hospital in the Soma region without making any compromises under the system of cooperation with people in various lines of work inside and outside the hospital.

Every doctor worked tirelessly and without taking leave. Many doctors stayed continuously in the hospital, and their high sense of professionalism and their strength of unity were shown very clearly. Our success was also achieved by the strong relationship built between the hospital and medical associations over several decades. In addition, we must not forget that the hospital workers were supported with three meals a day, which the nutrition department staff provided.

Despite meager food supplies they did their best to sustain the activities of doctors, nurses, and other staff. As the famous saying goes, “an army marches on its stomach”—and, not even once did we feel hungry.

From March 11 to 31, 2011, 110 patients were taken to the Soma General Hospital by ambulance, and 87 were immediately admitted to intensive care. In total, 8,068 outpatients were treated. As shown in **Fig. 3**, during this period the number of outpatients by department were: internal medicine 4,257 (53%), urology 889 (11%), surgery 626 (8%), orthopedics 602 (7%), pediatrics 594 (7%), otorhinolaryngology 480 (6%), ophthalmology 213 (3%), dermatology 140 (2%), neurosurgery 114 (1%), obstetrics and gynecology 82 (1%), and cardiac surgery 71 (1%).

The difficulties the hospital faced at that time were comparable to those faced by other areas affected by the earthquake and tsunami. These difficulties included: (1) shortages of hospital stockpiles (pharmaceuticals, food, water, medical oxygen, and other medical consumables); (2) limitations in mobility due to gasoline shortages and limited telecommunication means; (3) increasing unavailability in prescription drugs such as psychiatric agents at the hospital due to the closure of clinics and influx of evacuees, exacerbated by the need for manual administration of hospital paperwork (i.e., computers were nonoperational) (note: our situation was further complicated by the fact that the hospital had no psychiatric ward); (4) difficulty interacting with the pharmacies in the city; (5) increase in the

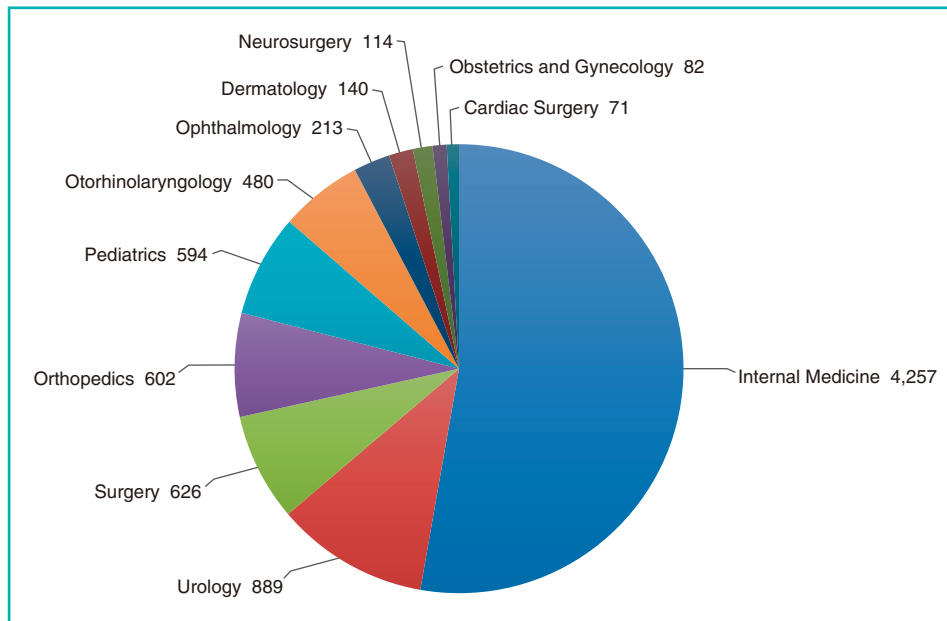


Fig. 3 Numbers of outpatients by department from March 11 to 31, 2011

number of people who needed medical treatment due to increasing number of evacuees and shelters; and (6) increase in emergency healthcare requests from other regions.

Members of the medical community observed the following regarding the delivery of healthcare services after the earthquake: (1) *okusuri-techo* (personal record books of prescription history, widely available in Japan) that many evacuee patients brought with them were extremely useful; (2) because cooperation with the medical associations was efficient, the hospital efforts could be devoted to emergency needs and inpatient services, and practitioners' roles in visiting the shelters were determined quickly and clearly; (3) people who helped hospitals, medical practitioners, the city hall, public health centers, and pharmacies by assisting the communication between the involved parties and coordinating our activities, were essential; (4) local residents provided excellent cooperation to recover food provisions and restore hospital equipment; and (5) hospital staff remained united in their dedicated efforts throughout the aftermath of the disaster.

This hospital was fortunate; there were no power outages, the loss of water supplies was

temporary, there was an entire tank of oil for heating, and the damage to the wards was minor. Moreover, as the hospital did not fall within the evacuation area of the nuclear accident, we did not have to move the inpatients. Nevertheless, the hospital management is thankful for the commendable spirits of our hospital staff who, amid the considerable fear and anxiety associated with the nuclear accident, remained united all the way in their dedication to meeting the community's healthcare needs. We believe their dedication was a major factor in the hospital's success in responding to the earthquake. If staff members unite and work as one, they form a great force and can overcome any difficulty. The fact that everyone was essentially able to experience this sense of unity was the greatest lesson we learned from the healthcare practice from this earthquake.

From the above experience, we would like to suggest additional countermeasures to be considered in future disaster preparations as follows.

- (1) Advance establishment of a medical coordinator for disaster relief, and the identification of a number of supporting staff who would assist the coordinator's work in a disaster situation.

- (2) Means of verifying patients' medical information including, but not limited to, *okusuri-techo* (personal prescription history notebooks), for any emergency care such as contraindicated drugs or allergy history, at the least.
- (3) Regular review of disaster stockpiles, such as pharmaceuticals, food, and water (both at the hospital and in nearby locations).
- (4) Solid guarantee of efficient communication and transportation.
- (5) Building good relationships with the local medical association and residents in normal times.

There are many issues that have not been covered in this brief summary, such as how to build a primary emergency system in the future that covers broad and urgently affected areas

where telecommunications and transportation are hindered after a large-scale disaster. This large earthquake is said to have been the worst in a thousand years; hence, a similar serious disaster may not hit this area for a while. However, no one knows what type of disaster could occur in the future. Keeping in mind the Japanese proverb, "no need to worry if you are prepared," we would like to devise countermeasures for the future.

Acknowledgments

We express our sincere gratitude to everyone who extended their support to the people in Fukushima at that time. We are grateful to Dr. Ohtsura Niwa for helpful discussions and to Ms. Ikuko Inoue for providing us with some data.