Robust support for damaged regional medical systems

Lifelines in the affected areas were stopped immediately after the Great East Japan Earthquake. The local core hospitals, their food and medical supplies for the patients and staff nearly exhausted, were faced with a crisis in their medical systems. The Tohoku University Hospital perceived these conditions in the local core hospitals, and prepared a system to accept all critical-condtion patients from them. The University Hospital arranged buses to these hospitals and periodically sent replacement medical staff. Moreover, it worked with medical staff all over the country to provide support goods, such as food and medical supplies, which were brought to the suffering hospitals by bus.

"Facing this unprecedented disaster, we gave our role as a university hospital the highest priority, and acted together. I think that we were able to show through our efforts that a university hospital is in an optimal position to act as the last resort for achieving normalization of regional medical systems," says Prof. Susumu Satomi, Director of Tohoku University Hospital.

Many things were learned from this earthquake. Retrofitting the university hospital buildings with seismic dampers was effective from the viewpoint of medical system maintenance. Further, it was learned that it is important to review procedures for organizing a triage* system, and prepare a process for managing an emergency task force through everyday training.

The hospital must be able to protect the lives of its more than 1,000 inpatients and 2,500 staff. Therefore it needs to stockpile at least a one-week supply of food and about a two-weeks supply of medicine, and strengthen its off-grid power system, etc.

The university hospital personnel divided their actions in response to the earthquake into four steps. The first step, on the day of the earthquake, was to ensure the safety of the inpatients and staff and establish an emergency triage system. The second step, up to one-week after the earthquake, was to restore the hospital's functions, support medical institutions around Sendai City, and continue providing triage. The third step, two to three weeks later, was to enhance support for medical institutions in and outside Miyagi Prefecture. The fourth step, from three weeks and onward after the disaster, was to develop a long-term medical care system for the shelters, and provide functional normalization for the suffering hospitals.

Prof. Satomi, Director of the University Hospital, led the disaster conference. He continuously explained the role and mission of the University Hospital, which oversaw medical services in the entire stricken area.

In Miyagi Prefecture, 6 public hospitals (588 beds) suffered catastrophic damage and 62 clinics were fully destroyed.

In order to dispatch medical teams and supply necessary goods to the areas where the damage was serious in Miyagi Prefecture, the university prepared and maintained its own means of transportation. The photograph shows a departing university bus.

Vice President, Director of the Tohoku University Hospital,
Director of the Innovation of New Biomedical Engineering Center

Susumu Satomi

Born in Kagoshima Prefecture in 1948, Graduated from the School of Medicine, Tohoku University. M. D. Worked as a Lecturer at the Second Department of Surgery and then as Professor at the Second Department of Surgery since 1995. Appointed as Professor of the Division of Advanced Surgical Science and Technology, Graduate School of Medicine, Tohoku University, Director of Tohoku University Hospital in 2004, Vice President of Tohoku University in 2005, Director of the Innovation of the New Biomedical Engineering Center in 2008, and President of the Japan Surgical Society in 2008.

Tohoku University Hospital **http://www.hosp.tohoku.ac.jp/**
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http://www.hosp.tohoku.ac.jp/sinryou/s13_isyoku_sai_nai.html

* -- Triage: An approach to give the priority for medical treatment and conveyance to sick and injured people in mass casualty situations.

Processing radioactive contaminated water using domestic zeolite

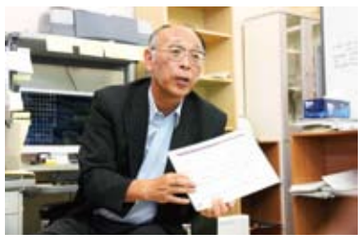
Prof. Hitoshi Mimura is currently studying radioactive waste disposal, ion exchange selectivity of zeolite, etc. In 1986 at a seminar in his loboratory, he reported on an adsorption experiment in which he used various types of zeolite, clay, titanic acid, etc. in order to separate cesium contained in sea water. This report, however, was not published.

25 years after that, the Fukushima Daiichi Nuclear Power Plant accident occurred due to the Great East Japan Earthquake. It generated a highly contaminated mixture of water and sea water in the nuclear reactor, turbine building, etc. Processing this contaminated water, which is expected to amount to not less than 200,000t, has become a hindrance to restoration work.

Prof. Mimura promptly began working together with the Japan Atomic Energy Agency (JAEA) and a team of volunteers* in order to determine whether the experimental data of 25 years ago was correct. Experiments for over 600 adsorbents were carried out with regards to separation and decontamination of cesium, strontium, and iodine. The experiments showed almost the same results as the 1986 experiment's data. The data was released on the Atomic Energy Society of Japan (AESJ) website.

"Zeolite was used to process waste in the 1979 Three Mile Island accident. It is produced domestically in large quantities and is inexpensive. Sendai prides itself on its Zeolite from Ayashi, which is some of the best in the world. I am sure that situational convergence is by no means impossible," says Prof. Mimura.

Although in Japan zeolite ore is plentiful, Sendai prides itself on its Omori Kami-Ayashi zeolite, which has very high purity, and is some of the best quality zeolite in the world. The photograph shows zeolite ore from Ayashi.



Uranium research elucidated the present principles of nuclear fission and in addition, enabled us to trace the origins of the elements. Prof. Mimura tells students about the importance of the discovery of uranium, which made a great contribution to the progress and development of modern science, at a lecture.

Prof. Mimura has been studying zeolite from his school days.

Professor, Nuclear Energy Flow Environmental Engineering, Safety Engineering of Nuclear Systems, Quantum Science and Energy Engineering, Graduate School of Engineering

Hitoshi Mimura

Born in Fukushima Prefecture in 1950. Graduated from the doctoral course of the Department of Nuclear Engineering, School of Engineering, Tohoku University. Ph.D in Engineering. Worked as Research Associate at the Research Institute of Mineral Dressing and Metallurgy, Tohoku University, and then Associate Professor (former Assistant Professor) at the Institute of Multidisciplinary Research for Advanced Materials, Tohoku University. Has been in his current position since 2003.

http://michiru.qse.tohoku.ac.jp/

* -- Japan Atomic Energy Agency, Hokkaido University, Tohoku University, Tokyo Institute of Technology, Kyoto University, Kyushu University