

2011.3.11 Record Collection

CHAPTER

4

Additional Material/  
Table of the Situation in  
the Six Blood Centers  
in the Tohoku Region

1.Table of Damage at the Six Blood Centers

	Aomori Blood Center	Iwate Blood Center	Miyagi Blood Center
Seismic intensity *:	Scale: 4 (Aomori City) 5 Upper (Hachinohe City) (5 Upper ; maximal in the prefecture)	Scale: 5 Upper (Morioka City) (6 lower; maximal in the prefecture)	Scale: 6 Upper (7 ; maximal, in Miyagi Prefecture)
Tsunami height ** *** **** *****:	Scale: 8.4 m (Hachinohe City)	Scale: 8-9 m in Miyako City (40.5 m; Run-up height in Miyako City)	Scale:14.8 m in Onagawa-cho 5.0 m in Ishinomaki City 8.0 m in Shiogama Ciy 5.7 m in Sendai Airport 6.7 m in Yuriage fishing port:
Damage:	gate was damaged (Hachinohe Center)	Several cracks on the outer walls of the blood center	Fall of ceilings, etc. (in many points) Partially collapsed paving of garages Partial destruction of outer walls (east partially) Rupture of pipes (at several points), etc. Two cars turned over without damage One Van submerged
Electricity:	Power failure (Aomori Prefecture) Switch to Emergency power supply	Power failure (Iwate Prefecture); from 14:46 on March 11 to the evening of the next day Switched to the emergency power supply.	Power failure; 1)2:46 p.m. on March 11 to 7:36 a.m. March12, 2011 2)11:32 p.m. on April 7 to 8:28 a.m. on April 8, 2011
Gas provision:	No trouble	No trouble	Stopped from 14:46 on 11th March to 15:35 on 27th March
Water supply: Drainage:	Water supply: No trouble Drainage: No trouble	Water supply: No trouble Drainage: No trouble	Stopped from 14:46 on 11th March to 09:30 on 22th March Drainage: Damage to and leaking of waste water
Examination/ Production:	Unable to separate due to the power failure	Already integrated to the Miyagi Blood Center by March 11, 2012	The main unit and transport line of CL4800 were displaced (adjustment/inspection: 9 days, required) One platelet shaker turned over and was damaged (It took 20 days until a new unit could be purchased) The breaker of one x-ray system was damaged (31 days) Four x-ray systems were displaced (26 days) Weighing device monitor (Unworkable and replaced with another monitor) Validation of CL4800, LABOSPECT, and PK7300 (9 days) X-ray system (One day×2 times for repair, including a second repair aftershock on April 7) Clean bench (5 days for environmental monitoring) Storage facility for blood preparation (cold room) (3 days) Storage facility for blood preparation (freezer) (3 days) Fixation or non-slip fixation of falling or displaced objects including PCs CL4800/1 unit: reinforcement of piping and introduction of base isolator for models with damage are under consideration (for x-ray system, the manufacturer is being asked about quake resistance measures)

\*Data source: Monthly Report on Earthquakes and Volcanoes in Japan March, 2012

\*\*Data source; Tsunami height was obtained from the Japan Weather Association

\*\*\* Data source; Run-up height was obtained from the Tsunami Joint Survey Group Nationwide Field Survey

\*\*\*\* Data source: Documentation by the Port and Airport Research Institute

Akita Blood Center	Yamagata Blood Center	Fukushima Blood Center	Hyogo Blood Center
Scale: 5 (Akita City) (max. 5 Upper in the prefecture)	Scale: 4 (Yamagata City) (also 4 in aftershock which occurred on April 7, 2011)	Scale: 6 (Fukushima City) (6 Upper;maximal in the prefecture)	Scale: 7 (Kobe City) (7 ; maximal in the prefecture)
No problems	None	13.1 m at Fukushima Daiichi Nuclear Station	No problem
No problems	None	Ceilings partially fell down (Koriyama Blood Donation Room) Ground of the site in Fukushima Blood Center was subsided The jack of the bloodmobile was damaged	1) Examination and preparation equipment of the Hyogo Blood Center fell down and broke. The platelet shaker turned over and was damaged. Shaking equipment for platelets fell down and broke. Examination equipment collided and broke. 2) Blood donation room on the 4th floor of the building collapsed (in Sannomiya City) 3) Delivery vehicle parked in basement floor of car park building fell over
Power loss for 18 hours	Power loss for 18 hours	No loss of Power in Fukushima City (Loss of power after quake on April 7, 2011)	Blackout for 18 hours 17 minutes
No problems	No problems	No problems	Not supplied for 48 days
Water supply: No problems Drainage: No problems	Water supply: No problem Drainage: No problem	Water supply: Stopped for 18 days in Fukushima City Stopped for 28 days in Iwaki City Drainage: No problems	Water supply: Not supplied for 8 days Drainage: Not mentioned
Ceased manufacturing activities during the loss of commercial electric power for 18 hours	Already integrated to the Miyagi Blood Center by March 11, 2011	Already partly integrated to the Miyagi Blood Center Partly stopped by the requirement of the Blood Service Headquarters Validation was required before resumption	Took several months to resume the function of examination and preparation of the Hyogo Blood Center.

	Aomori Blood Center	Iwate Blood Center	Miyagi Blood Center
<b>Communications:</b> 1) Telephone in the hospital 2) Telephone in the Blood Service Headquarters 3) E-mail	1) Use of disaster priority telephone  2) Use of disaster priority telephone	1) Disaster Priority Telephone General phone was resumed the day after the disaster inland, whilst it took one week to resume in coastal areas 2) Disaster Priority Telephone 3) Direct mail to the Chief Executive Officer Nishimoto, because emergency e-mail numbers for the Blood Service Headquarters have not been provided	1) Telephone lines were disconnected for a minimum of one day and maximum of seven days. 2) There was no disconnection with the Headquarters, and the viability of communications was confirmed by calling the headquarters immediately after the earthquake. 3) Mail order was allowed for two medical facilities for 14 days. Internet and e-mail communications were resumed in the early morning of March 14, 2011
<b>Transport Links:</b> 1) Shinkansen 2) Expressway 3) Ordinary road	1) Shinkansen was stopped 2) Expressways were stopped 3) Traffic jam	1) Resumed on April 25, 2011 2) Resumed on March 22, 2011	1) Stopped for 29 days from Sendai to Ichinoseki, 45 days Sendai to Tokyo, and 50 days Sendai to Aomori. 2) General vehicles were prohibited from using the expressways (14 days) Emergency vehicles were also prohibited from using the expressways (1 day)
<b>Supplies:</b> 1) Daily commodities 2) Gasoline	1) Lack of daily commodities 2) Lack of gasoline	1) Resupplied after around 2 weeks 2) Normal supply resumed from around April 3	1) Continued extreme shortage for 21 days. 2) Continued extreme shortage for 21 days.
<b>Hospital performance:</b> 1) General 2) Surgical procedure	2) Surgical procedure restraint	1) Yamada, Otsuchi, and Takada Prefectural Hospitals in the coastal areas were collapsed. 2) Surgical procedure: Temporarily stopped in Kamaishi and Daito Prefectural Hospital.	1) Loss of function of hospitals in the coastal area for between 10 days and 6 months including Tohoku Kosei-Nenkin Hospital, Sen-en Hospital, Ishinomaki City Hospital, Ogatsu Hospital, Shizugawa Hospital (in Minamisanriku-cho). 2) restricted to regular surgery for 8 to 10 days.
<b>Blood collection:</b> 1) Resumption of the donation room 2) Resumption of the bloodmobile 3) Donor	1) Donation room resumed operations on March 13 2) Bloodmobile resumed operation on March 13	1) Opened on 20th April (stopped for 39 days) 2) Opened on 18th April (stopped for 37 days), but could not go to the coastal areas.	1) Closed for 37 days or 46 days. 2) Out of action for 50 days. 3) Number increased by 20% on the first day of resumption of first donation room (37 days)
<b>Blood supply:</b> 1) Demand 2) Supply 3) JRC Chapter support	1) Demand reduced by 10% 2) All PCs were supplied	1) Demand for red blood cells reduced by about 10% (for around 1 month) 3) *Considering the way to contribute to the affected areas	1) Reduced by 50% for 7 days and. by 90 % for further 8 to 21 days. 2) Human assistance, supported for 30 days. Blood preparation, supported for 65 days. 3) Circuit blood supply, supported for 12 days (from immediately after the earthquake on March 11 to March 23)
<b>Response to nuclear station:</b>		Grass in fields was slightly affected by nuclear contamination	Grass in fields was affected by nuclear contamination
<b>Required improvement measures:</b> (In order of importance)	<ul style="list-style-type: none"> <li>Fuel/Energy requirements to be met (including privately-owned electric power)</li> <li>Maintenance of crisis management manual</li> <li>Maintenance of correspondence procedure (including satellite phone)</li> </ul>	<ul style="list-style-type: none"> <li>Logistical support to the blood center activity for gasoline and food</li> <li>Maintenance and training for the emergency systems</li> </ul>	<ul style="list-style-type: none"> <li>Securing viable communications immediately after the earthquake. (to communicate with: Headquarters; the other blood centers; medical facilities; personnel responsible for delivery.)</li> <li>Establishment of emergency network system in the event of occurrence such as a natural disasters. Network to be centered at the preparation office of the core blood center.</li> <li>Staff mobile mail addresses for those in the preparation division should have been obtained by the deputy director or director of the division</li> <li>Rehearsal of emergency communications</li> <li>Mastering the Emergency Management Guidelines issued by Blood Service Headquarters</li> </ul>

**Additional Difficulties at the Fukushima Blood Center:** The Fukushima Area was designated as an evacuation zone, planned evacuation zone or emergency evacuation preparation zone as a result of the accident at Fukushima Daiichi Nuclear Station, until the emergency evacuation preparation zone was cancelled on September 30. However, medical facilities there were forced to close down or downsize their operations, and the reduction in the numbers of health care professionals including doctors and nurses brought about a serious situation. It was also not clear whether the blood supply would recover. The administrative institutions of 8 towns and villages were still being moved to other municipalities in- and outside Fukushima, and companies also in the process of closing or moving. Such situations do not allow for blood donation. To ensure safety and security, first, coordination of the nuclear accident response and decontamination are required, and blood service activities cannot be undertaken until these first steps have been taken.

Akita Blood Center	Yamagata Blood Center	Fukushima Blood Center	Hyogo Blood Center
1) Difficulties with telephone communications persisted for three days after disaster. 2) Not mentioned 3) Not mentioned	1) Difficulties with telephone communications persisted for three days after disaster. 2) Not mentioned 3) Not mentioned	1) Took a long time to connect even for priority telephone links following the disaster. Pay phone could be relatively easily connected, and we stood in lines at convenience stores to make contact.	1) Communications were disconnected for 15 hours 10 minutes.
1) Stopped for 31 days (Akita Shinkansen started again on April 12, 2011) 2) Closed for 10 days, though emergency vehicle may go through. 3) Traffic was not stopped.	1) Stopped in the Yamagata Shinkansen for 31 days. It opened on April 12 2) Yamagata Expressway closed for 10 days, though emergency traffic could pass through. 3) Ordinary roads were passable.	2) Only emergency vehicles were allowed to pass.	1) The line from Shin-Osaka Station to Himeji Station was closed for 81 days. 2) Traffic was closed for a long time because of the collapse of the Hanshin Expressway. 3) All traffic was closed in Kobe City
1) Somewhat inconvenient to secure food and fuel.	2) Lack of gasoline for 15 days until March 26, 2011	1) Lack of food and daily commodities 2) Lack of gasoline	Commodities including water, food Gasoline were supplied from neighboring centers.
1) No problems 2) A patient who were going to get surgery in a major base hospital in Akita was transferred to Shizuoka, because the doctor in charge was not convinced he could obtain HLA-matched platelets in time (this was necessary for the operation), and a local newspaper reported this immediately after the disaster.	1) Not mentioned 2) Not mentioned	1) All medical facilities were closed in the zone within 20 km from the Fukushima Daiichi Nuclear Station. For the emergency evacuation preparation zone, medical staff (nurses and doctors) evacuated so medical facilities had to restrict their activities. 2) Some medical facilities were closed, and their size was reduced	1) Of 2,926 medical facilities in Kobe City: 239 were fully collapsed; 270 were half collapsed; 13 were fully or half burned; 973 had damage to their infrastructure for 973. A total of 1,495 service providers (51.1%) were therefore out of action for one of these reasons.
1) Resumed 1.5 to 5 days after the disaster in Akita Prefecture. 2) Resumed 3 days after the disaster. 3) Increase in the mean number of donors by about 10% for 100 days after the disaster.	1) Donation room was resumed (1 day) 2) Bloodmobile was resumed (1 day) 3) Number of donors increased by 20% (60 days)	1) Resumed in the Fukushima Blood Center on April 18, Aizu-wakamatsu Blood Center on April 25, Iwaki Blood Center on April 26. 2) Resumed in Koriyama Station on May 9. 3) Mobile blood collection was open on May 1.	1) Closed for 20 days after the earthquake (Akashi Donation Room and Tsukaguchi Donation Room) and for 205 days after the earthquake (Sannomiya Donation Room) 2) Stopped for 34 days after the earthquake (after which it was mainly allocated to the northern area) 3) Reduced by 30 to 40% for two weeks after the earthquake, followed by 10 to 30% for the next two months
1) A large variation was observed. 2) Platelet products were distributed from the Tokyo Metropolitan Blood Center. 3) Support for the JRC Akita Chapter	1) Demand was up 104% for 90 days compared to that of previous year. 2) Blood was received from the Tokyo Metropolitan Blood Center for 90 days after disaster. 3) Support for the JRC Yamagata Chapter	2) Haranomachi Blood Station evacuated because of the nuclear station accident 3) Support for the JRC Fukushima Chapter	2) From neighboring centers, 14 cases (274 units) 3) Support for the JRC Hyogo Chapter
None		Haranomachi Blood Station evacuated Iwaki Blood Office was closed, and its FFP inventory was moved on March 18.	None
<ul style="list-style-type: none"> <li>Maintenance of emergency electric power supply (Air-cooled power generators should be installed)</li> <li>Fuel should be secured (including agreements with gas stations)</li> <li>Maintenance of communication equipment applicable to emergencies (including satellite phone)</li> <li>Maintenance of various regulations (related to risk management and response)</li> </ul>	<ul style="list-style-type: none"> <li>Fuel to be secured in each block</li> <li>Improvement of emergency communication system</li> <li>Maintenance and training in use and application of the emergency system</li> <li>Consider how best to assist the affected areas</li> </ul>	<ul style="list-style-type: none"> <li>Electric power: Mutual fuel usage by the bloodmobile and the emergency power generation system has an advantage for maintaining function of the blood center during any restriction in gasoline supplies after a disaster.</li> <li>Water supply: A water supply is the second lifeline essential to maintaining the function of the blood center. The center may be better prepared for disaster, by provision of a water reservoir, potential well, or a direct pipe from the river.</li> <li>Communication: Consider introducing satellite phones</li> <li>Expressway: Helicopters may help transportation of the blood between blood centers.</li> <li>Ordinary roads: considering alternative roads (including back roads) and motorcycles (such as those used by home-delivery services).</li> </ul>	<ul style="list-style-type: none"> <li>Communications with medical facilities promptly to be established</li> <li>Disaster measures to be organized by each region or nationally</li> <li>Development of Emergency Management Guideline</li> <li>First-responders to be ascertained</li> <li>Disaster training to be carried out in cooperation with the JRC Branches</li> <li>Maintenance of new facilities, etc.</li> </ul>

2. A Record of the Time Table of the Events in the Six Blood Centers

	Aomori Blood Center	Iwate Blood Center	Miyagi Blood Center	Akita Blood Center	Yamagata Blood Center	Fukushima Blood Center
March: 12	Whole blood donation: stop Apheresis for platelet: stop	Whole blood donation: stop Apheresis for platelet: stop	Whole blood donation: stop Apheresis for platelet: stop	Whole blood donation: stop Apheresis for platelet: stop	Whole blood donation: stop Apheresis for platelet: stop	Whole blood donation: stop Apheresis for platelet: stop
March: 13 ~	Whole blood donation: start Apheresis for platelet: stop (D)	Whole blood donation: start Apheresis for platelet: stop (D)	Whole blood donation: start Apheresis for platelet: stop (D)	Whole blood donation: start Apheresis for platelet: stop (D)	Whole blood donation: start Apheresis for platelet: stop (D)	Whole blood donation: start Apheresis for platelet: stop (D)
April: 8	Whole blood donation: stop					
April: 9 ~	Whole blood donation: start					
April: 18 ~		Whole blood donation: start	Whole blood donation: start Apheresis for platelet: start (D)	Apheresis for platelet: start (D)	Apheresis for platelet: start (D)	Whole blood donation: start Apheresis for platelet: start (D)
April: 20 ~		Apheresis for platelet: start (D)				
April: 29 ~	Apheresis for platelet: start (D)					

Abbreviation:  
D; Direction of Blood Service Headquarters