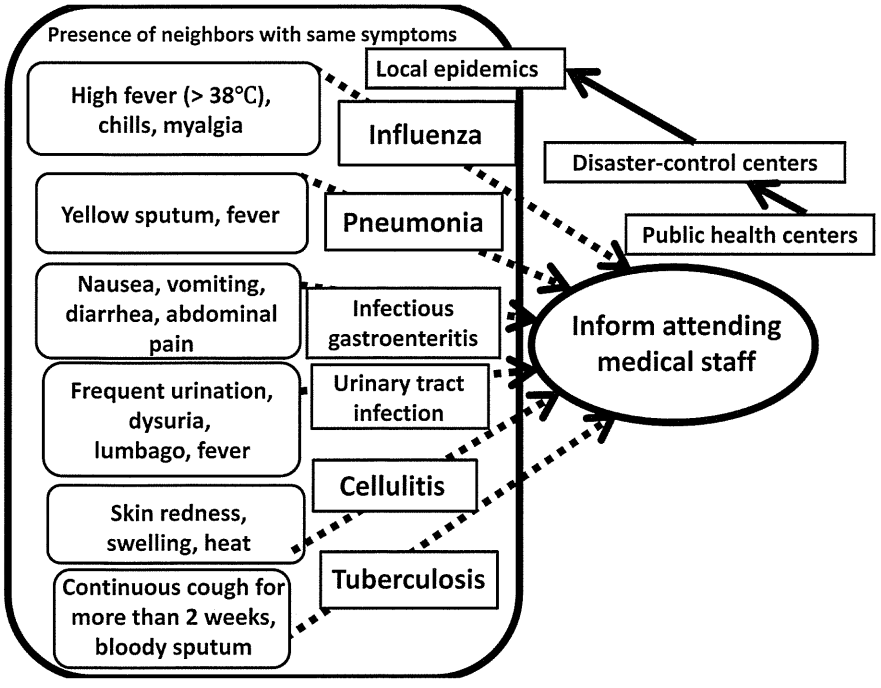

Figure 2 Measures to rapidly detect infectious diseases.

- Continue usual drugs including anticoagulation drugs if possible.
- In cases of unidentified medical conditions because of loss of an elderly person's prescription record, medical staff should be consulted.
- Anticoagulation drugs are generally essential. However, it is better to consult medical staff because it is necessary to check for external wounds or bleeding from the gastrointestinal tract, including stress-induced ulcer.
- CVD is strongly associated with hypertension. Measure BP regularly.
- No smoking is strongly recommended.
- Drink any fluid, including a lot of water, to prevent dehydration.
- A low-salt diet is strongly recommended. Endeavor to take dietary fiber in vegetables including seaweed and mushrooms.
- Endeavor to do any type of exercise or walk for at least 30 minutes a day regularly.
- Prevent constipation.
- Be careful about changes in temperature, especially in winter.

3. Infectious diseases

Signs and symptoms of infectious diseases

It is useful to have information on epidemics of infectious diseases in stricken areas before and after disasters, in order to quickly detect illness. In particular, this measure is beneficial for diseases, such as influenza, food poisoning and viral gastroenteritis, with a short incubation time from infection to the onset of symptoms (i.e. several hours up to 3 days). Pay special attention to elderly persons with these symptoms and immediately inform medical staff if there is suspicion that an elderly person has such an illness. In relation to this point, it is important to collect epidemiological information from district public health centers through disaster-control centers (Fig. 2).

In fact, many evacuees in shelters developed vomiting and diarrhea after the 2007 Noto Peninsula Earthquake. It was possible to immediately predict an outbreak of norovirus gastroenteritis among evacuees since a local epidemic of this infectious disease had already been observed in the Noto area before the quake.

However, local epidemics are not always useful for detecting infectious diseases, particularly those with a long incubation period (i.e. several months up to 2 years) such as pulmonary tuberculosis.

Measures to prevent transmission of infectious agents in shelters

- The environment in shelters induces an increased risk for outbreaks of infectious diseases because many evacuees are living together in a very limited space.
- It is very important to wash hands and gargle as standard precautions. Please apply hand disinfectant when it is not possible to use water. It is essential to wash hands or use hand disinfectant after using the toilet.
- NMCP, PHN, or CSW should not directly touch human bodily fluids (e.g. blood, urine, feces, nasal discharge, and sputum) with their hands because the fluids may include infectious microorganisms.

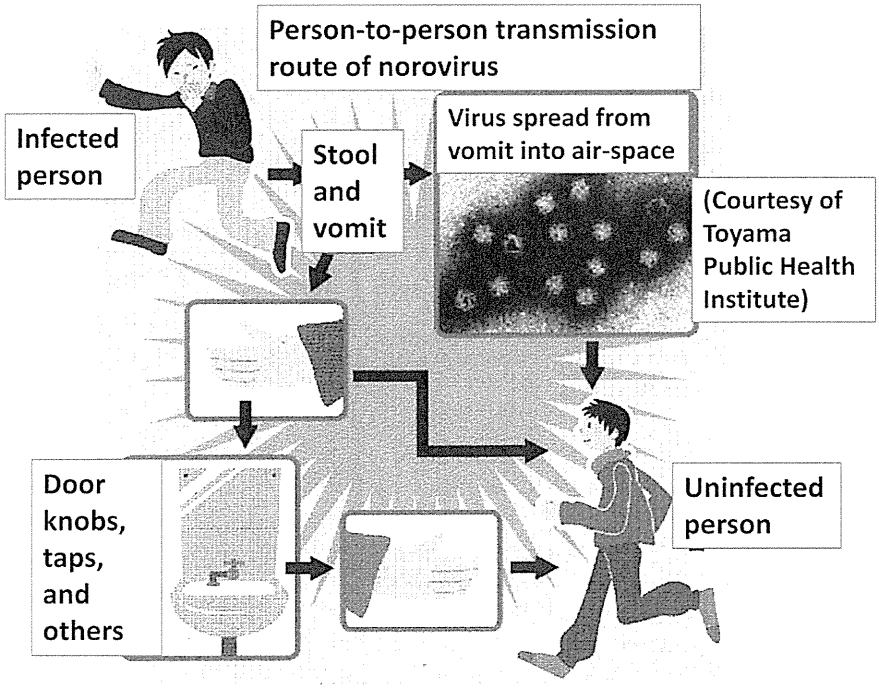

Figure 3 Person-to-person transmission route of norovirus.

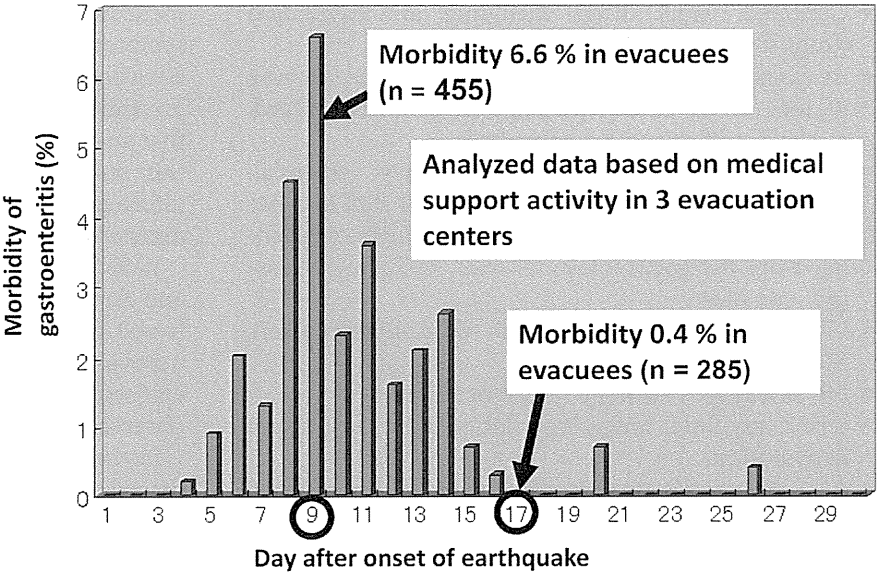

Figure 4 Morbidity of gastroenteritis in evacuees in shelters after the 2007 Noto Peninsula Earthquake.

If NMCP, PHN, or CSW are aware that the environment (floors in shelters, portable toilets, and temporary water-suppliers) has been contaminated with vomitus or diarrheal matter, contact medical staff. Do not clean the contaminated environment yourself. The staff can deal with this using 0.1% sodium hypochlorite disinfectant.

- Norovirus can spread via person-to-person transmission and lead to gastroenteritis outbreaks (Fig. 3).[7] However, it is unnecessary to isolate subjects with gastroenteritis from the stricken areas. The outbreak in shelters after the Noto quake was quelled after one week of interventions including personal hand hygiene, gargling, and the use of disinfectant on environmental surfaces (Fig. 4).[8]

In addition, respiratory hygiene (cough etiquette) is recommended to prevent respiratory infections.[9] With respect to coughing, rhinorrhea, sneezing, and sputum, please instruct evacuees to behave as follows: (i) use a tissue to cover your mouth and nose when you cough or sneeze (Fig. 5); (ii) drop used tissuew in a special waste basket; and (iii) wash your hands with soap and warm

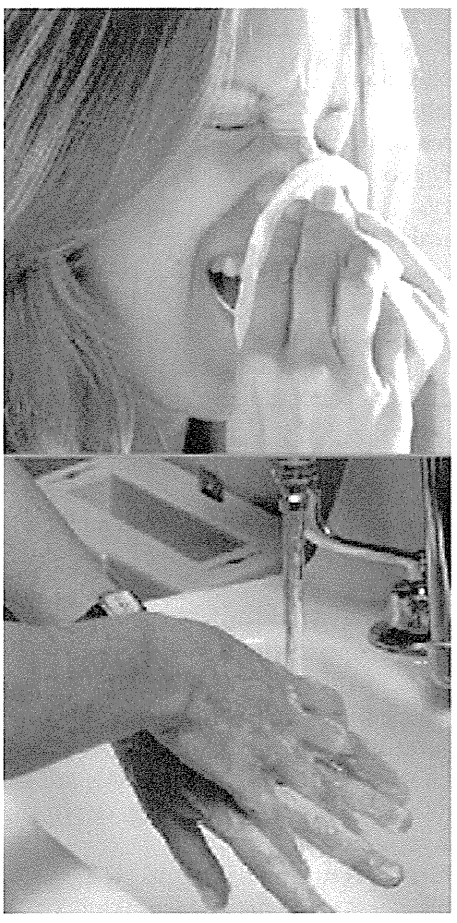

Figure 5 Respiratory hygiene (cough etiquette).

water or clean with alcohol gel or wipes since your hands may be contaminated with secretions (Fig. 5). Elderly people who frequently cough or sneeze should be asked to wear a surgical mask provided by medical staff. Please keep a distance of more than 1 m between symptomatic subjects and others.

4. Dehydration

Signs and symptoms of dehydration

If an elderly person has some of the more severe symptoms of dehydration listed below, call medical staff immediately.

- Muscle weakness
- Physical fatigue
- Increased body temperature
- Decreased urine production
- Dry skin, even under the armpits.

Measures to prevent dehydration in shelters

- When elderly people feel thirsty, they are already dehydrated, so do not restrict water intake.
- To prevent dehydration, an elderly person without particular illness such as heart failure or kidney failure simply needs to replenish fluids with at least one liter of water per day.
- When elderly people have any of the risks for dehydration listed in Table 1, they should be carefully assessed by a doctor for dehydration.

Table 1 Risks for dehydration in the elderly

Inability to feed oneself
Appetite loss (decrease in food intake)
Swallowing problems
Diarrhea or vomiting
Thirsty or dry mouth
Taking a diuretic
Increased body temperature
Decreased urination
No air conditioning/not using air conditioning
Limitation of water intake to avoid frequent urination

5. Malnutrition

Signs and symptoms of malnutrition

When an elderly person has any of the risks for malnutrition listed below, the person should be carefully assessed by medical staff.

- Consumed less than half the usual dietary intake for at least 1 week
- Diarrhea or vomiting for more than 2 or 3 days
- Decrease in body weight of more than 5% for 2 weeks
- Insufficient intake or dysphagia due to inadequate food
- Receiving enteral or parenteral nutrition.

Measures to prevent malnutrition in shelters

The following general precautions to prevent malnutrition should be considered:

- Adequate food supply
- Adequate types of food consumed
- Adequate feeding assistance
- Dental issues such as gum disease, cavities, and poorly fitting dentures
- Regular assessment of nutritional status and weight loss.

6. Gastrointestinal disorders

Signs and symptoms of gastrointestinal disorders

When elderly evacuees have any of the signs and symptoms of gastrointestinal disorders listed below, they should be carefully assessed by medical staff.

- Upper central abdominal pain after meals (on suspicion of stomach ulcer)
- Upper central abdominal pain when hungry (on suspicion of duodenal ulcer)
- Gastric discomfort

- Appetite loss
- Heartburn
- Tarry (black) stool or blood in the stool.

Measures to prevent gastrointestinal disorders in shelters

The following general precautions to prevent gastrointestinal disorders should be considered:

- Avoid psychological stress.
- Eat substantial meals at regular mealtimes.
- Wash hands, gargle, and disinfect cooking utensils to prevent infectious enteritis.
- Flush or discard any vomit, and change diapers with rubber gloves while wearing a flu mask. Thoroughly clean and disinfect contaminated surfaces with a bleach-based household cleaner immediately after an episode of illness.
- Drink sufficient liquid and take a lot of exercise to avoid constipation.
- Do not ignore the urge to defecate and maintain a regular bowel habit.

7. Diabetes mellitus (DM)

7–1). Hyperglycemia

Signs and symptoms of exacerbation of DM

If elderly people have any of the symptoms described below, their DM might be worsening. Please contact medical staff if any of the following symptoms are detected:

- Frequent urination
- Increasing incontinence
- Thirst
- Fatigue
- Not looking well.

Measures to prevent exacerbation of DM in shelters

- Eat meals regularly and take medication with meals.
- Patients with DM type 1 should not skip basal insulin injections.
- Drink enough water to prevent dehydration.
- If someone has a fever or little appetite, monitor blood glucose more frequently than usual or consult a doctor promptly.

7–2). Hypoglycemia. In addition, if elderly evacuees are taking hypoglycemic medication, be alert for symptoms of hypoglycemia.

Signs and symptoms of hypoglycemia

The symptoms described below might be caused by hypoglycemia. Please contact medical staff if any of the following symptoms are detected:

- Strong feeling of hunger
- Cold sweats
- Palpitations
- Weakness
- Sleepiness
- Slurred speech
- Blurred vision
- Convulsion.

Measures to prevent hypoglycemia in shelters

- Elderly people should avoid exercise or working when hungry.
- Eat meals regularly.
- Eat carbohydrates (e.g. rice, bread, noodles, or potatoes).
- If people cannot eat a meal, they should reduce or skip their hypoglycemic medication.
- Set a higher goal of glucose control (150–200 mg/dL) than usual.

Tips to treat hypoglycemia in shelters

- NMCP, PHN, or CSW should ask those with the above symptoms to take a glucose tablet.

8. Bronchial asthma

Signs and symptoms of exacerbation of bronchial asthma

If elderly people have any of the following symptoms, bronchial asthma might be worsening. Please contact medical staff if the following symptoms are detected:

- Paroxysmal wheezing or coughing, or reoccurrence of these symptoms
- Breathlessness during the night
- Breathlessness when moving, speaking, or lying down
- Cyanosis or edema
- Drowsiness.

Measures to prevent exacerbation of bronchial asthma in shelters

- Let NMCP, PHN, CSW, or medical staff know that if an elderly person is taking medication.
- Continue taking medicine.
- Wash your hands and gargle regularly, wear a mask if available, and be careful about infectious diseases such as colds.
- Keep warm.

9. Chronic obstructive pulmonary disease (COPD)

Signs and symptoms of exacerbation of COPD

If an elderly person has any of the following symptoms, COPD might be worsening. Please contact medical staff if the following symptoms are detected:

- Increased respiratory rate and shortness of breath
- Worsening of dyspnea on exertion or at rest
- Increased frequency or severity of cough and excessive sputum production
- Mucopurulent sputum (change in sputum character)
- Cyanosis or edema
- Drowsiness.

Measures to prevent exacerbation of COPD in shelters

Figure 6 Ares where pain occurs due to urinary tract diseases.

- Let NMCP, PHN, CSW, or medical staff know if an elderly person is taking medication.
- Continue taking medication and inhaling bronchodilators.
- Avoid exposure to smoke and dust.
- Try to wash your hands and gargle regularly.
- Keep warm and do not stay in the cold.

10. Chronic kidney disease (CKD)

Signs and symptoms of CKD

If elderly evacuees have any of the following symptoms, CKD might be worsening. Please contact medical staff if the following symptoms are detected:

- Inactivity, fatigue, or weakness
- Edema
- Appetite loss
- Nausea and/or vomiting
- Pruritus.

Measures to prevent CKD in shelters

- Let NMCP, PHN, CSW, or medical staff know if an elderly person is taking medication.
- Continue taking medicine.
- Have regular blood pressure checks.
- Restrict salt intake.
- Drink enough water to prevent dehydration.
- Keep warm.
- Be careful about infectious diseases such as colds.

11. Urinary diseases

Signs and symptoms of urinary diseases

If an elderly person experiences some of the more severe symptoms of urinary diseases listed below, call medical staff immediately.

- Pain on urination
- Lower abdominal pain (Fig. 6)
- Back pain, lumbago (Fig. 6)
- No urination for half a day or longer
- Distention of lower abdomen
- Bloody urine
- Cloudy smelly urine
- Frequent urination
- Incontinence
- High fever (in cases of pyelonephritis, 38°C or higher)
- Limiting water intake in order to avoid frequent urination or incontinence.

Measures to prevent urinary diseases in shelters

- Replenish fluids with at least one liter of water per day in persons without particular illness such as heart failure or kidney failure.
- Do not avoid going to the toilet.

12. Post-traumatic stress disorder (PTSD)

Signs and symptoms of PTSD

Please contact medical staff if an elderly person has any of the following symptoms. Please contact medical staff if the following signs are detected:

- Sudden change in personality
- Absent-mindedness and the inability to respond quickly
- Restlessness
- Frequent hyperventilation
- Frequent palpitations
- Panic attacks.

Measures to prevent PTSD in shelters

- If elderly people feel distressed or pain, they should confide in someone (a medical staff member, NMCP, PHN, or CSW).
- It may be necessary for the elderly to take medication if they cannot sleep or feel distressed and there is no alternative.

13. Depression

Signs and symptoms of depression

It is not unusual for an elderly person to experience grief after suffering from severe stress. Please contact a medical staff member if the following symptoms of depression are detected:

- Cannot help thinking of bad things
- Not knowing what to do despite actually having many things to do
- Feeling too sluggish to move, although the results of a medical checkup and blood tests are normal
- Unable to sleep at night
- Always thinking of dying.

Measures to prevent depression in shelters

- It is important to maintain a routine, including waking up and going to sleep at the same time daily.
- If elderly people feel distressed or pain, they should confide in someone (a medical staff member, NMCP, PHN, or CSW).

- It may be necessary for the elderly to take medication if they cannot sleep or feel distressed and there is no alternative.
- If an elderly person has been attending a clinic for the treatment of depression, please tell a medical staff member. It is important that the person continues to receive treatment.

14. Behavioral and psychological symptoms of dementia (BPSD)

Signs and symptoms of BPSD

Please contact a medical staff member if the following symptoms of dementia are detected:

- Restlessness and speaking in a disjointed manner
- Paranoid or having delusions (e.g. a false idea of being robbed)
- Becoming angry or starting to cry suddenly.

Measures to prevent BPSD in shelters

- Create an environment in which dementia patients can spend time with familiar people.
- Prepare a quiet environment so that dementia patients can get adequate sleep at night.
- Preparations should be made so that a dementia patient can be transferred to a professional medical institute when psychological symptoms or behavioral abnormality is observed.

15. Delirium

Signs and symptoms of delirium

Please contact medical staff if any of the following physical symptoms are detected in elderly persons who had previously been well and not experienced any decrease in cognitive function:

- Speaking or behaving in an erratic manner
- Absent-mindedness or being distracted
- Emotional instability (e.g. becoming angry, starting to cry, or getting excited suddenly).

Measures to prevent delirium in shelters

- Particular attention should be paid to dehydration, infections, and other underlying physical disorders, which can cause delirium in the elderly. Please be aware that elderly people with physical disorders are potential delirium patients.
- Keeping the elderly company and talking to them to provide stimulation are effective for preventing lethargy during the daytime. At night, create a quiet environment to help them achieve a regular sleeping pattern.

16. Dental diseases

Signs and symptoms of dental diseases

If an elderly person is showing some of the more severe symptoms of dental disease listed below, call medical staff immediately.

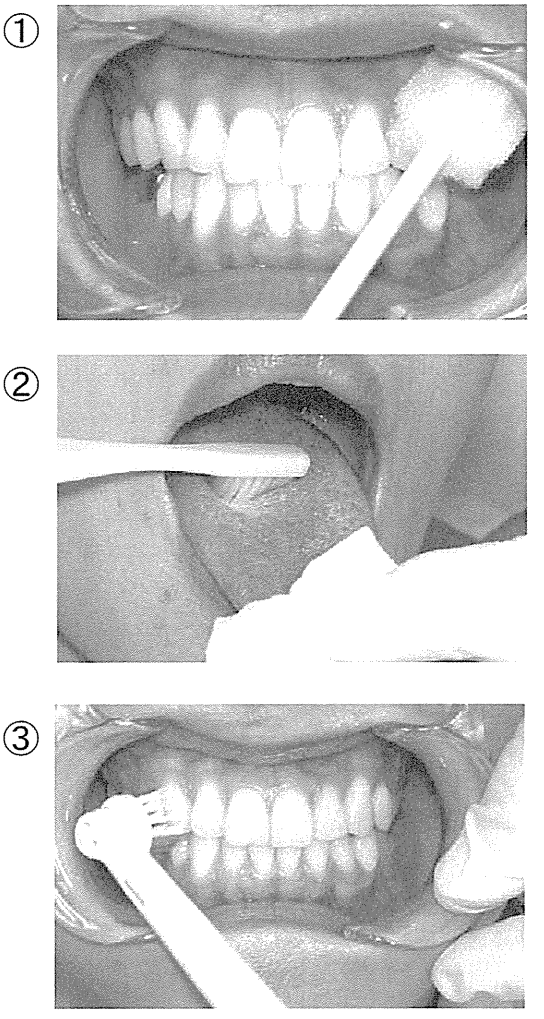

Figure 7 Systematic oral care program.

- Pain from dental caries
- Swelling and bleeding of the gingival
- Severe halitosis
- Fur on the tongue.

Measures to prevent dental diseases in shelters

- Keep cleaning the mouth.
- Brush the teeth every day.
- Those who are unable to do the above independently need to receive a systematic oral care program (Fig. 7)[10]
  1 Remove oral-mucosal and gingival saburra by using an oral care sponge for one minute.
  2 Remove fur from the tongue with a tongue brush for half a minute.
  3 Remove bacterial flora from the tooth surface with an electric toothbrush for 2.5 minutes, if an electric power supply is available.
  4 Rinse the mouth for 1 minute.

17. Functional inactivity

Signs and symptoms of functional inactivity

Elderly people often may not complain of their subjective symptoms accurately, or they may not be aware of a decline in their health. Thus, it is important for NMCP, PHN, or CSW to be aware of elderly persons' health conditions as well as the whereabouts of subjects who require support and/or nursing care.

If an elderly person shows some of the more severe symptoms of functional inactivity listed below, call medical staff and/or shelter staff.

- Being isolated, with no attempt to communicate
- Narrow range of activities and staying indoors
- Lying down all day long

Measures to prevent functional inactivity in shelters

- Encourage subjects to greet each other and make small talk in the shelter.
- Exercise regularly.
- Bend and stretch your arms and legs often, even in the narrow living space in the shelter.
- NMCP, PHN, or CSW should evaluate the reserve capability of elderly subjects with functional inactivity promptly.

18. Decubitus

Signs and symptoms of decubitus

NMCP, PHN, or CSW should actively survey the onset of decubitus ulcer, particularly on the hip, the backbone, the heel, and the back of the head, in bedridden subjects. Since this illness needs long-term management, contact medical staff and arrange transport to the hospital.

Measures to prevent decubitus in shelters

- Change bedridden subjects' position every 2 hours a day.
- Keep the skin clean.

19. Heat stroke

Signs and symptoms of heat stroke

In summer, pay special attention to heat stroke in elderly people in shelters. The main features are hot skin (body temperature ≥ 40°C) without sweat and drowsiness. Call medical staff immediately as this condition will cause fatality.

Measures to prevent heat stroke in shelters

- Keep cooling the neck or under the arms.
- Do not restrict water intake.

II. Signs of acute diseases in elderly

If any of the following symptoms is encountered in the elderly, they may be severely ill due to acute disease. These signs of acute diseases are sensitive enough to rapidly detect a severe state in elderly evacuees. NMCP, PHN, or CSW should consult attending medical staff immediately. Asterisks denote signs indicating the need for emergency transport.

1. Disturbance of Consciousness (Japan Coma Scale [JCS] Scoring)

- Rousable by being spoken to but reverts to previous state if stimulus stops (JCS II-10)
- Rousable with loud voice but reverts to previous state if stimulus stops (JCS II-20)
- Rousable only by repeated mechanical stimuli (JCS II-30)

* Unrousable using any forceful stimuli but responds to avoid the stimuli (JCS III-100 to III-300).

2. Shock

* Anemia (e.g. pallor of lips and/or nails)
* Bleeding due to external injuries
* Disturbance of consciousness (JCS III-100 to III-300)

- Abnormal skin turgor, a physical sign of dehydration
- Dry tongue

* A decline in BP: systolic BP < 90 mmHg
* An increase or decrease in pulse rate (i.e. resting pulse rate of more than 120 beats/minute or less than 50 beats /minute).

3. Dyspnea

- Shallow and rapid respiration, puffing (shallow breathing)
- Shoulder breathing (accessory muscle use)
- Flaring of wings of the nose and dilated nostrils (nasal alar breathing)
- Violet color to lips and nails (cyanosis)
- Wheezing or whistling while breathing (wheeze/stridor)
- Sleeping with the upper body raised in order to breathe (orthopnea)
- Weak breathing, suspended on occasion (apnea)
- Pursing the lips when exhaling (pursed lips breathing)

* Collapse of supraclavicular or intercostal spaces when inhaling (inspiratory retraction)
* Distension of the abdomen/shrinking of the chest when inhaling, and shrinking of the abdomen/ distension of the chest when exhaling (seesaw breathing)
* Obvious asymmetric movement of the chest during respiration
* Respiratory rate less than 10/minute or more than 30/minute.

4. Acute abdomen

* Uncontrollable abdominal pain

* Hematemesis, vomiting blood
* Tarry (black) stool, visibly bloody stools not due to hemorrhoids
* Frequent vomiting
* Abdominal swelling, abdominal distension
* Severe anemia (pallor of face or lips).

5. Neurological abnormalities.

* Motor disturbance including hemiparesis/hemiplegia/numbness, muscle weakness of the face (central facial palsy), eyelid drooping (ptosis)
* Aphasia (difficulty with verbal expression, auditory comprehension)
* Sensory or vibratory disturbance (unilateral)
* Visual field defect/hemianopia, double vision/polyopia
* Loss of balance when sitting, standing, or walking; loss of coordination
* Pupils not isocoric
* Convulsions or cramps.

6. Chest pain

* Chest pain, oppression, burning, or choking sensation in anterior chest
* Increasing frequency and worsening angina attacks compared with 2 weeks earlier
* Chest symptoms even at rest or at night
* Continuation (without improvement) of these symptoms in spite of aspirin or nitroglycerine use
* Duration of chest symptoms: more than 20 minutes.

7. Hypertensive emergency

* Hypertension (systolic BP ≥ 200 mmHg).

8. High fever

- Shivering (shaking chills) coinciding with high fever and potential severe infectious diseases (i.e. bacteremia)
- Burning forehead and poor response to being called.

9. Hematuria

- Red and/or tea-colored urine.

III. Symptoms of anxiety in elderly in shelters

If an elderly person is showing some of the symptoms listed below, immediately ask medical staff to assess the presence of serious diseases.

1. Dysphagia, difficulty in swallowing

- Coughing or breathing in food while swallowing
- Aspiration (i.e. escape of food or liquid into the lungs) or labored breathing while swallowing
- Recurrent pneumonia, respiratory infections, or choking experiences
- Wet vocal quality ("gurgly" voice) after swallowing
- Irritability during feeding or failure to thrive
- Prolonged feeding times (more than one hour)
- Unexplained weight loss.

2. Diarrhea

- Subject has diarrhea and a fever.
- Similar symptoms (diarrhea) are observed in surrounding evacuees.
- If diarrhea persists for two days or more, ask medical staff to assess, in order to avoid dehydration.

3. Constipation

- Change in bowel habit
- Constipation with abdominal pain
- Constipation for 2 or more days.

Discussion

On 11 March 2011, an earthquake with a 9.0 magnitude occurred off of Japan's Pacific coast and hit northeast Japan. The earthquake was followed by huge tsunamis, which destroyed many coastal cities.[11,12] A total of 14 841 people died in these events, and 10 063 persons are still missing as of 6 May 2011.[13] In addition, 109 086 homes were completely or partially destroyed, and 3970 roads were damaged.[13] There are still 119 967 displaced people (down from approximately 470 000 on March 14) living in shelters because of disrupted community utility services and/or health risks related to the nuclear power plant accidents in Fukushima.[13–15] Specifically, 37 482, 35 923, and 25 501 persons took refuge into the 357, 403, and 157 evacuation centers located in Iwate, Miyagi, and Fukushima prefectures, respectively.[13]

There were several reports concerning medical needs following the 2011 earthquake off the Pacific coast of Tohoku. For instance, reports have highlighted the importance of managing the exacerbation of chronic illnesses (e.g. hypertension, cardiac disease, DM, and chronic pulmonary disease) as well as dehydration in elderly evacuees, especially as it was difficult to source enough medication for their chronic illnesses.[16,17] Health workers should pay attention to the possible spread of acute diseases such as gastroenteritis, diarrhea, and other illnesses associated with dirty water.[16] In addition to physical health problems, it is important to rapidly detect long-term mental problems in the elderly (e.g. PTSD, depression, BPSD, and delirium) triggered by the disaster.[16,17] Medical specialists have indicated

that thousands of victims will be in need of long-term counseling to cope with the loss of their relatives, friends, and homes.[16]

There were some cases that previous guidelines failed to cover because of the unexpected phenomena following the Tohoku earthquake. Therefore, it is essential that we are mindful of the difficulties in establishing general guidelines that can cover a wide (and unexpected) range of disasters. Feedback regarding the booklets will need to be collected from NMCP, PHN, or CSW to assess the guidelines' usability. We further need to investigate the morbidity and mortality from disaster-related illnesses among the elderly in order to clarify efficacy of these guidelines.

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Conflict of interest

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TUG groups. The difference in SPMT score at the second follow-up lost significance after additionally controlling for the baseline value.

DISCUSSION

This study found that the gait speed and mobility were associated with global cognitive function after 3 years and were cross-sectionally associated with executive and memory functions. The results could suggest that slowing of mobility can be observed before decline in global function and coinciding with impairment in executive and memory functions in people aged 80 and older. These findings based on octogenarians and nonagenarians in Okinawa, Japan, known for their longevity, give additional generalizability to previous findings.[2,10] This association has potentially important implications for early detection of cognitive impairment in older people.

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Sponsor's Role: None.

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COMMENTS/RESPONSES

GUIDELINES FOR NON-MEDICAL CARE PROVIDERS TO DETECT ILLNESSES IN ELDERLY EVACUEES AFTER THE 2011 EARTHQUAKE OFF THE PACIFIC COAST OF TOHOKU

To the Editor: On March 11, 2011, at 2:46 p.m. (JST), a strong earthquake occurred off the Pacific coast of Japan and hit the northeast part of the country. Devastating tsunamis followed that destroyed many coastal cities.[1] The magnitude of this quake according to the Japan Meteorological Agency was Mj9.0. A huge number of aftershocks continued after the quake, even now (May 6, 2011). According to the report by the National Police Agency of Japan, as of May 6, 2011, 14,841 people had died in this disaster, and 10,063 were still missing.[2] In addition, 109,086 homes were completely or partially destroyed, and 3,970 roads were disrupted.[2] As shown in Figure 1A, 119,967 displaced people (peak number approximately 470,000 on March 14, 2011) were still living in shelters supplied by the government as of May 6, 2011, because of disruption of community utility services and health risks of nuclear power plant accidents in Fukushima.[2,3] In particular, 37,482, 35,923, and 25,501 persons took refuge in the 357, 403, and 157 evacuation centers located in Iwate, Miyagi, and Fukushima prefectures, respectively.[2]

Drs. Shigeto Morimoto and Takashi Takahashi reported an outbreak of norovirus gastroenteritis in elderly evacuees after the 2007 Noto Peninsula earthquake in Japan.[4] There were 74 evacuees, including 61 elderly persons, in the shelter where the outbreak occurred.[4] Thirty-one evacuees with gastroenteritis, 29 of whom were aged 65 and older (mean age 76 ± 7), were examined and treated.[4] This experience suggests that elderly victims are more susceptible to disaster-related illnesses (i.e., infectious diseases, exacerbation of underlying illnesses, and mental stress) and disaster-related death. Therefore, a plan to establish guidelines to detect illnesses and perform triage rapidly in elderly evacuees was necessary. In April 2010, the six authors of the

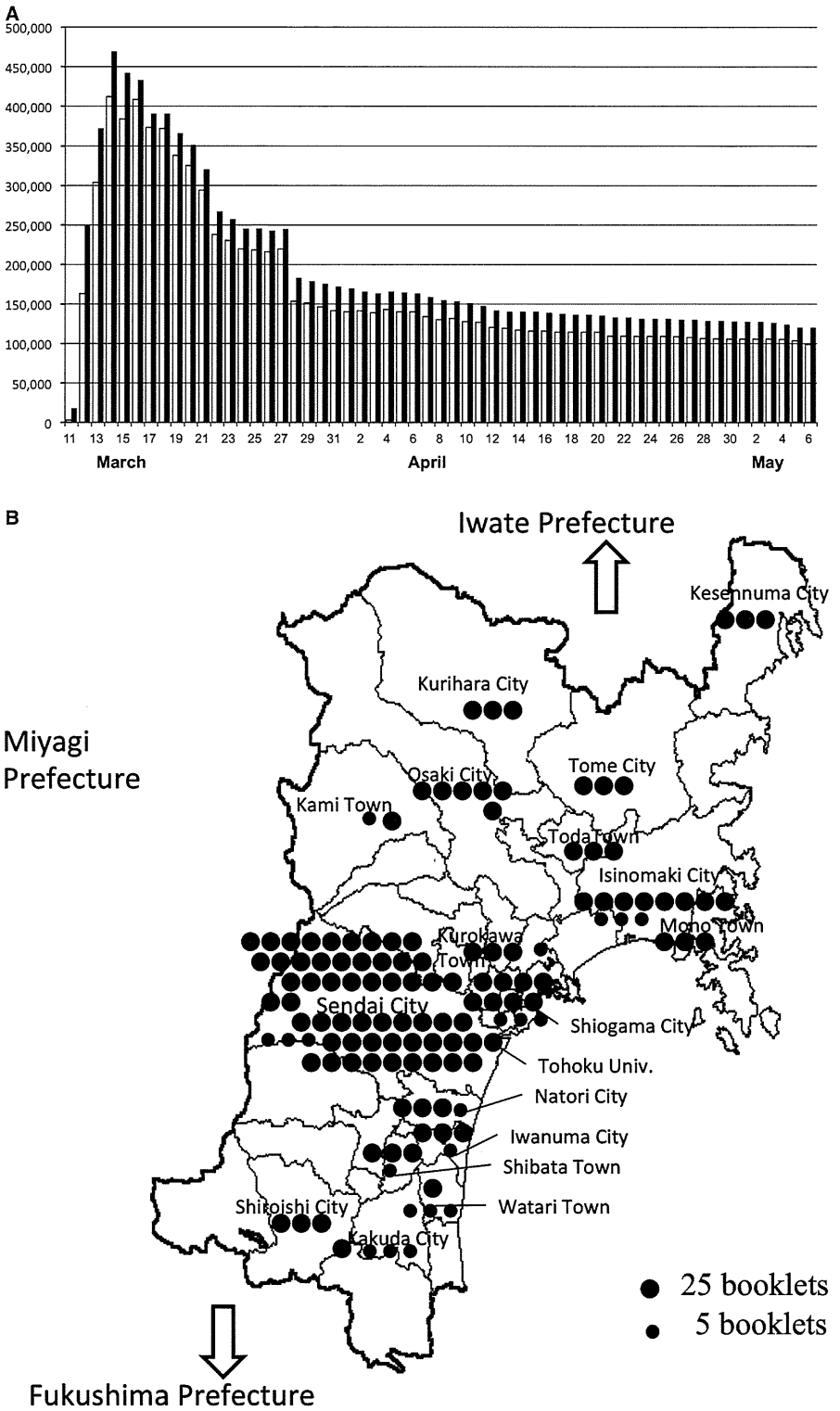

Figure 1. (A) Variations in number of evacuees from March 11 to May 6. Black and white bars denote total number of evacuees in Japan and number of persons still evacuated in Iwate, Miyagi, and Fukushima prefectures, respectively. (B) Distribution of guideline booklets to detect illnesses in elderly evacuees in Miyagi prefecture. These were distributed in the largest city, Sendai, where most people in this prefecture were living. Large and small closed circles indicate 25 and 5 booklets, respectively.

current letter formed the Study Group of "Guidelines Regarding the First Steps and Emergency Triage to Manage Elderly Evacuees" under a grant-in-aid for scientific research from the Ministry of Health, Labour, and Welfare of Japan.

Two types of guidelines were established: one for medical care providers (MCPs) and the other for non-MCPs (NMCPs, e.g., public health nurses and certified social workers). The guidelines for NMCPs seemed to be more effective

than those for MCPs, because there were limited MCP resources. The guidelines had three chapters: features of critical illnesses and prevention, acute symptoms, and chronic symptoms in elderly evacuees. For NMCPs to be able to understand the contents easily, it was written concisely.

One week after the 2011 earthquake off the Pacific coast of Tohoku, the guideline booklets were sent through members of the Japan Geriatrics Society (JGS) or the Japan Medical Association Team (JMAT) to NMCPs working in Iwate, Miyagi, and Fukushima. JGS and JMAT members were dispatched to these areas to care for evacuees. NMCP staff used the booklets to detect illnesses rapidly in elderly evacuees in shelters or homes. For example, the booklets were distributed in the largest city, Sendai, where most people in Miyagi were living (Figure 1B). The aim was to reduce morbidity and mortality from disaster-related illnesses in elderly evacuees. An investigation of the differences in morbidity and mortality between areas where the guidelines were and were not applied is planned.

The Japanese people had already experienced another strong quake, the Great Hanshin earthquake, which caused serious damage in the Kobe area on January 17, 1995. This disaster also hit the elderly population of an urban society particularly hard. More than half of the deaths were in those aged 60 and older, and in this age group, female mortality was almost double that of men.[5] Surviving older adults were largely left to their own devices and were marginalized in shelters. Elderly evacuees tended not to complain about their problems, so their suffering tended to be underestimated,[5] and it is therefore important for NMCPs to detect medical conditions quickly in elderly evacuees.

The situation of the recent disaster is different from that of the Great Hanshin quake in terms of the presence of tsunamis and nuclear power plant accidents. The recent quake's epicenter was located beneath the sea and caused huge tsunamis, whereas the Hanshin quake's epicenter was under the land and did not cause tsunamis. Most of the deaths were a result of the tsunamis this time, whereas the victims of the Hanshin quake were related to structure collapses and fires. Moreover, the recent evacuees in Fukushima are at short- and long-term health risks from the nuclear power plant accidents.[3] Therefore, a survey of the morbidity and mortality from disaster-related illnesses in elderly evacuees in Iwate, Miyagi, and Fukushima is needed.

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Author Contributions: Shigeto Morimoto and Takashi Takahashi: Study concept and design. Masafumi Kuzuya, Hideyuki Hattori, and Koichi Yokono: Acquisition of data. Katsuya Iijima and Shigeto Morimoto: Analysis and interpretation of the data. Takashi Takahashi and Shigeto Morimoto: Preparation of the letter.

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GAIT VELOCITY VERSUS THE TIMED UP AND GO TEST: WHICH ONE TO USE FOR THE PREDICTION OF FALLS AND OTHER ADVERSE HEALTH OUTCOMES IN PRIMARY CARE?

To the Editor: We read with great interest the recent article by Viccaro and colleagues in which they evaluated the predictive ability of the Timed Up and Go Test (TUG test) and gait velocity (GV) for falls and other adverse health outcomes.[1] Gait velocity predicted most geriatric outcomes, as did the TUG, and GV took less time to complete and demonstrated better prediction in individuals with intermediate (TUG = 12–15 seconds, GV = 0.6–1.0 m/s) and slow test performance (TUG < 12 seconds, GV < 0.6 m/s).

An important consideration when applying mobility measures across the spectrum of older people is the level

48:502

第53回日本老年医学会学術集会記録
〈パネルディスカッション4：高齢者災害時医療～避難所からいかに高齢者を守るか～〉

2. 災害時高齢者医療対策
3) 栄養面ならびにそれに関連する消化器疾患の対策と中長期管理

葛谷　雅文

Key words：災害，避難所，栄養，消化器疾患，備蓄

（日老医誌　2011；48：502-504）

はじめに

災害時に早い時期から栄養・食生活支援活動を進めることは，被災住民の心の安定はもとより，栄養状態の悪化を最小限に止め，より早く健康状態を回復させるなど，避難生活の健康保持のために重要である．特に高齢者は予備能が少なく，数日の栄養摂取不良により，容易に健康障害に至る．栄養状態と深い関連がある消化管疾患と合わせて，被災時における栄養・食生活に関する問題点につき考える．

災害後の消化器疾患

阪神淡路大震災後に消化性潰瘍が多発し，しかも高齢者における出血性潰瘍が多発したことが，多くの関西地域の医療機関から報告された[1]．今回東日本の震災後，同様に消化性潰瘍が増加したか否かの報告はまだなく，今後の検証が待たれる．

また，被災地，特に避難所にいる高齢者では便秘が多発することが知られる．種々の原因があるが，特に繊維の少ない食事，水分摂取の減少，排便する環境などが係わっているものと思われる．また，ノロウイルスによる感染性下痢などが能登半島地震後に報告されており[2]，集団生活における感染性下痢症に関しては最大限の注意が喚起されている．

栄養に関連する事項

被災地において栄養の問題は急性期（災害発生後3日目まで）～亜急性期（以降2週間程度），慢性期まで継続的に係わっている（表1）．

急性期までの問題は食料の確保である．阪神・淡路大震災での食料の配給状況を調査した報告をみると，発生から3日目午前まで「1日におにぎり1個」などの少量の食物か，まったく配給されなかった避難所もあり，ほとんどの被災地で食料が非常に不足した．しかし，3日目午後から3食の食料が規則的に配給されるようになり4日目から農水省，自衛隊，県警などによる食料供給体制が整い，5日目頃から被災者自身による食料確保（購入）やボランティアによる炊き出しが行われ，ようやく食料援助に関して安心感がもたれるようになった，との報告がある．一方で，阪神・淡路大震災では，食料の必要供給数の把握が困難であったことに加え，被災地域外からの支援の受入体制が十分ではなかったため，避難者全員に食料が行き届かない等の問題が生じた．また，避難所によっては輸送ルートからはずれ，なかなか食料が届かなかったり，高齢者等が冷えたおにぎりや弁当で体調を崩すなどの問題も指摘された，との報告があり[3]，被災地域による相違がかなりあったようだ．

いずれにしろ，今までの多くの被災の現場からの報告

表1　特に重要な災害と関連する消化管疾患と栄養問題

消化性潰瘍
便秘：食事の影響，環境，水分量
下痢：感染性（ノロウイルス），非感染性
栄養に関する問題：
急性期：カロリー不足
亜急性期～慢性期：
タンパク質，食物繊維，ビタミン不足
病態に不適切な食事（糖尿病，腎不全，高血圧など）
急性～慢性期：限られた食形態
食事摂取が自立していない高齢者：介護力，経腸栄養剤（濃厚流動食）の備蓄の問題

Nutrition and related gastroenterology disorders among elderly evacuees
M. Kuzuya：名古屋大学大学院医学系研究科地域在宅医療学・老年科学

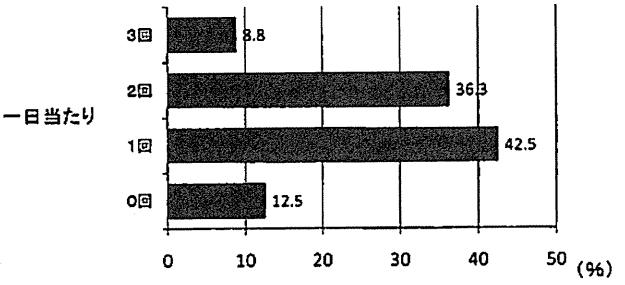

図1　東日本大震災一カ月後の一日の副食の回数（宮城県内230カ所の避難所で出された副食回数：4月11日～17日）
NPO団体などが4月11～17日に宮城県内の避難所230カ所を調査したところ，野菜や肉，魚などを調理した副食が1日平均1回以下のところが55%あり，12.5%はゼロだった．（読売新聞：4月25日）

より，災害発生後3日間は自前の食料と水で対応できるだけの備蓄をすることが必要であり，病院，介護施設などでも3日程度の非常食の備蓄が勧められている．しかし，今回の東日本の大震災ではNPO団体などが被災後約一カ月経過した4月11～17日に宮城県内の避難所230カ所を調査したところ，野菜や肉，魚などを調理した副食が1日平均1回以下のところが55%あり，12.5%はゼロだった（読売新聞：4月25日）(図1)[4]．今回は津波による極めて広域な地域が被災に遭遇しており，周辺地域からのネットワーク機能が十分に発揮されなかったことによるものと思われる．

亜急性期～それ以降においては，カロリーの問題以外に長期間続く避難食特有な画一的，偏った食事内容に関連する問題が出現する．特に非常食は主に炭水化物が主体となっており，タンパク質，繊維成分，ビタミンを含む微量栄養素の不足が危惧される．さらに糖尿病，腎不全，高血圧症など食事療法が必要な集団に対する適切な食事の供給が難しい．さらに，被災地で適切にそのような患者に食事指導ができる行政栄養士が配置できていない，などの問題もある．

また，今回の震災後にも問題になっていた，人工栄養療法に依存している対象者に対する栄養剤の備蓄が不十分であり，緊急に周辺地域からの供給が切迫したことも問題視したい．特に今回のような原発事故などが重なり，被災地に入ることが制限されたことも大きかった．経口摂取はできるが，摂取時に時間をかけた介護が必要な集団が介護施設のみならず在宅においても相当数存在するはずである．介護者，介護スタッフ自体も被災した状況において介護機能が十分機能したかどうか，今後検証されなければならない問題である．

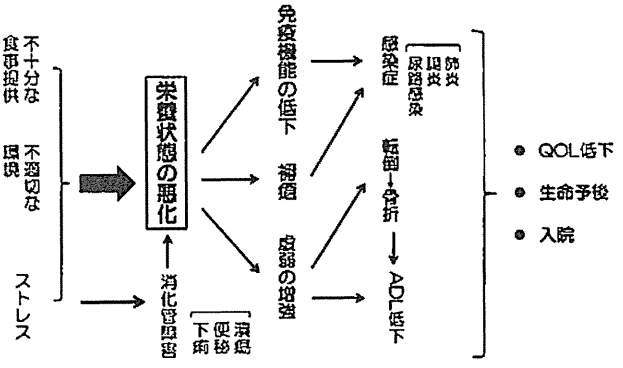

図2　被災地における高齢者の栄養障害による悪循環

栄養に関する準備について

阪神・淡路大震災後，災害時の栄養・食事関連マニュアルが複数排出されている．さらに，いくつかの自治体も独自に災害時の栄養・食生活支援マニュアルを公表している[5]．しかし，いくらマニュアルやガイドラインができても，その計画通りに災害に対して準備が実施できているかが重要である．尾崎らは厚生労働省科学研究費補助金を受け，全国の1,727市町村の栄養業務担当者を対象としたアンケートを実施している[6]．それによると，市町村防災計画に被災者に対する保健指導や栄養・食生活支援活動の進め方が示されていると回答した市町村は半数未満であった．実際に，災害時の栄養・食生活支援に関する研修会の開催やマニュアル・ガイドラインの提供などの技術的支援を保健所から受けていると回答した者の割合は，3割未満であった．行政として備蓄する水や食料の具体的な品目や備蓄量について示されていると回答した市町村は44%であった．しかし，記載されている品目や備蓄量を実際の備蓄が満たしている自治体は，50%前後に過ぎなかった．行政は，在宅療養支援診療所や訪問看護ステーションなどの地域の医療機関と連携しながら，災害時要援護者支援を検討していく必要があるが，実際には災害時要援護者に特化した指導や助言はほとんどおこなわれていなかった．

さいごに

災害時には，様々な理由で生活機能弱者である高齢者には栄養状態の維持には不利な状況が起こる．高齢者に一度栄養障害が発生すれば，感染症をはじめとする様々な疾患を誘発し，生活の質さらには日常生活動作障害にまで連続的につながる可能性がある（図2）．災害には遭わないほうがよいが，今回の東日本で起こったような災害は災害大国である日本ではいつでも，どこでも起こ

りうると考えながら，細心の注意を払いながら準備をするべきである．自分たちの生活している地域の行政がどのような取り組みをしているかも，各個人個人で調べておいたほうがよさそうである．

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Geriatrics Gerontology INTERNATIONAL 1st Impact Factor in June 2010 Medline Indexed

Geriatr Gerontol Int 2011; **11:** *383–394*

COMMISSION REPORT

Guidelines for non-medical care providers to manage the first steps of emergency triage of elderly evacuees

Takashi Takahashi,[1] Katsuya Iijima,[2] Masafumi Kuzuya,[3] Hideyuki Hattori,[4] Koichi Yokono[5] and Shigeto Morimoto[6]

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On 11 March 2011, a strong earthquake occurred off of Japan's Pacific coast and hit northeastern Japan. The earthquake was followed by huge tsunamis, which destroyed many coastal cities. As a result, the Study Group on Guidelines for the First Steps and Emergency Triage to Manage Elderly Evacuees quickly established guidelines enabling non-medical care providers (e.g. volunteer, helpers, and family members taking care of elderly relatives), public health nurses, or certified social workers to rapidly detect illnesses in elderly evacuees, and 20 000 booklets were distributed to care providers in Iwate, Miyagi, and Fukushima prefectures. The aim of this publication is to reduce susceptibility to disaster-related illnesses (i.e. infectious diseases, exacerbation of underlying illnesses, and mental stress) and deaths in elderly evacuees. **Geriatr Gerontol Int 2011; 11: 383–394.**

Keywords: earthquake, elderly evacuee, emergency triage, guidelines, non-medical care provider.

Background

Japanese people have already experienced a variety of natural disasters including earthquakes,[1] typhoons,[2] tsunamis,[3] and others. It is very important to manage the medical care of elderly evacuees in the wake of disasters because: (i) elderly subjects (especially those needing to live in shelters) may suffer excessive mental and/or physical stress under the altered environment; and (ii) it is difficult to maintain medical management of chronic illnesses (e.g. hypertension, diabetes mellitus, cerebrovascular or cardiac disease) when care has already been started at local medical institutions. It was reported that acute risk factors possibly triggered cardiovascular events in hypertensive elderly patients after the Hanshin-Awaji earthquake.[4] Increased incidence of transient left ventricular apical ballooning (takotsubo cardiomyopathy) was also described after the Mid Niigata Prefecture Earthquake of 2004.[5]

In April 2010, the Study Group on "Guidelines for the First Steps and Emergency Triage to Manage Elderly

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Authors' contributions: Shigeto Morimoto and Takashi Takahashi contributed to the study concept and design. Masafumi Kuzuya, Hideyuki Hattori, and Koichi Yokono performed acquisition of data. Katsuya Iijima and Shigeto Morimoto analyzed and interpreted the data. Takashi Takahashi and Shigeto Morimoto prepared the manuscript.

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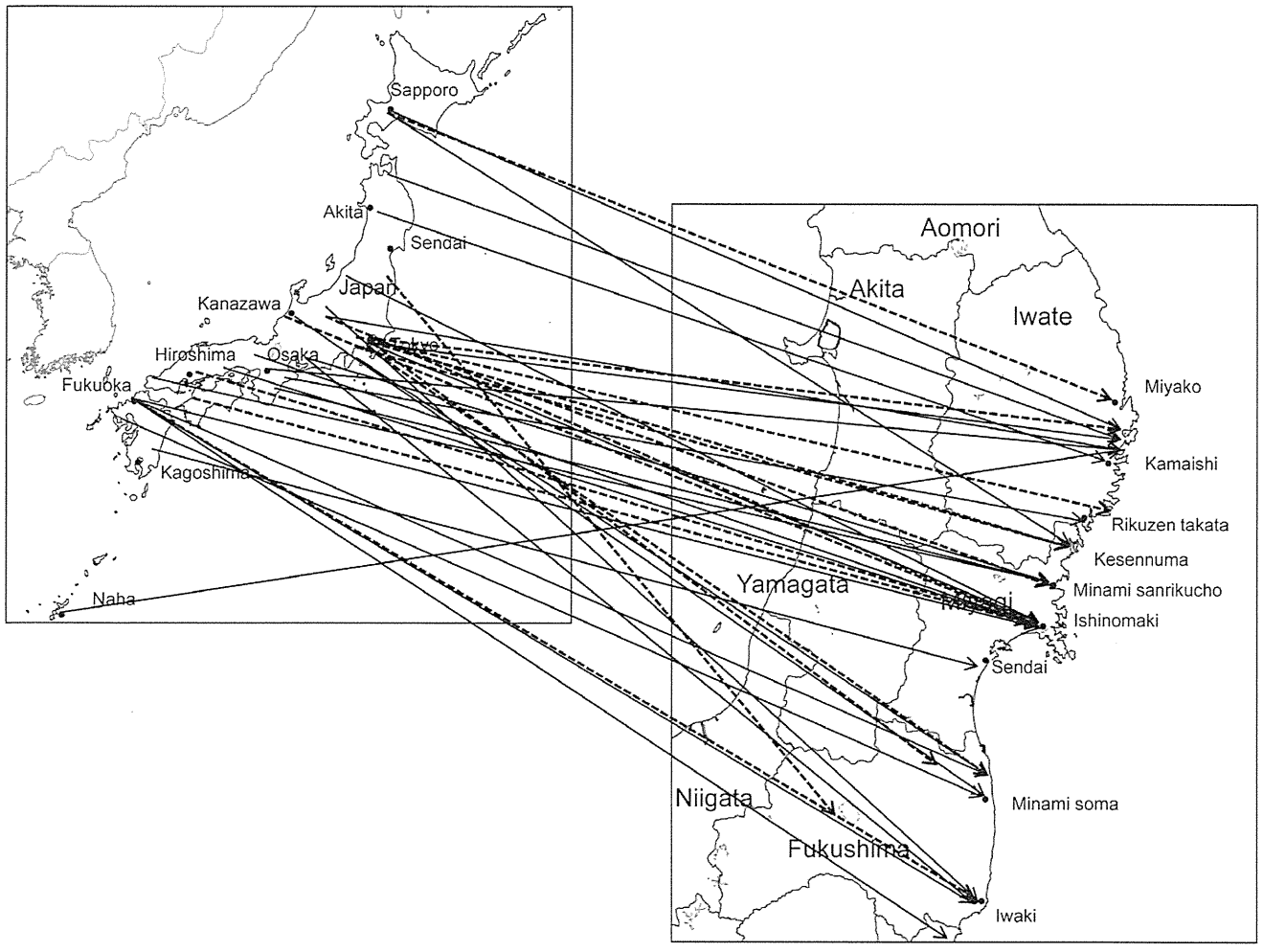

Figure 1 One week after the 2011 Tohoku earthquake, 20 000 booklets for non-medical care providers were distributed by members of the Japan Geriatrics Society (dotted lines) and Japan Medical Association Team (straight lines), to evacuation centers located in Iwate, Miyagi, and Fukushima prefectures.

Evacuees" was formed, with funding from Japan's Ministry of Health, Labour and Welfare, to conduct comprehensive research on aging and health. The study group aimed to complete and revise the guidelines based on external reviews by expert medical doctors by March 2012.

By collaborating with the Japan Geriatrics Society after the 2011 earthquake off the Pacific coast of Tohoku, we have quickly published two tentative guidelines to manage elderly evacuees: one for medical care providers and another for non-medical care providers (NMCP), including volunteer, helpers, and family members who are taking care of the elderly, public health nurses (PHN), or certified social workers (CSW). A total of 20 000 guideline booklets have been distributed by members of the Japan Geriatrics Society and the Japan Medical Association Team to NMCP, PHN, or CSW working in Iwate, Miyagi, and Fukushima prefectures (Fig. 1). The Japan Medical Association Team's mission is to provide medical assistance at hospitals or clinics in disaster-affected areas and to provide ongoing medical treatment that was started before the disaster.[6]

Preface

The guidelines for NMCP, PHN, and CSW have three chapters: (i) Features and prevention of critical diseases in elderly in evacuation areas; (ii) Signs of acute diseases in elderly; and (iii) Symptoms of anxiety in elderly in shelters. Ideally, NMCP, PHN, or CSW will use the booklets to rapidly detect illnesses in the elderly in shelters or homes. NMCP, PHN, or CSW should immediately inform attending medical staff when those with the signs or symptoms are detected.

Guidelines

I. Features and prevention of critical diseases in elderly in evacuation areas

1–1). Heart attack. This condition includes angina pectoris, myocardial infarction, and other illnesses due to myocardial ischemia, a lack of blood flow in arteries.

Signs and symptoms of a heart attack

Location of symptoms	Central chest to left side of chest
	Apart from chest discomfort, anginal pain in the upper central abdomen, back, neck, jaw, or shoulders
Detailed symptoms	Worsening ("crescendo") chest pain, specifically crushing, burning, or choking sensation
	Onset of severe oppression or worsening oppression
Duration of symptoms	Infrequent or lasting less than 10 min
	Lasting more than 15 min, suggesting unstable condition

Note: Caution is needed because silent or mild symptoms frequently occur in the elderly, especially in those with diabetes. In addition, elderly people sometimes present with atypical symptoms, including breathlessness, nausea, discomfort in the upper central abdomen, or burping.

Measures to prevent heart attack in shelters

- NMCP, PHN, or CSW should be aware of elderly who normally take medication for cardiac disease and/or hypertension.
- NMCP, PHN, or CSW should check on the elderly.
- NMCP, PHN, or CSW should ensure that the elderly drink plenty of fluid, including water, to prevent dehydration. They should also advise that the elderly consume a low-salt diet and not smoke.
- If the elderly have any of the above symptoms, medical staff should be alerted.

Tips to treat cardiopulmonary arrest in shelters

- NMCP, PHN, or CSW should perform CPR, pushing the central chest strongly and quickly (100 times per minute) and alert medical staff immediately.

1–2). Hypertension. Awareness of blood pressure (BP) and its variability in the elderly is necessary because they may have excessive mental and/or physical stress, especially if in an emergency evacuation area or first-aid station, relative to their day-to-day lives before the disaster.

Measures to deal with elderly receiving antihypertensive drugs

- First, elderly people who are usually prescribed antihypertensive drugs should be reported to medical staff. NMCP, PHN, or CSW should check on the elderly.
- Elderly people who have been diagnosed as hypertensive should also be checked by medical staff, NMCP, PHN, or CSW.
- BP should be measured frequently. If possible, it is better to measure it daily using an automatic BP machine. In high-risk patients, it is recommended that BP be measured in both the morning and evening.
- If the elderly person's medication is not known because the prescription record is lost, a doctor or medical staff should be consulted.
- If an elderly person has a headache, palpitations, chest symptoms, and/or flushing, BP should be measured immediately and medical staff consulted.
- No smoking and a low-salt diet are also recommended. Endeavors must be made to ensure the elderly maintain physical activity (e.g. any exercise for at least 30 minutes a day).

2. Stroke/cerebrovascular disease (CVD)

Cerebrovascular accidents occur suddenly due to a disturbance in the blood supply to the brain and lead to a loss of cerebral function.

Signs and symptoms of stroke/CVD

If elderly people have any of the following symptoms, it is possible that they may have suffered a stroke/CVD. Consult medical staff immediately, because these situations may become medical emergencies.

- Symptoms starting suddenly and lasting from a few seconds to minutes
- Headache (mild to severe)
- Vertigo and/or dizziness (with nausea/vomiting on occasion)
- Disturbance of consciousness (snoring-like breathing, semiconscious state/coma)
- Motor disturbance including hemiparesis/hemiplegia/numbness, exhaustion, muscle weakness of the face (central facial palsy), drooling from one corner of the mouth, eyelid drooping (ptosis)
- Aphasia (difficulty with verbal expression, auditory comprehension)
- Sensory or vibratory disturbance (on one side)
- Visual field defect/hemianopia, double vision/polyopia
- Loss of balance when sitting, standing, or walking; loss of coordination.

Measures to prevent stroke/CVD in shelters

- First, medical staff and people around should be aware of elderly people who usually take medication for atherosclerotic diseases and/or lifestyle-related diseases (e.g. hypertension, diabetes, dyslipidemia, and cardiac diseases including atrial fibrillation).
- Also, people around should check on the elderly.

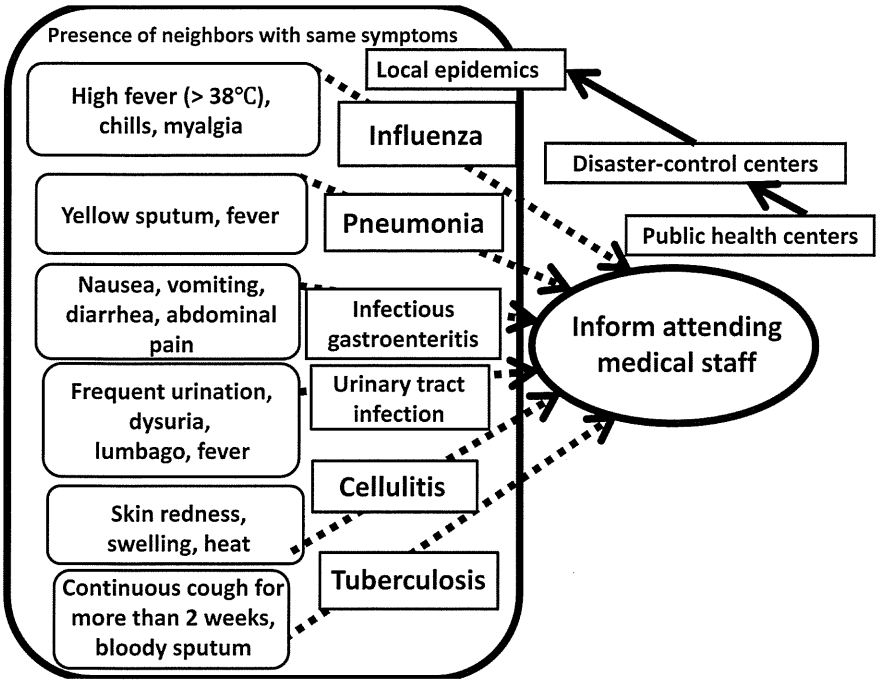

Figure 2 Measures to rapidly detect infectious diseases.

- Continue usual drugs including anticoagulation drugs if possible.
- In cases of unidentified medical conditions because of loss of an elderly person's prescription record, medical staff should be consulted.
- Anticoagulation drugs are generally essential. However, it is better to consult medical staff because it is necessary to check for external wounds or bleeding from the gastrointestinal tract, including stress-induced ulcer.
- CVD is strongly associated with hypertension. Measure BP regularly.
- No smoking is strongly recommended.
- Drink any fluid, including a lot of water, to prevent dehydration.
- A low-salt diet is strongly recommended. Endeavor to take dietary fiber in vegetables including seaweed and mushrooms.
- Endeavor to do any type of exercise or walk for at least 30 minutes a day regularly.
- Prevent constipation.
- Be careful about changes in temperature, especially in winter.

3. Infectious diseases

Signs and symptoms of infectious diseases

It is useful to have information on epidemics of infectious diseases in stricken areas before and after disasters, in order to quickly detect illness. In particular, this measure is beneficial for diseases, such as influenza, food poisoning and viral gastroenteritis, with a short incubation time from infection to the onset of symptoms (i.e. several hours up to 3 days). Pay special attention to elderly persons with these symptoms and immediately inform medical staff if there is suspicion that an elderly person has such an illness. In relation to this point, it is important to collect epidemiological information from district public health centers through disaster-control centers (Fig. 2).

In fact, many evacuees in shelters developed vomiting and diarrhea after the 2007 Noto Peninsula Earthquake. It was possible to immediately predict an outbreak of norovirus gastroenteritis among evacuees since a local epidemic of this infectious disease had already been observed in the Noto area before the quake.

However, local epidemics are not always useful for detecting infectious diseases, particularly those with a long incubation period (i.e. several months up to 2 years) such as pulmonary tuberculosis.

Measures to prevent transmission of infectious agents in shelters

- The environment in shelters induces an increased risk for outbreaks of infectious diseases because many evacuees are living together in a very limited space.
- It is very important to wash hands and gargle as standard precautions. Please apply hand disinfectant when it is not possible to use water. It is essential to wash hands or use hand disinfectant after using the toilet.
- NMCP, PHN, or CSW should not directly touch human bodily fluids (e.g. blood, urine, feces, nasal discharge, and sputum) with their hands because the fluids may include infectious microorganisms.

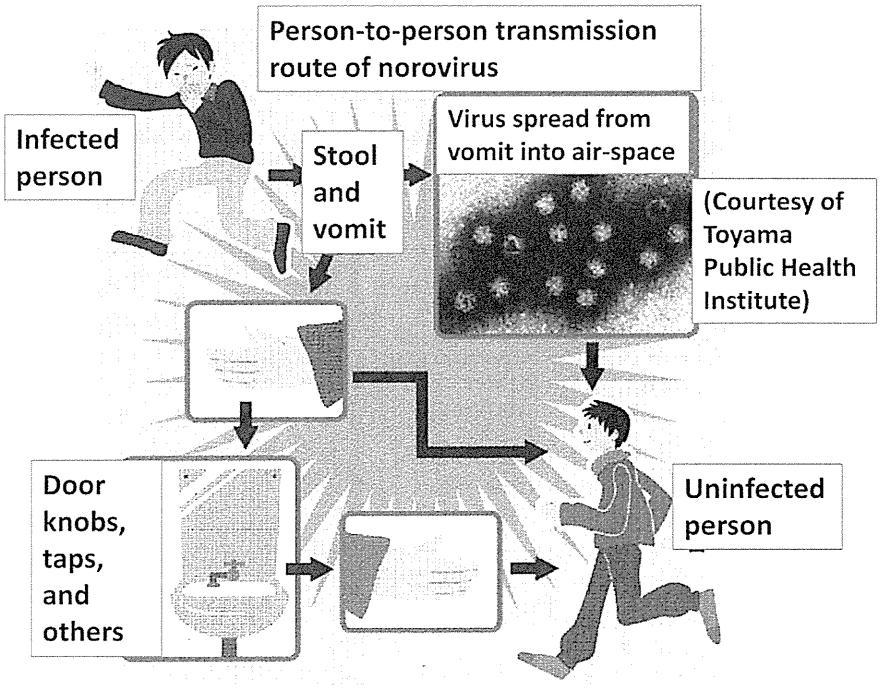

Figure 3 Person-to-person transmission route of norovirus.

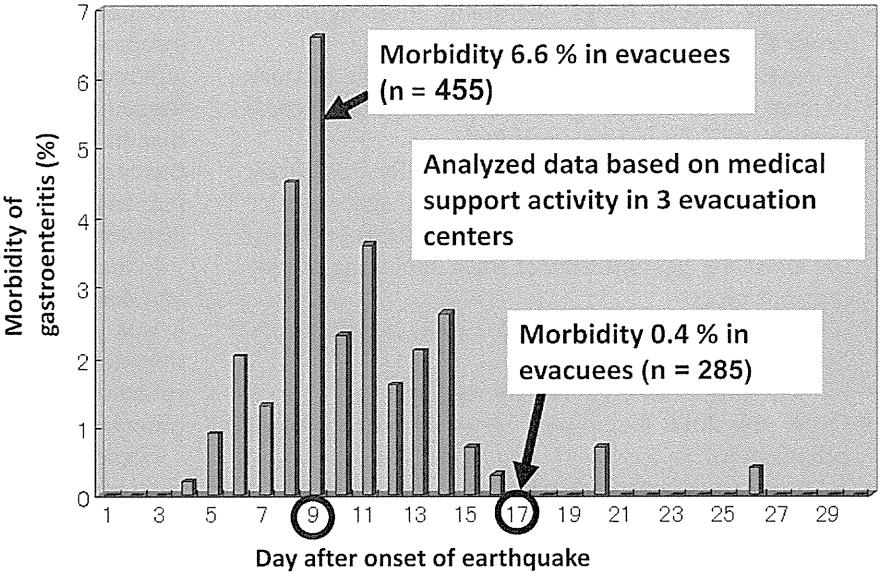

Figure 4 Morbidity of gastroenteritis in evacuees in shelters after the 2007 Noto Peninsula Earthquake.

If NMCP, PHN, or CSW are aware that the environment (floors in shelters, portable toilets, and temporary water-suppliers) has been contaminated with vomitus or diarrheal matter, contact medical staff. Do not clean the contaminated environment yourself. The staff can deal with this using 0.1% sodium hypochlorite disinfectant.

- Norovirus can spread via person-to-person transmission and lead to gastroenteritis outbreaks (Fig. 3).[7] However, it is unnecessary to isolate subjects with gastroenteritis from the stricken areas. The outbreak in shelters after the Noto quake was quelled after one week of interventions including personal hand hygiene, gargling, and the use of disinfectant on environmental surfaces (Fig. 4).[8]

In addition, respiratory hygiene (cough etiquette) is recommended to prevent respiratory infections.[9] With respect to coughing, rhinorrhea, sneezing, and sputum, please instruct evacuees to behave as follows: (i) use a tissue to cover your mouth and nose when you cough or sneeze (Fig. 5); (ii) drop used tissuew in a special waste basket; and (iii) wash your hands with soap and warm