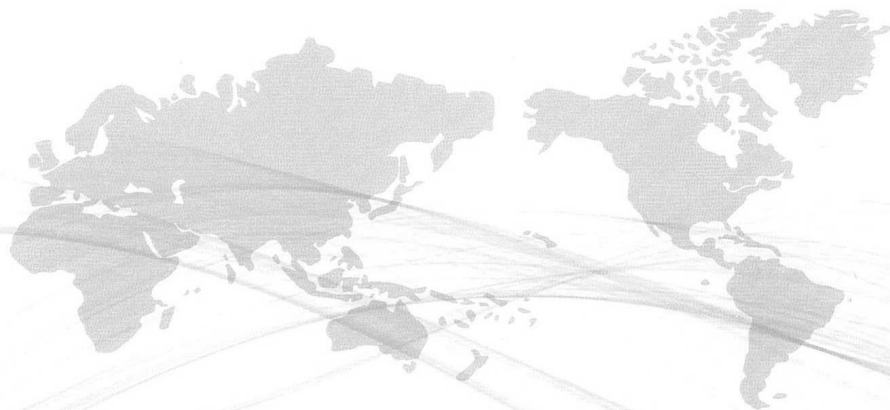


2015

Korea, Japan and Taiwan Tripartite Network Meeting on Medical Waste Mgt and Policy

October 20, 2015



Korea Environment Corporation

2015 Tripartite Network Meeting Schedule



October 20, 2015

09:30 – 10:00	Registration	
10:00 – 10:10	Opening Ceremony	
10:00 – 10:10	Welcome and Opening Remarks	Dr. Park, Eung-Ryeol, Executive Director, HQ of Resource Recirculation Management, Korea Environment Corporation(K eco)
10:10 – 12:10	Session 1 : Government Policy & Emergency Manual in Medical Waste Mgt Moderator : Dr. Lee, Seung-hoon, Korea Environment Corporation	
10:10 – 10:50	1-1. Emergency Mgt System of RMWs in MERS Event of South Korea	Dr. Kim, Wooil, Researcher, Dpt of Resource Recirculation Research, National Institute of Environmental Research
10:50 – 11:30	1-2. Present State of Medical Waste Mgt in Japan	Dr. Tanikawa, Noboru, Director, Research Division, Japan Industrial Waste Information Center
11:30 – 12:10	1-3. Bio-Medical Waste Mgt in Taiwan	Dr. Houg, Harvey, Advisor, Environmental Protection Administration Mr. Ku, Cheng-Chi, Associate Technical Specialist, Environmental Protection Administration
12:10 – 13:10	Luncheon	
13:10 – 15:40	Session 2 : Sharing Information and Cases of Effective Use of Medical and Industrial Waste Mgt System Moderator : Dr. Lee, Kyoung-Mu, Professor, Dpt of Environmental Health, Korea National Open University	
13:10 – 14:00	2-1. Management of Medical Waste in Korea	Dr. Lee, Kyoung-Mu, Professor, Dpt of Environmental Health, Korea National Open University, Korea
14:00 – 14:50	2-2. JW's Efforts for the Promotion of Appropriate Infectious Mgt in Japan	Ms. Sato, Akiko, Staff, Business Promotion Division, Japan Industrial Waste Information Center,
14:50 – 15:40	2-3. The Electronic Mgt of Waste in Taiwan	Ms. Ni, Ya-Hui, Deputy General Manager, Environmental Resource & Information Co., Ltd.
15:40 – 16:00	Coffee Break	
16:00 – 16:50	Session 3 : K eco Food Waste Mgt System Introduction & Demonstration Presenter : Mr. Choi, Seung-hwan, Manager, Korea Environment Corporation	
16:50 – 17:30	Discussion and Comments on the Issue	
17:30 – 17:40	Closing Remarks	
18:00 – 20:00	Banquet	

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Sharing Information and Cases of Effective Use of Medical and Industrial Waste Mgt System

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Session 1

Government Policy & Emergency Manual in Medical Waste Mgt

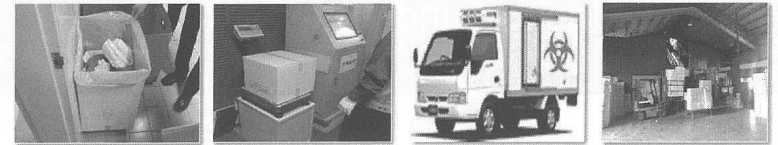
Session 1-1

**Emergency Mgt System of RMWs
in MERS Event of South Korea**

Dr. Kim, Wooil,
Researcher, Dpt of Resource Recirculation Research,
National Institute of Environmental Research

한·일·대만 네트워크회의 (20th Oct. 2015)

Emergency management system of RMWs in MERS event of South Korea



WOOIL KIM, woo1r@korea.kr
National Institute of Environmental Research



Overview of Presentation

- I Background and Overview
- II Treatment Scheme of Medical Waste
- III Action Plan of Medical Waste in Korea
- IV Summary on EMS of Korea



I. Background and Overview

MERS Event in South Korea

- **MERS** (Middle East Respiratory Syndrome)
- Outbreak occurred on May 20 2015
- **Current status** of MERS cases (Oct. 2)
 Laboratory-confirmed cases: 186
 Discharged: 145
 Deaths: 36
 Under treatment: 5* (Negative, being treated)
 Released from quarantine: 16693

MERS Event in South Korea

• Social and Economic Effects

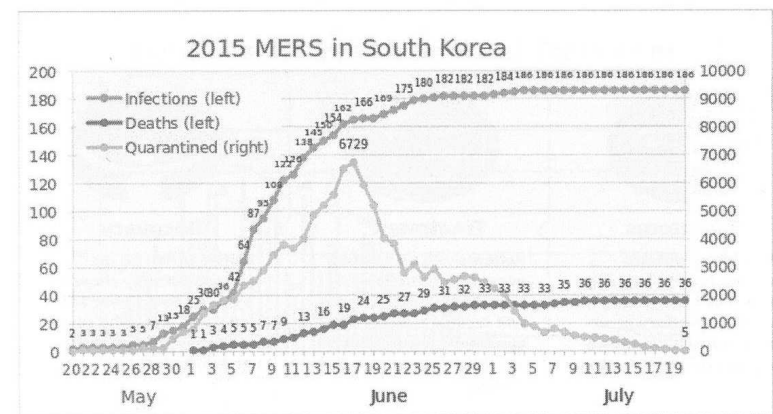
Education: Schools have been temporarily closed due to the outbreak

Economy: cut interest rates by 0.25 % to stem the economic fallout

Department store sales decreased by 16.5 % compared to the same period last year

Tourist visits to the nation had been canceled

2015 MERS Patients in South Korea



Prevention Guidelines against MERS

Middle East Respiratory Syndrome Coronavirus (MERS-CoV)

We can prevail if we work together.

MERS Prevention Guidelines

1 What is MERS?

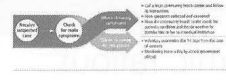
- MERS is a severe acute respiratory illness caused by a novel coronavirus.
- People infected with MERS-CoV show respiratory symptoms, including fever, coughing and shortness of breath, or gastro-intestinal symptoms, including nausea and diarrhea.
- The transmission of MERS-CoV usually declines when precautionary guidelines are appropriately followed.
- MERS is a viral disease. Healthy people will be able to recover from the disease with the help of modern medical technology and systems.

Call Centers to Report MERS Cases
Area Codes 120
109 Local Community Health Centers

1 Know it right and prevent it thoroughly

What if I contract MERS?

If you have ever visited any health facilities where MERS cases were reported, and suspect that you have been infected because of such symptoms as fever, coughing and shortness of breath, you should immediately work a doctor or hospital. But first call a community health center or neighborhood health center to be informed. If you have visited a clinic or hospital that has been reported to MERS, you may wish to report even if you develop no symptoms.



Disease prevention begins with basic hygiene practices, such as washing hands and taking extra care when coughing.

- Wash your hands frequently with soap and do not touch your eyes, nose and mouth with unwashed hands.
- Cover your mouth and nose when you cough or sneeze with a tissue or sleeve inside of your hand and avoid contact with other who have a high fever or bad cough.

How to Use Clinics for Diagnosis
Use neighborhood health facilities to report illness.
Before leaving using the emergency room or emergency center, if available, to receive the proper kind of care along with a health check-up.
When using a clinic, use a mask and stay away from the person who is sickly and nearby.

2 Concerted efforts are required

If under home quarantine

- Refuse from going out for 14 days from the date of contact.
- Use a separate room at home, and, if possible, use a private bathroom.
- Make sure to wear a mask when there are no visitors.
- Do not share daily supplies, including the dishes, cups, spoons, towels and bedding.
- Open windows frequently for ventilation.
- Make a call to a designated member immediately to report when you develop fever, coughing and shortness of breath.

If living with a person under home quarantine

- Find another temporary place to stay, unless you are the one who has to take care of the person under quarantine.
- Use a disposable mask and gloves when handling blood, body fluids, vomit, urine, saliva, nasal discharge, sweat, urine and excrement of a person under quarantine.
- Do not receive visits, guests and other people in your home.
- Clear table surfaces, handles, bathroom fixtures, sinks, beds, chairs, telephones, radios, PCs and other frequently touched surfaces with well appropriate cleaning tools (e.g. alcohol based).
- Monitor the health status of the person under quarantine and report accordingly.

For Inquiries About Emergency Facilities for Home under quarantine
Ministry of Health and Welfare Call Center 129

Recommended Measures to protect yourself



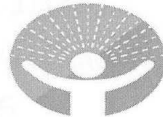
Symptoms

Possible symptoms include fever, coughing, difficulty breathing, other respiratory problems, nausea, vomiting and diarrhea.



Treatment

Patients will be treated according to their symptoms. Critical cases will receive specialized treatment, including use of a respirator and hemodialysis.

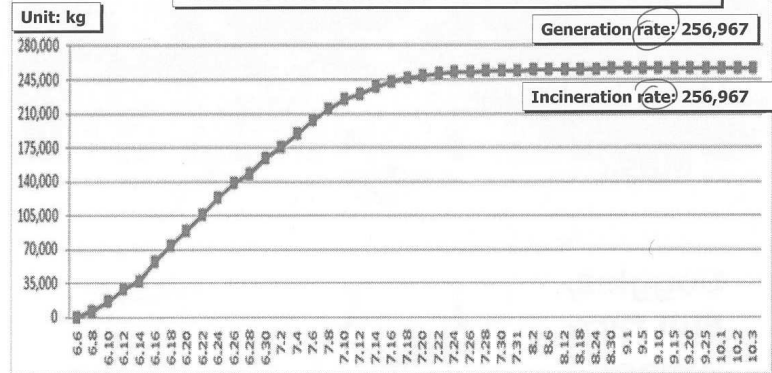


Recovery

Patients will be discharged if they show no symptoms or fever for over 48 hours and test negative for MERS two times, 24 hours apart.

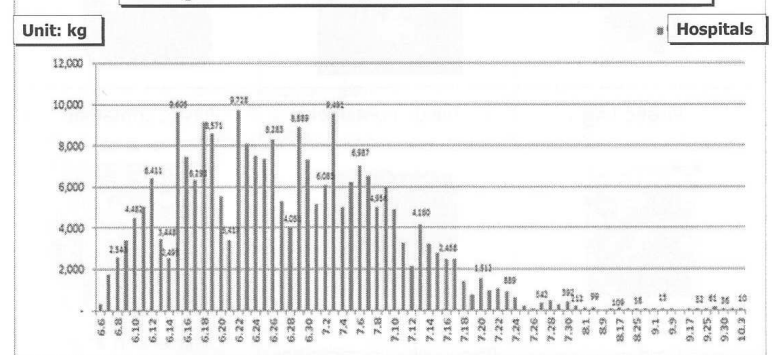
Accumulated Weight of Waste in MERS Event

Waste Generation and Accumulation



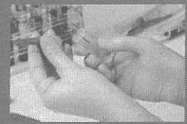


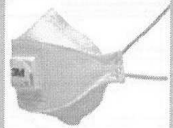


Daily Waste Generation and Treatment

Daily Waste Generation and Treatment






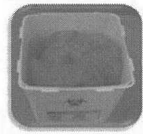
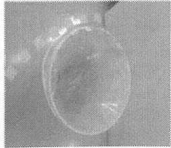


Personal Protective Equipment

Gloves, Gown		
Mask		
Goggles, Full face mask		

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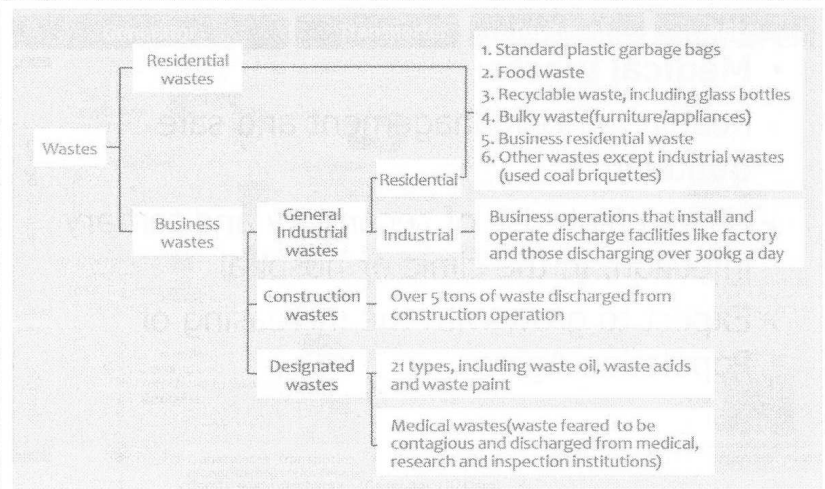
Regulated Medical Waste-only Containers

		
Plastic bag	Plastic container	Plastic container
		
Cardboard	Bag in plastic container	Disinfection after sealing of container

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II. Treatment Scheme of Medical Waste

Legal Classification of Wastes in Korea



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Regulated Medical Waste (RMW) in Korea

• **Medical waste:**

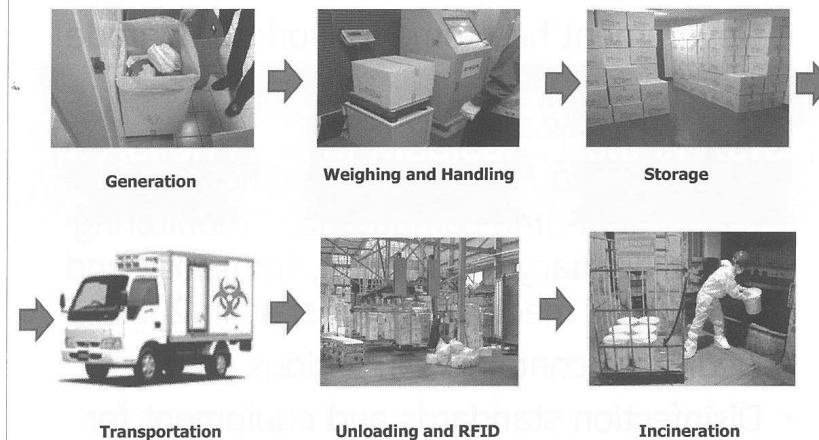
- Discharge from public health and medical institutions, veterinary clinics, testing and inspection institutions and other similar institutions. (Presidential Decree)
- Cause harm to human bodies by infection or otherwise
- Need to be specially controlled for public health and environmental conservation
- Ref. Waste Control Act

Regulated Medical Waste (RMW) in Korea

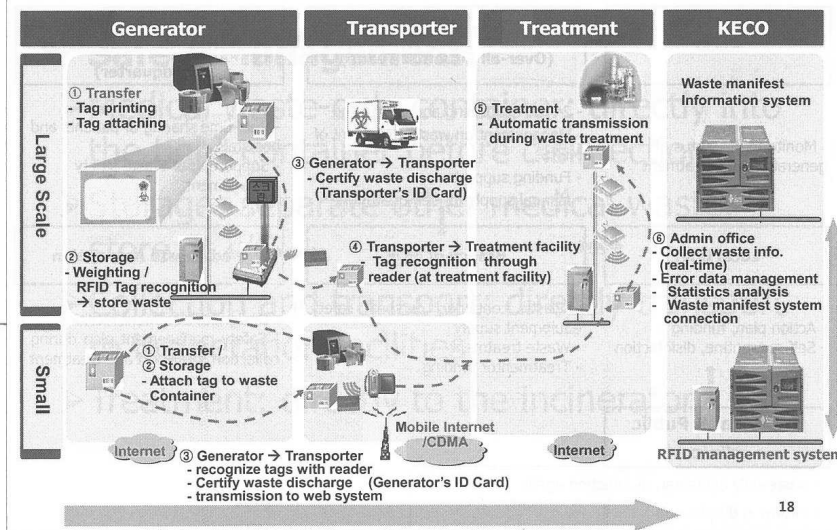
• **Medical waste:**

- Require strict management and safe treatment
- Have a high risk of secondary and tertiary infection, in the clinic or hospital
- Expect to grow with the increasing of Population Aging

Procedure of RMWs Management



Procedure of RMWs Management (RFID)

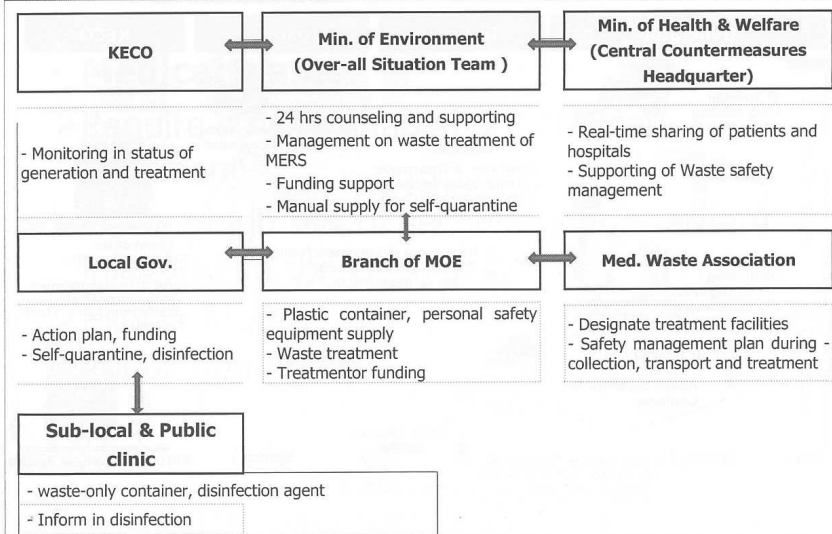


Improvemental Measures of Government

- Government has come to work to upgrade efficiency in the use of containers dedicated to medical waste
- **RFID** (Radio Frequency Identification) ensure real-time computerized monitoring of the discharge, collection, transport, and disposal of medical waste (start in 2008)
- Dedicated containers in various sizes
- Disinfection standards and equipment for vehicles

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Action System of Government against MERS



III. Action Plan of Medical Waste in Korea

Safety Management of RMWs in Hospitals

- **Safety Management:**
 - Medical waste-only container: directly into the tight-container before disinfection
 - Storage: separate other medical waste, store at 4°C
 - Collection and transport: directly transport to incineration facilities
 - Treatment: directly to the incinerator

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Management measures of Self-quarantine waste

- **Management measures of waste:**
 - Self-quarantine: supply to RMW-only container and disinfection agents (free)
 - Discharge and treatment: treat according to the Manual
 - without symptoms: after disinfection, Sealed RMW-only container and again put into a standard plastic bag. Treat as residential waste

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Management Measures of Self-quarantine Waste

- **Management measures of waste:**
 - With MERS or confirmed MERS: after disinfection, sealed RMW-only container and again put into a standard plastic bag. store as residential waste
 - Collection and treatment: contact to Local government. Immediately assign treatment facility and collect, transport, incinerate at the same day

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Safety Management of RMWs Treatment

- **Safety Management:**
 - Medical waste-only container: directly into the tight-container before disinfection
 - Storage: separate other medical waste, store at 4°C
 - Collection and transport: directly transport to incineration facilities
 - Treatment: directly to the incinerator

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Safety Measures for Related Persons

- **Safety Measures:**
 - Waste related persons: thoroughly use personal protective equipment without infection and transmission.
 - 119 Emergency medical service persons: treat medical waste when transport and emergency aid.
 - Prevent a car accidents: obey the safe driving, thoroughly disinfect the ambulance car

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IV. Summary on EMS of Korea

Summary

- **Regulated medical waste:** poses a potential risk of infection during handling and disposal
 - obey the Guidelines for infection control
 - use the personal protective equipment
 - to protect the workers who generate medical wastes and who manage the waste from point of generation to disposal

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Summary

- Safe transport and storage of on- and off-site regulated medical waste
 - health-care facilities are instructed to dispose medical wastes regularly to avoid accumulation
 - Medical wastes requiring storage should be kept in labeled, leak-proof, puncture-resistant containers under conditions that minimize or prevent foul odors

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Summary

- Storage area should be well ventilated and be inaccessible to pests
 - Appropriate treatment methods
 - On-site decontamination is preferred to reduce the potential of exposure during the handling of infectious material

30



Thank you !!!

Session 1-2

**Present State of Medical Waste
Mgt in Japan**

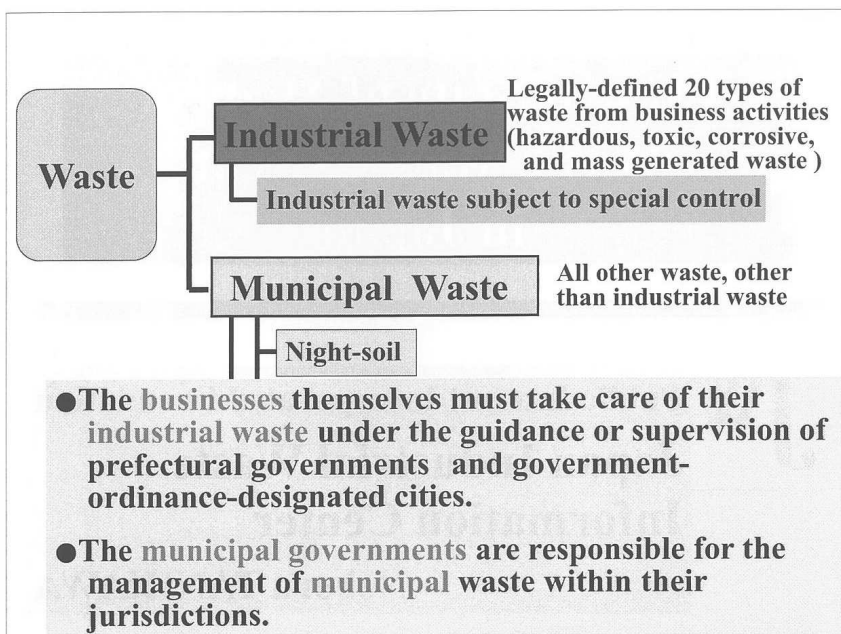
Dr. Tanikawa, Noboru,
Director, Research Division,
Japan Industrial Waste Information Center

Present State of Medical Waste Management in Japan

JW Public Interest Incorporated Foundation
Japan Industrial Waste Information Center
Noboru TANIKAWA

1. Definition of Waste in Japan





2. Classification of Industrial Waste in Japan

- | | | |
|---|---|--|
| <ul style="list-style-type: none"> • Cinder • Sludge • Waste oil • Waste acid • Waste alkali • Waste plastics • Waste rubber | <ul style="list-style-type: none"> • Waste metal • Waste glass, concrete and ceramic • Waste casting sand and slag • Bricks • Dust | <ul style="list-style-type: none"> • Waste paper • Waste wood • Waste textile • Animal and plant residues • Unwanted animal solid matter • Livestock excreta • Animal carcass • Waste generated by the treatment of above 19 industrial wastes |
|---|---|--|

Generation source : **All** Designated industry sector

3. Medical waste management in Japan

3.1 Definition

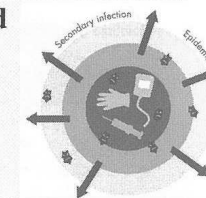
One kind of industrial waste and municipal waste

Infectious waste

One of industrial waste and municipal waste to special control

It may contain infectious pathogens and cause a risk of secondary infection or epidemics if being treated improperly.

For example, needle stick accidents, in which one hurts with used injection needle and contracts hepatitis, have occurred around the world.



Non-infectious waste

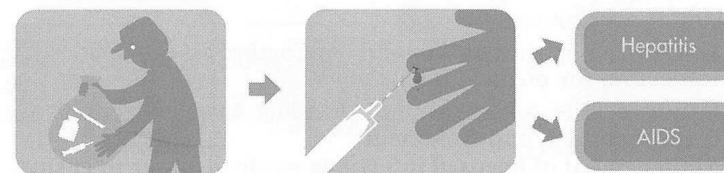
One of industrial waste and municipal waste

3.2 Proper Treatment of Medical Waste

For example, needle stick accidents, in which one hurts with used injection needle and contracts hepatitis, have occurred around the world.

Also, reuse of used injection needles is one of the major reason of spreading AIDS.

Therefore, infectious waste should be treated in safe and proper way.





3.3 Stakeholders for proper treatment of infectious waste



3.4 Main roles of stakeholders for proper treatment of infectious waste

(1) National Government

- Establishment of legal systems on the treatment of infectious waste
- Waste Management and Public Cleansing Law
 - ◆ Disposal Manual for Infectious Waste based on the Law to protect disposal workers from infections and promote proper disposal of infectious waste
 - Designation of infectious waste as subject to special control
 - Clarification of Responsibility of infectious waste generator
 - Clarification of proper infectious waste collection, transportation, and treatment methods

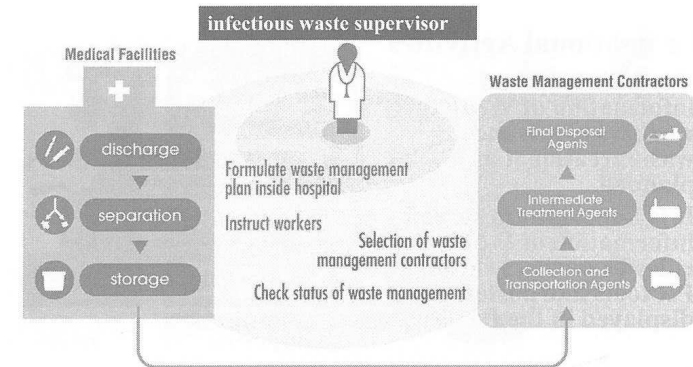
(2) Local Government

- Instruction, authorization and conduction on-the-spot inspection for medical institutions
- Grant of a license for proper infectious waste collection, transportation, and treatment
- Management of licensed infectious waste disposer to ensure proper treatment

(3) Medical Facilities (Doctors and Medical Institutions)

Responsibility as infectious waste generator

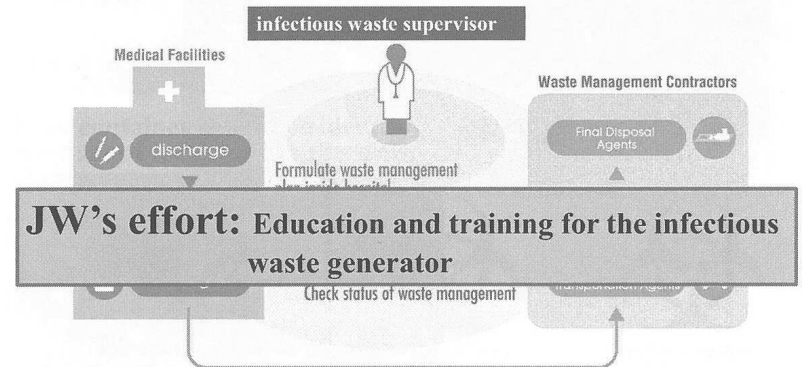
1) Staffing of the infectious waste supervisor
(He or she makes waste management plan (WMP) and instructs appropriate treatments to workers.)



(3) Medical Facilities (Doctors and Medical Institutions)

Responsibility as infectious waste generator

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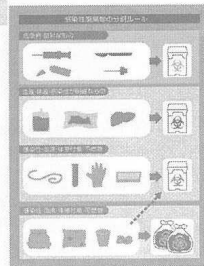


◆ Making Waste Management Plan

- WMP includes how to separate, store and dispose infectious wastes.
- WMP indicates emergency contacts.
- WMP should be revised once a year at least. It should fully reflect opinions from workers who engage infectious waste treatment in practice.

◆ Promotional Activities

- Supervisor spread information of WMP to workers to advance waste treatment as planned.
- It is important to spread information of WMP's rules to workers through PR tools like posters displayed in the facility.



Example of a poster for the rules for separating infectious waste



Example of an enlightening poster for the infectious waste's separation

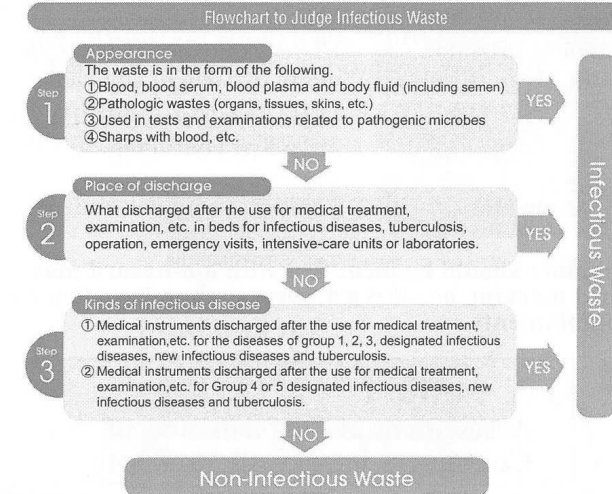
◆ Proper separation

Infectious waste should be separated from other waste at the point of generation.

Example of Infectious Waste's Separation

Infectious Waste (needles)	Infectious Waste (non-needles)	
	Non-burnable	Burnable
Non-infectious Waste		
Non-burnable	Burnable	

Example of judgement for proper separation



◆ Containers of infectious waste

Containers should be rigid and leak-resistant.

Characteristics	Type of container
Sharps such as injection needles and surgical knives	Rigid and leak-resistant container made by steel or plastics
Solid waste	Rigid, double-walled plastic bag or robust container
Liquid or sludged waste	Leak-resistant containers

Each container should be identified with bio-hazard marking. Bio-hazard marking has three different colors based on the nature of the containments.

Examples

Red marking for bloods or sludged infectious waste	Orange marking for solid waste	Yellow marking for sharps

◆ Containers of infectious waste

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Examples

JW's effort:
Assessment of Performance of Containers for Infectious Waste

Red marking for bloods or sludged infectious waste

Orange marking for solid waste

Yellow marking for sharps

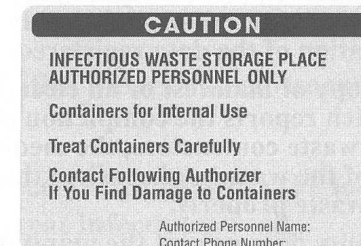
◆ Collection, Discharge and Storage

Collection

- When collecting infectious waste inside hospital, a worker uses special carts or carriages which are clearly specified as infectious waste and separated from other waste. The transportation route should be determined in advance so that it would be separated from other routes for meals and sterilized materials.
- One should pay special attention to transport containers storing sharps, such as syringe needles, among infectious waste, especially, those who has scar on a finger should protect hands by disposable rubber gloves and wear thick gloves.
- Furthermore, it is recommended to wash hands every time before and after the work, followed by sterilization of hands with antiseptic solutions such as alcohol.

Discharge and Storage

- To prevent accidents by infectious waste, storage place should be separated from other waste and not be accessible for the non-authorized.
- A signboard must be set up at the entrance to mark place for storage.



Example of signboard

2) Issue of manifest

- When a medical facility entrusts its infectious waste management to licensed waste management contractors, they needs to issue an industrial management slip(manifest) .
- Manifest is a written or electrical contract which specifies waste's consignee, quantity and type, forwarding with the waste from generators to final disposers. JW carries out the management and operation of the e-Manifest system and the preservation of the data registered.
- By receiving a copy of manifest or an electrical information which reports the completion of waste treatment from waste contractors, the medical facility can monitor status of the waste and confirm that the entrusted agents treat its waste properly.
- If a medical facility does not get the manifest to back, they should report to the local governments which monitor and instruct waste management contractors.

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3) Submission of a reports to local government

Form	Target medical facilities
Annual performance of issued manifest	All
Annual industrial waste management plan and their performance	Facilities which discharged over 50 tons of industrial waste subject to special control in the previous year

(4) Waste Management Contractors

Collection and Transportation

Safely transfer waste generated from medical facilities to waste treatment facility.

Intermediate Treatment

Detoxify infectious waste by combustion, detoxification etc.

Final Disposal

Landfill detoxified waste in an environmentally friendly way.

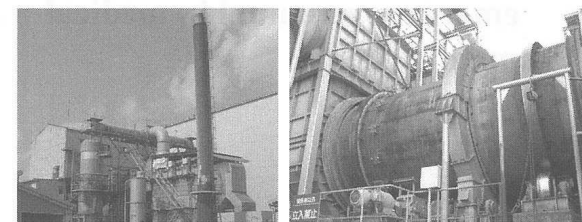
They have to receive license from the local government to collect and treat infectious waste.

JW's effort: Education and training for license

Treatment

On treating infectious waste, it is necessary to conduct the following methods to kill pathogen.

- Incineration
- Melting in a melting furnace
- Sterilization in an autoclave sterilizer
- Disinfection with heat
- Effective disinfection



Example of Treatment Facility