Status and Challenges of Medical Waste Management in Korea

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Classification of waste

I. Types and sources of medical waste

- Waste
  - Domestic waste
  - Industrial waste
    - General waste
    - Construction waste
      - Hazardous waste
      - Medical waste
1. Types and sources of medical waste

- **Tissues**: Extracted tissues/organs from human and animal, animals carcass etc.

- **Used cottons**: Swabs, gauze, bandage stained with blood, pus and excreta, used diaper etc.

- **Plastics**: Syringes, ringer’s solution set, blood bag etc.

- **Laboratory waste**: Tested/inspected culture and its vessels, waste-blood etc.

- **Sharps**: Needles, scalpels, blades, broken glass etc.

- **Mixed medical waste**: waste mixed with above type wastes
Sources of medical wastes

I. Types and sources of medical waste

- Hospitals and other public health-care centers
- Blood banks
- Animal quarantine station, pet clinic
- Laboratories and research centers which is related with medical / dental / oriental medical science
- Funeral parlors
- Prison, jail, mandatory facilities
- Nursing homes for the elderly
Generation status

**Generation**
- Increasing continually every year
- Majority of medical waste
  - Tissues (2.4%)
  - Plastics and other (97.6%)

**Sources (2004)**
- Total 51,921 facilities
- Majority sources
  - Hospitals (44,047)
  - Public health-care centers (2,971)
Treatment status (2004)

Treatment method

- Incineration 82.0%
- Sterilization-Pulverization 17.6%
- Reuse 0.4%

Treatment facilities

<table>
<thead>
<tr>
<th></th>
<th>Facilities</th>
<th>Disposal capacity (kg/hour)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incineration</td>
<td>15</td>
<td>14,020</td>
</tr>
<tr>
<td>Sterilization &amp; pulverization</td>
<td>5(4)</td>
<td>2,540</td>
</tr>
<tr>
<td>Total</td>
<td>16</td>
<td>16,560</td>
</tr>
</tbody>
</table>

※ Four sterilization and pulverization companies have incineration system
Deposit vessels

- Plastic type
- Corrugated cardboard type
  - Double sealing with transparent orange color plastic bag

Symbols color of deposit vessels

<table>
<thead>
<tr>
<th>Waste type</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human placenta (reusable)</td>
<td>Green</td>
</tr>
<tr>
<td>Human placenta (non-reusable), other tissues</td>
<td>Red</td>
</tr>
<tr>
<td>Cotton, plastics, mixed medical waste</td>
<td>Orange</td>
</tr>
<tr>
<td>Laboratory waste, sharps</td>
<td>Yellow</td>
</tr>
</tbody>
</table>

※ Statement on boxes: Generator, waste type, opening vessel date, collecting date, weight(kg)
Deposit method

Deposit permission period

- Generator
  - Less than 10 days, but small generators are less than 15 days
- Treatment company: 5 days

Deposit method

- Tissues: Deposit in freezer after put into deposit vessel
- Others: Store in warehouse after put into deposit vessel

Board of warehouse  Warehouse  Delivery vehicle
Treatment facilities

- Treatment facility condition
  - Incineration plant: bigger than 25kg/hr
    - Outlet of combustor temperature $\geq 850^\circ C$
    - Automatic input equipment and register
    - Treatment company’s incinerator $\geq 1$ ton/hr
  - Sterilization-pulverization plant: bigger than 100kg/hr

- Treatment method
  - Tissues and liquid type: Incineration
  - Others: Incineration or sterilization & pulverization
    - But, incinerate residue after sterilization & pulverization
  - Input waste without opening the deposit vessel
  - Register installation and waste automatic input equipment
Subdivision of classification

- Isolated-medical waste (Regulation reinforcement):
  → Medical waste from isolated ward

- Hazardous-medical waste (Maintain present regulation):
  → Tissues, laboratory, blood attached

- General-medical waste (Mitigate regulation)
Introduction of RFID system

Overview of RFID system

1. Tag Printing (Generator)
2. Storage (Generator)
3. Discharge (Generator)
4. Transporter receive
5. Storage (Treatment)
6. Incineration
Expected effect (Quantitative / Qualitative)

Quantitative effect

- Reduce costs
  - $13.6 million / year
  - Saved Costs
  - Present: Treatment facility (6.1 mil.)
  - Present: Transporter (5.0 mil.)
  - Present: Generator (2.2 mil.)
  - RFID Project
  - Y0

Tag requirement

- $18,300,000 / year
  - Applying RFID
  - Present: General hospital (10,152,000)
  - Present: Hospital (3,495,000)
  - Present: Decree of office (1,053,000)
  - RFID Project
  - Y0

Qualitative effect

The Administration

- Prevent environment contamination
  - illegal dump, prevent secondary contamination
- Efficient management for monitoring
- Help prompt decision from data
- Provide technical/institutional background for expanding RFID system and revitalization of market

System user

- Manual data input is unnecessary
  - shorten work time, exact data input
- Check expiring date
- Discharge reserve/confirm is not required
- Waste manifest (paper) is not required
Thank You