Digital Gov’t System for COVID-19 TREATMENT

Negative Pressure Isolation Room Information System

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The lecture will look at the Negative Pressure Isolation Room Information (NPIRI) system which was developed to promptly and efficiently allocate severe COVID-19 patients to the negative pressure rooms. This lecture will cover the system flow and how to use it as well as pre-requisite condition to develop the system.
Course Structure

1. Why We need NPIRI System for COVID-19?
2. NPIRI System Process
3. Main Function of NPIRI System
4. How to Report/Monitor the Operating Status
5. Summary
Course Objectives

To help you understand how the Negative Pressure Isolation Room Information System in Korea works

To learn detailed items on the operating status submitted by medical institutions and how they report such information, and how the health authorities monitor the status.
01 Why We need NPIRI System for COVID-19?

As COVID-19 spreads increasingly,

the government needed to identify nationwide status on the use of negative pressure isolation rooms which are vital equipment to treat the patients. To monitor the status, the government had to make a call, and it made the officials heavily overworked. As a result, HIRA developed NPIRIS for only two weeks for prompt and efficient allocation of hospital beds for patients with severe COVID-19.

※ What is a negative pressure room?
- It is a type of hospital room that separates a certain group of patients from other patients and provides them with medical treatments and it is considered as an essential method to stop the spread of infectious diseases.
- The negative pressure room has a special design: The air pressure inside the room is lower than the air pressure outside the room so that the air inside the room will not flow to the outside. Contaminated air is sucked out of the room with the filtration system that cleans the air to prevent the flow of the virus to the outside the room.
# 02 NPIRI System Process

## Requirements for operation and establishment of the system

1. **First**
   - Clearly defined roles of each entity including medical institutions and health authorities,

2. **Second**
   - Contact information of persons working for medical institutions in charge of the task for precise monitoring of the status, and

3. **Third**
   - ICT infrastructure that collects, processes, and manages the status of medical resources.

## Table

<table>
<thead>
<tr>
<th>Category</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Data</strong></td>
<td>Negative pressure isolation room status in healthcare institutions, status of patients, status of treatment equipment and medical personnel, information of person in charge of hospital ward allocation</td>
</tr>
<tr>
<td><strong>System</strong></td>
<td>Integrated medical healthcare resource report portal</td>
</tr>
</tbody>
</table>
Medical institutions submit the operating status of negative pressure rooms each day.

The health authorities monitor and use the status to allocate beds to patients with severe symptoms accordingly.
03 Main Function of NPIRI System

- Reporting on Negative Pressure Room Operating Status by Hospitals
- Real-time Monitoring of the Operating Status by the Health Authorities
# Main Function of NPIRI System

## Monitoring items regarding the operating status of negative pressure rooms

### Status of hospital beds

The total number of hospital beds with negative pressure equipment and number of available beds including negative pressure rooms in the intensive care unit, negative pressure rooms in the negative pressure isolation ward for patients in serious condition, negative pressure rooms for single patient, negative pressure rooms for multiple occupancy, isolated hospital beds without negative pressure.

### Status of COVID-19 patients administered to the hospital and their severity

No. of COVID-19 patients administered by severity (moderate, severe) and availability to administer such patients.

### Status of healthcare workers and medical equipment

- Available equipment (breathing machine, CRRT, ECMO)
- Available medical staff including infectious disease specialists, respiratory physicians, infection control nurses (including both advanced practice registered nurse and practice nurse)

### Status of persons in charge

Persons in charge of reporting during weekdays, weekends, and holidays, contact information of persons responsible for hospitalization and bed allocation.

※ Monitoring target entities: 97 healthcare centers providing medical treatments to patients in serious condition.
04 How to Report and Monitor the Operating Status

Access to HIRA medical resource report portal (http://www.hurb.or.kr)

Access allowed to medical institutions for patients in critical condition and health authorities only

1 Medical institutions
COVID-19 reporting ➔ Report on the status of COVID-19 medical resources

2 Health authorities
My page ➔ COVID-19 medical resources monitoring
# 04 How to Report and Monitor the Operating Status

## How healthcare institutions treating patients in critical condition report their operating status of negative pressure rooms

<table>
<thead>
<tr>
<th>Base Date</th>
<th>Healthcare Institution ID no.</th>
<th>Healthcare Institution Name</th>
<th>Region</th>
<th>State-designated hospital (Y/N)</th>
<th>State-Public designated hospital (Y/N)</th>
<th>Reporting Date</th>
<th>Submission (Y/N)</th>
<th>Submitted data</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020-06-24</td>
<td>111100028</td>
<td>기울릭대학교 여의도성모병원</td>
<td>서울</td>
<td>N</td>
<td>N</td>
<td>2020-06-24 15:35:06</td>
<td>Y</td>
<td></td>
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<td>서울</td>
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<td>2020-06-22</td>
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<td>서울</td>
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<td>N</td>
<td>2020-06-17 21:17:23</td>
<td>Y</td>
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</tr>
</tbody>
</table>

Source: Medical Resource Report Portal, HIRA

### 1. Base date means the date that the operating status of negative pressure rooms is submitted

### 2. ~ 3. Data update and correction allowed, if the base date is the same with the current date

### 4. Only data search allowed for the ones submitted before the current date (correction not allowed)

Note: All the input data is sample, so it is not prohibited to use this data.
04 How to Report and Monitor the Operating Status

- Data update: 9 AM  
Contact: Central Disaster Management Headquarters (MOHW)

1 Base Date  

2 Negative pressure rooms status

<table>
<thead>
<tr>
<th>Total</th>
<th>Subtotal (A+B)</th>
<th>Occupied (A)</th>
<th>Availability (B)</th>
<th>Total</th>
<th>Subtotal (A+B)</th>
<th>Occupied (A)</th>
<th>Availability (B)</th>
<th>Total</th>
<th>Subtotal (A+B)</th>
<th>Occupied (A)</th>
<th>Availability (B)</th>
<th>Total</th>
<th>Subtotal (A+B)</th>
<th>Occupied (A)</th>
<th>Availability (B)</th>
<th>Total</th>
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</tbody>
</table>

- Total: No. of negative pressure rooms of the medical institution by type
- Occupied: No. of negative pressure rooms occupied by COVID-19 patients and other patients
- Availability: No. of negative pressure rooms available to administer COVID-19 patients on that day
- Negative pressure operating room: Calculated based on the beds available to operate COVID-19 patients

3 COVID-19 patients administered to the medical institution and their status by severity

<table>
<thead>
<tr>
<th>Total</th>
<th>Subtotal</th>
<th>Below moderate</th>
<th>etc</th>
<th>Subtotal</th>
<th>Severe or Worse</th>
<th>Mechanical ventilation</th>
<th>CRRT</th>
<th>ECMO</th>
<th>etc</th>
<th>No. of patients to be administered on that day</th>
<th>Below moderate</th>
<th>Severe or Worse</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

Source: Medical Resource Report Portal, HIRA

1 Base date is set as the current date to create a new report or change previous ones  
※ Medical institutes should submit their operating status of negative pressure rooms each day at 9 AM

2 Total (or subtotal) number is automatically calculated for the convenience of medical institutions in submitting their status

Note: All the input data is sample, so it is not prohibited to use this data.
## 04 How to Report and Monitor the Operating Status

### Medical equipment and medical staff

<table>
<thead>
<tr>
<th>Medical Equipment</th>
<th>CRRT</th>
<th>ECMO</th>
<th>Medical Personnel</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mechanical ventilation</strong></td>
<td>Availability to use additional equipment</td>
<td>1. Availability to use additional equipment</td>
<td>2. Infectious disease specialist</td>
</tr>
<tr>
<td><strong>Availability to use additional equipment</strong></td>
<td>Y</td>
<td>Y</td>
<td>22</td>
</tr>
</tbody>
</table>

- Infectious disease specialist, respiratory physician: Include all infectious disease specialists and respiratory physicians working at the hospital
- Infection control nurse: Total no. of nurses working at infectious disease control unit

### Person in charge

<table>
<thead>
<tr>
<th>Contact information (name/mobile phone)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Person in charge of reporting</strong></td>
</tr>
<tr>
<td><strong>Weekdays</strong></td>
</tr>
<tr>
<td>전화번호: 033-730-1000</td>
</tr>
</tbody>
</table>

### 1 ~ 3 Set to show the latest data submitted by default for the convenience of medical institutions

- A user is required to submit the availability to use additional medical equipment and information on person in charge

### 4 Move to the list by clicking the save button

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Note: All the input data is sample, so it is not prohibited to use this data.
### 04 How to Report and Monitor the Operating Status

The health authorities check the available medical resources in real time and promptly allocate the hospital beds accordingly for new confirmed cases by region.

#### 1. Search daily operating status on the base date

#### 2. Check the status of medical institutions of 17 cities/provinces

#### 3. This print option provides the data for the compilation of statistics

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**Note:** All the input data is sample, so it is not prohibited to use this data.
04 How to Report and Monitor the Operating Status

Available to print a report to identify the operating status of negative pressure rooms of medical institutions by region and hospital type

Available to find changes in the number of critically ill patients administered and availability of negative pressure rooms for 7 days from the base date

Source: Medical Resource Report Portal, HIRA
Negative Pressure Isolation Room Information System greatly contributes to providing treatment for COVID-19 severe patients promptly.

Identify the operating status of negative pressure rooms in real time to allocate the beds to COVID-19 patients for prompt medical treatments.

Compile the contact information of persons in charge at hospitals treating critically ill patients.
Thank You