Experience as an Infection Control Nurse in Introduction of Guidelines for Hospital Construction & Renovation

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Implementation Strategies

• Engage

• Educate

• Execute

• Evaluate
Engage

• Collaborate with respective department:

• Construction Manager, Architect, Engineers, Contractors, Plant services

• The Owner

• The Client

• The Design Team (A/M/E/C)

• The End User (Operator)

• Housekeeping

• Infection Control Practitioners
Engage

• Include leadership, role models and unit champion

• Engage executive leadership
Engage

• Multidisciplinary team input when writing guideline

• Consultation with trained individual with expertise in infection control prevention during renovation and construction
Educate

• Educational program include infection control Risk Assessment, risk factor, route of transmission, outcomes associated with infection, prevention measures, adverse effects of contact isolation, role of HCP, compliance rate with IPC measure
### ICRA - Steps

- **14 steps-tool**
  - Assess **environment** risk
  - Assess **patient** risk
  - Match the level of Infection Control **Precautions**

<table>
<thead>
<tr>
<th>Patient Risk Group</th>
<th>Construction Project Type (Environment Risk)</th>
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<tbody>
<tr>
<td></td>
<td>Type A</td>
</tr>
<tr>
<td><strong>Low</strong></td>
<td>I</td>
</tr>
<tr>
<td><strong>Medium</strong></td>
<td>I</td>
</tr>
<tr>
<td><strong>High</strong></td>
<td>I</td>
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<tr>
<td><strong>Highest</strong></td>
<td>II</td>
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</tbody>
</table>

**Class of Precautions***

* Class of Precautions **III or IV** requires Infection Control approval
Educate

- Target education programs on the basis of HCP, appropriate level for all relevant personnel
- Provide evidence that supports use of selected strategies eg: using Facility Guidelines Institute (FIG) guideline or APIC infection prevention manual
Educate

- E-learning for respective staff main contractors, sub-contractor, coaching sessions and one-on-one engagement on renovation site eg: putting up hoarding, cleaning process
Educate

• Provide standardized educational materials eg. Guidelines, skill training, observation tools
• External resources for Healthcare staff eg: CDC guideline
  http://www.cdc.gov/hicpac/pdf/guidelines/eic_in_HCF_03.pdf

Guidelines for Environmental Infection Control in Health-Care Facilities

Recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC)

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention (CDC)
Atlanta, GA 30333

2015

Educate

• Conduct workshops or update session for facilities team, nursing team, other stakeholders
Execute : Decision making?

• Hoarding

• Dust Control

• Management of debris

• Other Challenges
• **Hoard**ing: selection of type of hoarding due to patient movement and space constraint
  – Type of hoarding to select for the specific renovation
  – Is the room totally close or activity and patient care still need to continue
  – Will the hoarding affect patient movement and able to remove immediately during an emergency situation
  – How major is the project?
“Sarong” Hoarding for small project
Type of hoarding without patient or activity functioning

Plastic Hoarding

Plaster Hoarding
Hoarding with anteroom

- Large, dusty projects (Class IV)

- Gasketed door frames

- Full perimeters of walls tightly sealed
Other types of hoarding for large projects (Class IV) and external projects

- Calcium silicate hoarding
- Metal hoarding
Hoarding at the source
Cover up the soil to minimize dust migration
Execute: Type of item available for control dust?

• **Dust control** – HEPA filter, create negative pressure room to remove dust, dust screen and etc
  – Which type to choose?
  – Who maintain the cleanliness
  – Can the item selected used for all area to control dust
Window netting for non air-conditioned areas (including corridors)
Regular maintenance: vacuum + wash weekly
Creating negative pressure at work site

Filtered air is exhausted to outside of the work area

Air is drawn into the work site

With permission from John Marx, University of Wisconsin Hospital and Clinics
Negative pressure HEPA filter

- Capture particulates
- Create negative pressure at the site in relative to adjacent areas
- Filters are to be sealed and bagged securely at point of use before disposal
Portable HEPA Filter

• Portable HEPA filters are used at areas with high risk patients
• Trained staff to change filter and technical support from vendor
Methods to maintain negative pressure within the work site: Isolate HVAC

- Seal air vents, air intakes, grills
- Shut down HVAC system
- Add filters
Use dust / tacky mat for dust containment
Cleaning during and after renovation

- Damp mop the adjacent areas frequently
- Cleaning; manpower support for weekend
- Cleaning solution use such as sodium hypochlorite 5000ppm
Execute: How to remove debris from renovation site

• Debris Management
  – How to conceal waste during transportation
  – Choose the appropriate route
  – Appropriate time to remove debris
Bag debris into securely tied bag and remove daily
(at agreed hours – low traffic period)
Transport debris in a cart with lid

Wipe down the outer surface before leaving the work site
Designated route for debris transportation

Additional layer of vinyl flooring
Change to clean attire before leaving the site.
Traffic control

• Minimize procedure and waiting time near work zones

• Use a separate route – away from patients and staff
Other Challenges in execute phase

• Operation theatre: timeline constraint
• Water supply during water shut down
• Constrain in improving air exchange, install HEPA filter due to old building
• Constrain in creating sink in upgrading site due to existing piping and drainage system and selection of tap to prevent splashing
• Changing of new sink using mushroom pop up to facilitate cleaning
• Remodeling ward:
  – Propose to decrease number of beds for creation of toilet facilities in individual cubicle
  – Decanting of patient: bed limitation
Operating Theatre

• Operating theatre (OT): timeline to include microbial sampling prevent delay in re-opening OT
Water Supply

• Water supply during water shut down
Creation of HEPA filter for isolation ward

- Constraint in improving air exchange, install HEPA filter due to old building
- Involve expert input in creation of HEPA filter in new isolation ward in an old building
- Discuss guideline to check alignment with national law with respect to air discharge
New sink creation

• Constrain in creating sink in upgrading site due to existing piping and drainage system
• Selection of tap to prevent splashing
Sink Drainage System

• Replacement or changing of new sink drainage system using mushroom pop up to facilitate cleaning

Old sinks drainage system with grooves
New sinks drainage system without grooves
Remodeling ward

- Propose to decrease number of beds for creation of toilet facilities in individual cubicle
- Decanting of patient: bed limitation

C class Bed

B2 class Bed
Evaluate

- Assess compliance with infection prevention practices
- Review and update educational materials
- Monitor renovation and construction outcomes
- Monitor the trend on aspergillous
Assess compliance with infection prevention practices

• Performed by site contractor or supervisor

• Performed by Infection Control nurse on site inspection
Monitor renovation and construction outcome

- **Fungal Air Sampling**: Random air sampling is conducted 6 monthly at selected areas to monitor fungal spore counts during major construction.
THANK YOU