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Infection prevention and control, pillar for safety of healthcare worker: COVID-19 experience, Patan Hospital, Nepal

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Abstract

Infection prevention and control (IPC) programs play an integral part in the safety of patients, visitors, health care workers and environment as these programs provide guidelines and standard for recognition, prevention and control of infection. With COVID-19 pandemic, Patan Hospital, Patan Academy of Health Sciences, Nepal, is amongst the few hospitals in Nepal to have undertaken the responsibility of managing COVID patients. The COVID response plan has been activated and is currently the best prepared institution to manage this pandemic.

Keywords: COVID-19, Infection prevention and control (IPC), Nepal

Infection prevention and control (IPC) deals with the safety of healthcare workers (HCWs), customers and the environment through planning, policy development, implementation and monitoring. Standard IPC include basic measures such as hand hygiene, respiratory hygiene, appropriate environmental cleaning and proper waste management that should be used by all staff at all times.¹ Patan Hospital (PH) at Patan Academy of Health Sciences (PAHS) is the first hospital in Nepal to conduct a drill on epidemic outbreak management plan² and now is actively involved in COVID-19 response plan. On January 22, first meeting between department of general practice and emergency medicine and IPC committee (IPCC) was conducted with a motion to move ahead to prepare PAHS to handle COVID-19 cases. Multispecialty meeting was held on 26 January 2020 and first task group on COVID-19 was formed with focal person from various departments with specific role and responsibilities. Response was planned as plan A, B and C.

COVID-19 Response Plan A

Isolation ward- On 26 January 2020, a ten bedded room was selected on the 2nd floor of the hospital. The space was the most isolated with the least traffic and adequate ventilation maintained with exhaust fans. The room was converted into 5 bed capacity with minimum distance of 1-meter between each bed. Operational Support & Logistics Disease Commodity Packages from world health organization (WHO) was used as check list to prepare the room.

Staffing- Few staff nurses and doctors were posted in the isolation room and assigned as per admitted cases. By 27 January, all the staff involved were given donning and doffing training and briefed on hand hygiene, standard precautions, waste management and disease pathophysiology.

Standard precautions- Standard precaution among all area of healthcare was revisited

and strengthened. Additional droplet precaution was ensured in areas of concern like emergency, isolation ward and few anticipated outpatient departments (OPDs). Training on respiratory hygiene and cough etiquette was done.

Resource Mapping- Various IPC material needed for running isolation ward was listed and inventory was maintained. By 30 January, there were 600 pieces of waterproof disposable gowns, 5000 pieces of surgical gloves, 650 pieces of N95 respirators, 4000 pieces of surgical mask ready for use. Regular supply of hand sanitizer was maintained from hospital pharmacy on demand from IPC officer (IPCO).

Meetings- An IPCC meeting was held on 29 January 2020 where disinfection guideline was generated for COVID-19. One of the operating room was designated for COVID-19. Various shortest routes were identified for patient transfer. Do's and don'ts of patients during their hospital stay was defined. Protocol on patient management, central sterile service department (CSSD), housekeeping and waste was revised. Dedicated portable X-ray was assigned and double transparent plastic bagging method for taking x-ray and transport of cartridge was defined. Nasopharyngeal sampling technique, safety measures for sampling (triple layer packaging and disinfection) and transport was identified and implemented.

Hospital Incident Command System (HICS) was promptly activated on 16 March 2020, with vision to handle COVID-19 case up-to its fullest capacity. Isolation block with six isolation beds and 21 ICU beds with 15 ventilators and 15 positive cases bed (Plan B1) which could be increased to 30 positive case bed (plan B2) and 45 positive case bed (plan B3) was made ready. Plan C included closing whole hospital services except emergency, maternity, NICU and increased COVID blocks. Currently, PH is running on plan B1.



Figure 1. COVID ICU



Figure 2. Healthcare worker in PPE

COVID-19 response Plan B

Selection of COVID building- New hospital block, which was separate from hospital's main building and had its own lifts, water supply and adequate ventilation, was selected. Ground floor was developed into dedicated clinic, 1st floor was dedicated to isolation, 2nd to ICU and ward (plan B1 and B2) and 3rd floor ward (plan B3).

Preparation of COVID clinic, isolation and ward- Separate triage was established in front of the clinic. Three separate examination desks with adequate space in-between them were set. Five holding beds were arranged until patient could be transferred to isolation. The distance in-between was managed as per WHO interim guideline. Six separate isolation rooms were established with attached washrooms. The room had adequate lighting, ventilation and a separate nursing station with transparent closed glass system for added protection. Fifteen beds with 1-meter minimum distance in between were maintained with separate patient monitoring system like stethoscope, digital thermometer, digital pressure cuffs in the ward. Patient rounds were limited and surveillance camera was added for monitoring patient from remote site thereby decreasing exposure.

Staffing- Nurses and doctors were selected as per admitted case. All were adequately trained and given appropriate personal protective equipment (PPE).

Standard precaution- All HCWs were trained on hand washing, donning, doffing, movement in the building, waste management, laundry management, standard precaution and droplet precaution. The building was disinfected, waste and linen managed as per WHO interim guidelines. The entire building was cordoned off from rest of the hospital with fixed locked doors. Floor plans were developed with separate ante/clean room; donning doffing area, and exits. All the exits had 24-hour guards stationed who recorded entry and exit of staff as well as disinfect the hands and shoe sole when needed. All the waste was considered infectious and only segregated into infectious sharp and non-sharp waste in red bin with foot operated lids, collected by well-trained person with full PPE in closed containers once a day, treated in separate autoclave and disposed. Linen were collected in green plastic bag inside the green bin with foot operated lids, collected once a day by well-trained person with full PPE after tight seal, loaded in green laundry bin, taken to treatment area, cleaned and disinfected as per WHO interim guidelines, put on hold in housekeeping for 72 hours, repackaged and recirculated.

Resource Mapping- By 27 March 2020, most of the IPCC resources to run the COVID building properly for one month was managed. Alternate methods were applied to source materials like in-house making of PPE and visors. Materials that could not be made in-house were sourced through procurement

and donation. Quality check of all donated material were also done and only IPC verified products were circulated.

Improvisations- The PPE was made in the housekeeping department and the visors were made by basic science faculties using locally available materials. Floor plans, written guides and pointers necessary inside the building was posted in appropriate areas. Acrylic box was designed, tested and implemented to prevent HCWs from aerosols generated during intubation. The HCWs were encouraged to wear scrubs inside hospital premises and were also discouraged to bring personal items. All staff were asked to follow bare below elbow policy and stop unnecessary gathering. Visitors were asked for home quarantine and patient were refrained from personal belongings like phone, laptops and utensils.

Meetings- Regular brief meeting with in-charges and chairs/head of the departments were conducted to update on IPC strategies.

In conclusion, a robust IPCC team and IPCO along with updated IPC manual were developed and timely implemented as an integral part at Patan Hospital, Patan academy of health science to reduce the morbidity and mortality associated with health care in the context of COVID-19.

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Conflict of Interest

None

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Author Contribution

All authors contributed equally.

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