

Proposed Protocol for Improving Staff Nurses' Awareness and Self – Efficacy with Novel Coronavirus SARS-Cov-2 Outbreak

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ABSTRACT

The awareness and preparedness in managing Novel Coronavirus SARS-CoV-2 Outbreak infection are most important to prevent the further spread. **Aim:** This study aimed to propose a protocol for improving staff nurses' awareness and self – efficacy with Novel Coronavirus SARS-CoV-2 Outbreak. **Subjects and Method:** A descriptive design was utilized in this study that was conducted in the units of Critical Care and Emergency for adults (surgery, medicine) and pediatrics at El - Sayed Galal and Ain Shams University Hospitals. A random sample was composed of 180 nurses with different ages, gender, education and experiences were recruited from the above mentioned settings. The study tools were: 1) Self-administered questionnaire sheet to assess nurses' awareness about Novel Coronavirus SARS-CoV-2 Outbreak. 2) General self-efficacy scale. 3) Ways of Coping Questionnaire for Staff Nurses. 4) Competency obstacles assessment sheet. **Results:** Mean age of studied nurses was 33.4±27.2 added to their awareness and self- efficacy need for improvement. Moreover, there were many obstacles affecting their competency. **Conclusion:** Overall, the current study concluded that nearly half of studied nurses had satisfactory awareness about Novel Coronavirus SARS-CoV-2 and their role during the outbreak. Meanwhile, less than half of them had high self – efficacy and positive coping. In addition, majority of them had competency obstacles during their work on outbreak time. **Recommendations:** Further research study should be done to implement and investigate the effect of this proposed protocol for such group of nurses.

KEYWORDS: Novel Coronavirus SARS-CoV-2 Outbreak - Proposed Protocol - Staff Nurses' Awareness and Self – Efficacy

INTRODUCTION

In December 2019, some cases of viral pneumonia were epidemiologically related to a new coronavirus in province of Hubei, China. Subsequently, there has been an increase in infections throughout China and worldwide. World Health Organization has officially named the infection coronavirus disease 2019 (COVID-19) and virus classified as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Clinical presentation of 2019-nCoV infection ranges from asymptomatic to very severe pneumonia with acute respiratory distress syndrome, septic shock and multi-organ failure that may result in death. Coronaviruses are believed to be transmitted from person-to-person through inhalation or deposition on mucosal surfaces of large respiratory droplets. Other routes of transmission are contact with contaminated fomites and inhalation of aerosols, produced during aerosol generating procedures (Chen et al., 2020 & Jiang et al., 2020).

The highest risk of healthcare-associated transmission is in absence of standard precautions, when basic infection prevention and control measures for respiratory infections are not in place. The prognosis is worse in elderly patients

with comorbidities. To date, there is no specific therapy for COVID-19. Prevention of SARS-CoV-2 infection implies strategies that limit the spread of the virus. WHO and other international and national bodies have developed continuously updated strategic objectives and provisions to contain the spread of the virus and infection (CDCP, 2020 & Lu, 2020).

In outbreaks of infectious diseases, role of the nurse changes to adapt to patients' needs, their families and hospital. Articulating the changes in nurses' role is helpful for plan communication to decrease disease spread and for implementing improved policies, procedures and supplies. During an epidemic, all usual essential tasks must be completed for patient, but they are frequently intensified. Having a large surge of very ill patients puts a stress on the entire health care system (Nemati et al., 2020 & PHE, 2020). Many of procedures that nurses initiate (such as deep breathing and coughing, assisting with bronchoscopy, intubation/ extubation cardiopulmonary resuscitation, taking sputum samples and suctioning) may be the method of coronavirus aerosolization. Furthermore, nurses were

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main educators and resource for information with regular communication to families about the disease. They were asked to refer patients to Ministry of Health website, hand-outs and hotline for more information relaying consistent and up-to-date messaging to avoid mixed messages and confusion (ECDC, 2020 & Stirling et al., 2017).

Emergency and critical care units are characterized by a large number of patients at imminent risk of death, unpredictable events, long working hours, lack of human and material resources, inadequate infrastructure, pressure from management, requests from family members, reduced time to perform care and daily contact with the process of death and dying. In recent years, there has been an increase in demand of patients in critical care and emergency units services as well as the complexity of cases, situations that require quick and assertive behavior from the healthcare team, which needs to be guided by scientific knowledge, skill, self-control and efficiency (CDCP, 2020 & Giovanni et al., 2020).

Urgent and emergency nursing care is regarded as a trigger of physical and emotional wear and stress, since the environment in which it operates is comprised of joint actions by a multidisciplinary team committed to the requirements of the work process, and responsible for the well-being and life of the patient. Nurses play critical roles in the prevention of the COVID-19 outbreak through proper care and preventive procedures because of their direct contact with patients (Nemati et al., 2020 & Al-Mohaisen, 2017).

Self-efficacy is a psychological construct defining a person's confidence in performing a particular behavior and overcoming barriers to that behaviour. Nurses with high self-efficacy have been shown to practice more efficient leading to better disease control. Moreover, greater self-efficacy may improve the outcomes through specific behaviors (Zelle et al., 2016).

Many factors affecting nurses' competency such as workload, task complexity, patient mortality and morbidity rate, emergencies admissions, transfers, communication problems, noise, inappropriate staffing and equipment. There are some factors that may affect on nurses' competency: physical such as noise, ventilation and equipment. Psychological such as monotony of work and lack of job satisfaction. Administrative such as: work policy and job description. Social such as relation with patient, supervisors and physicians (Seada & EL- Banan, 2016).

Aim of the Study:

This study aims to propose a protocol for improving staff nurses' awareness and self-efficacy with Novel Coronavirus SARS-CoV-2 Outbreak through the following:

- Assessment of studied staff nurses' awareness as regards outbreak of Novel Coronavirus SARS-CoV-2
- Assess studied nurses' level of coping
- Identifying self efficacy level among studied nurses as regards current outbreak of Novel Coronavirus SARS-CoV-2
- Identify the obstacles affecting on studied nurses' competency

- Propose a protocol for improving staff nurses' awareness and self-efficacy during outbreak of Novel Coronavirus SARS-CoV-2.

Research questions:

- What is the level of awareness among studied nurses?
- What are the obstacles affecting on studied nurses' competency?
- What are the level of coping and self-efficacy among studied nurses?

Subjects and Method:

Operational definitions:

Competency: means knowledge and practices.

Protocol: Is a set of "Rules" and "Regulations" for sending and receiving information by using the standard protocols.

Research Design: A descriptive design was used for the conduction of this study.

Setting: This study was conducted in the units of Critical Care and Emergency for adults (surgery, medicine) and pediatrics at El - Sayed Galal and Ain Shams University Hospitals.

Subjects: A random sample was composed of 180 nurses with different ages, gender, education and experiences. They were taken as follows: 90 nurses from each hospital whereas, 30 nurses from each department of surgery, medicine and pediatrics. They were taken according to the following criteria:

Inclusion criteria:

- Nurses willing to participate in the study.
- Nurses with different experiences.

Tool of Data Collection:

1. Self-administered questionnaire sheet that was designed by the researchers after reviewing related literature and consulting experts. It was written in simple Arabic language and divided into the following part:

Part I: Characteristics of the studied nurses as regards age, qualifications and experiences.

Part II: Nurses' awareness assessment sheet: It included the knowledge of participants about:

- COVID-19.: sources, transmission, incubation period, risk factors, manifestations, prognosis, mortality rate, complications, medical management.

Nurses' role during outbreak of COVID-19: Administering medications - Assessing patients' health - Apply infection control measures - Follow safety measures - Communication with health team - Delegating work - Documenting - Emotional counseling - Patient hygiene - Making evidence based decisions - Collecting specimens - Nutrition and hydration - Disease prevention and health promotion - Setting priorities - Teaching patients and families - Education role toward other staff

Scoring system:

The satisfactory level was considered from 60%, while the unsatisfactory level was less than 60%.

2. General self-efficacy scale: It was developed by Schwarzer & Jerusalem (1995) to assess a general sense of perceived self-efficacy with the aim to predict coping with daily hassles as well as adaptation after experiencing all kinds of stressful life events.

Scoring system:

Responses are made on a 4-point scale. Sum up the responses to all 8 items to yield the final composite score with a range from 8 to 32. Rating scale (1 = Not at all true, 2 = Hardly true, 3 = Moderately true and 4 = Exactly true). Level of self-efficacy was considered high if the score 60% or more and low if it less than 60%.

3. Ways of Coping Questionnaire for Staff Nurses: It was developed by Folkman and Lazarus (1985). The items of this instrument are divided into eight factors: confrontation, distancing, self-control, social support, acceptance of responsibility, escape-avoidance, problem solving and positive reappraisal. These factors were classified into two categories: (1) functional strategies, comprising self-control, social support, problem solving and positive reappraisal; (2) dysfunctional strategies, corresponding to confrontation, distancing, escape-avoidance and acceptance of responsibility.

Scoring system:

Questionnaire consists of 66 items which are responded to on a four-point Likert scale (0 = does not apply and/or not used, 1= used somewhat, 2= used quite a bit, 3 = used a great deal).

4. Competency obstacles assessment sheet. It included series of questions related to the obstacles affecting on studied nurses' competency that include: Resources (human and equipment and supplies), emergency readiness for infectious diseases, lack of orientation, under staffing, work policies and procedures, staff training, non-nursing duties and patients` support .

Scoring system:

Answers of the studied nurses regarding the presence of obstacles (scored as two marks) or absence (scored as one mark) were categorized into either yes or no. The total items of performance obstacles = 8 item, whereas absence of the obstacles were considered from (1- 8) and presence of the obstacles from (8 - 16).

Content validity:

It was assured by a group of experts from CCU and Medical-Surgical Nursing. Their opinions were collected as regards to tools format layout, consistency and scoring system. Tools` contents were tested regarding to the knowledge accuracy, relevance and competence.

Ethical Considerations:

Approval was obtained from Directors of the above mentioned settings in the planning stage. All nurses were informed about the study and their rights according to medical research ethics to participate or not in the study. Then they consent to participate in the study.

Pilot study:

A pilot trial was conducted on 10% of the total study subjects to test the clarity and practicability of the tools, in addition to sample and settings. Pilot sample were later included in the study as there were no radical modifications in the tools.

Procedure:

- The study was started and completed within 3 months.
- The study aim was simply explained to the studied nurses at first.
- The researchers started to collect data from them at the above mentioned settings using the pre constructed tools till completion of data collection.
- The data were collected 2 days/week at morning and afternoon shift.
- The study tools was filled by the staff nurses while they were on duty according to their understanding and health condition as follows:
- All studied nurses were assessed in groups that entail 3-5 nurses according to their physical and mental readiness using the previously mentioned study tools.
- The proposed protocol was designed based on analysis of the actual nurses' opinion assessment by using the pre constructed tools.
- Content of the proposed protocol was consistent with the related literatures (national and international).
- The proposed protocol was cover the following items:
 - Awareness of the studied nurses with Novel Coronavirus SARS-CoV-2.
 - Improving self- efficacy and coping methods
 - Competency obstacles solutions.
- Testing validity of the proposed tools using face and content validity.

Statistical analysis:

Data were organized, tabulated and analyzed using number, percentage, mean and standard deviation.

Results:

Table 1: Characteristics of the studied nurses on different hospitals (n=180)

Items	Studied Nurses	
	No	%
Age	33.4±27.2	
Gender:		
Male	35	19.4
Female	145	80.6
Education:		
Diploma of nursing	91	50.6
Bachelor	57	31.7
Postgraduate	32	17.7
Years of experience:		
> 5yrs	130	72.2
5yrs. & more	50	27.8
Previous training		
Yes	106	58.9
No	74	41.1

Table (1): Presents characteristics of the studied nurses, this table clarified that, mean age of them was (33.4±27.2). Regarding gender, majority (80.6) of them were female. Concerning years of experiences, previous training and education, more than half of them were less than 5years of experiences, with previous training and had diploma degree and (72.2, 58.9 &50.6 respectively).

Table (2): Presentation of studied nurses' satisfactory awareness about Novel Coronavirus SARS-CoV-2

Nurses` Satisfactory Awareness about Virus	Studied Nurses N= 180	
	No	%
Sources,	112	(62.2)
Tansmission	84	(46.7)
Incubation period	91	(50.6)
Risk factors	110	(61.1)
Manifestations	114	(63.3)
Prognosis / mortality rate	83	(46.1)
Complications	81	(45.0)
Medical treatment	115	(63.9)
Mean No ± SD	98.7 ± 15.3	
% of Mean	54.8	

Table (2): Reveals nurses' satisfactory awareness about Novel Coronavirus SARS-CoV-2. Results revealed that medical treatment, manifestations, sources were represent the highest percent of nurses' satisfactory awareness (63.9, 63.3 & 62.2 respectively). Moreover, mean percent of satisfactory awareness was 54.8 %.

Table (3): Presentation of studied nurses' satisfactory awareness about their role during outbreak of Novel Coronavirus SARS-CoV-2

Satisfactory Awareness about Nurses Role	Studied Nurses N= 180	
	No	%
Administering medications	104	(57.8)
Assessing patients' health	87	(48.3)
Apply infection control measures	113	(62.8)
Follow safety measures	93	(51.7)
Communication with health team	75	(41.7)
Delegating work	77	(42.8)
Documenting	95	(52.8)
Emotional counseling	81	(45.0)
Patient hygiene	76	(42.2)
Making evidence based decisions	94	(52.2)
Collecting specimens	98	(54.4)
Nutrition and hydration	85	(47.2)
Disease prevention and health promotion	94	(52.2)
Setting priorities	87	(48.3)
Teaching patients and families	80	(44.4)
Education role toward other staff	105	(58.3)
Mean No ± SD	90.3 ± 11.2	
% of Mean	50.2	

Table (3): Reveals nurses' satisfactory awareness about **their role during outbreak of** Novel Coronavirus SARS-CoV-2. Results revealed that applying infection control measures, education role toward other staff and administering medications were represent the highest percent of nurses' satisfactory awareness (62.8, 58.3 & 57.8 respectively). Moreover, mean percent of satisfactory awareness was 50.2 %.

Table (4): Presentation of high self - efficacy level among the studied nurses during outbreak of Novel Coronavirus SARS-CoV-2

Items of Self - Efficacy	Studied Nurses	
	High Self - Efficacy N= 180	
	No	%
Solve difficult problems if try hard enough.	89	49.4
Find means and ways to get what want	74	41.1
Easy to stick to aims and accomplish goals.	91	50.6
Confident to deal efficiently with unexpected events.	99	55.0
Know how to handle unforeseen situations	85	47.2
Solve most problems if invest the necessary effort	93	51.7
Remain calm when facing difficulties	79	43.9
Find several solutions when confronted with any problem.	105	58.3
Mean No ± SD	89.4 ± 10.1	
% of Mean	49.7	

Table (4): Reveals a **high self - efficacy level among the studied nurses during outbreak of** Novel Coronavirus SARS-CoV-2, Results revealed that Find several solutions when confronted with any problem. Confident to deal efficiently with unexpected events and solve most problems if invest the necessary effort were represent the highest percent of nurses' **self - efficacy** (58.3, 55.0 & 51.7 respectively). Moreover, mean percent of high self - efficacy was 49.7 %.

Table (5): Presentation of positive coping among the studied nurses during their work

Items of Coping	Studied Nurses (n= 180)	
	Positive Coping	
	No	%
Confrontation.	104	57.8
Distancing	73	40.6
Self-control	81	45.0
Social support.	94	52.2
Acceptance of responsibility	103	57.2
Escape-avoidance	60	33.3
Problem solving	77	42.8
Positive reappraisal	82	45.6
Mean No ± SD	84.3 ± 15.2	
% of Mean	46.8	

Table (5): Reveals a **positive coping among the studied nurses during their work on outbreak of Novel Coronavirus SARS-CoV-2**, Results revealed that confrontation., acceptance of responsibility and social support were represent the highest percent of nurses' **self - efficacy** (57.8, 57.2 & 52.2 respectively). Moreover, mean percent of positive coping was 46.8 %.

Table (6): Presentation of nurses` competency obstacles during their work

Competency Obstacles	Studied Nurses (n= 180)	
	No	%
Lack of resources (equipment and supplies)	150	83.3
Inadequate emergency readiness for infectious diseases	134	74.4
Under staffing and high workload	145	80.6
lack of orientation and staff training	153	85.0
Work policies and procedures	155	86.1
Non-nursing duties	138	76.7
Patients` psychological support	168	93.3
Fear from exposure to infectious diseases	176	97.8
Mean No ± SD	152.4+14.2	
% of Mean	84.7%	

Table (6): Reveals **nurses` competency obstacles during their work on outbreak of Novel Coronavirus SARS-CoV-2**, Results revealed that fear from infection., psychological support and policies and procedures and lack of orientation were represent the highest percent of nurses' **competency obstacles** (97.8, 93.3, 86.1 & 85.5 respectively). Moreover, mean percent of **competency obstacles** was 84.7 %.

Discussion:

Knowledge level about a particular infectious illness can be influenced by the spread of the disease, seriousness of the illness, and methods for sharing and distribution of knowledge. In recent decades, implications and consequences of transformations in workplace have drawn attention to studies relevance on psychosocial risks at work, which identified as one of greatest contemporary challenges for health and safety at work related to problems such as stress (Giovanni et al., 2020 & Nemati et al., 2020). The present study aimed to propose a protocol for improving staff nurses` awareness and self – efficacy with Novel Coronavirus SARS-CoV-2 Outbreak.

Concerning characteristics of the studied nurses, more than half of them were less than 5years of experiences, with previous training and had diploma degree. The present study results focused on lack of training, shortage of the qualified nurses and absence of orientation programs that diminish uncertainty, relieve anxiety and help to build self-confidence. Stirling et al. (2017) emphasized that, infected patients had

a right to be cared by specialized trained and educated nurses. In addition, training programs should be held to keep them up to date and acquire more knowledge. Also, most

recent nurses` knowledge has been seen as a vehicle to respond correctly during this outbreak.

As regards nurses' satisfactory awareness about their role during outbreak of Novel Coronavirus SARS-CoV-2. Results revealed that applying infection control measures, education role toward other staff and administering medications were represent the highest percent of nurses' satisfactory awareness. Nemati et al. (2020) reported that nurses had almost good knowledge about COVID-19. However, more information still must be provided by the WHO and the Ministry of Health for medical staff to mediate the better control of the infectious disease.. Zhou et al. (2020)& Cohen et al. (2012) mentioned that this epidemic is particularly important for nurses to be aware of as a high proportion of cases are among healthcare workers. They can be highly vulnerable to infection and often, the gaps in their knowledge around infection control are severe. Beyond complexity of dealing with an increased demand for care due to critical progression of patients, transmission from patient-to-nurse and from patient-to patient/visitor/other staff is also of concern.

In relation to high self - efficacy level among the studied nurses during outbreak of Novel Coronavirus SARS-CoV-2. Results revealed that find several solutions when confronted

with any problem, confident to deal efficiently with unexpected events and solve most problems if invest the necessary effort were represent the highest percent of nurses' self - efficacy. **Du Toit (2020) & Worldometers (2020)** recognized that attention to general population education regarding transmission modes, prevention methods and treatment options are of most extreme significance. Members demonstrated the good level of information about sources of infection and prevention. Main source of information was social media, television, broadcasting or news, and health advertisements.

Considering positive coping among the studied nurses during their work on outbreak of Novel Coronavirus SARS-CoV-2. Results revealed that confrontation., acceptance of responsibility and social support were represent the highest percent of nurses' self - efficacy. **Ribeiro et al. (2015)** reinforce that confrontation is important to change a situation. In distancing, the individual tries to get away from the stressful circumstances without changing the situation that led to stress. Tus, professional may have defensive behaviors such as not expressing their views to colleagues, and accepting an imposed behavior, to avoid stress because these units have high turnover and working in them entails close proximity to death, both of which hinder bonds creation. Acceptance of responsibility, where the individual recognizes their role in the problem, accepts reality and engages in process of dealing with stressful situation. Moreover, the self-control strategy is of paramount importance in the emergency care unit, as most situations are unforeseen, and decision-making should be quick and effective (**Al-Mohaisen, 2017**).

Regarding nurses` competency obstacles during their work on outbreak of Novel Coronavirus SARS-CoV-2. Results revealed that nurses competency is affected negatively by inadequacy of equipment, ventilation, cleaning and unsuitable design and contact with infectious diseases. Moreover, inadequate policies, procedures, staff training and inconstant availability of medical staff. Nurses reported that conflict among them, no team work had a negative effect on their performance (**Seada & EL- Banan, 2016 and Stirling et al., 2015**).

Conclusion:

Overall, the current study concluded that nearly half of studied nurses had satisfactory awareness about Novel Coronavirus SARS-CoV-2 and their role during the outbreak. Meanwhile, less than half of them had high self – efficacy and positive coping. In addition, majority of them had competency obstacles during their work on outbreak time.

Recommendations:

- The proposed protocol that's evidence – based should be implemented and evaluated.
- Continuous education should be held to help the newly appointed and old staff nurses.
- Regular updating in Novel Coronavirus SARS-CoV-2 Outbreak.
- Job description should be available
- Further research study should be done to implement and investigate the effect of this proposed protocol for such group of nurses.

Based on findings of the present study, proposed protocol for improving staff nurses` awareness and self – efficacy with Novel Coronavirus SARS-CoV-2 Outbreak has been established (Appendix I).

Appendix I

A developed protocol for improving staff nurses` awareness and self – efficacy with Novel Coronavirus SARS-CoV-2 Outbreak.

Purpose:

Outline the methods of improving staff nurses` awareness and self – efficacy with Novel Coronavirus SARS-CoV-2 Outbreak.

Proposed Protocol Contents:

A. Development of nurses' awareness and self – efficacy:

Nurses should have sufficient awareness about:

- Deal with emergency situations / Priorities of care.
- Apply all safety measures for patients
- Assist in emergency procedures
- Implement protocols for treatment.
- Provide support to patient families.
- Maximize communication.
- Nurses' competency obstacles.

B. Management of nurses` competency obstacles:

- **Physical:** Supplies and equipment - Design quality: space, temperature, ventilation, lighting, noise, vibration, infection, air quality.
- **Psychological:** Well trained in emergency situations during infectious diseases outbreak
- **Administrative:** Clear job description / Staff training - Adequate work policies and procedures
- **Social:** Conflict resolution strategies - Encourage team work.

C. Treatment Protocol in Hospital Areas :

I. Outpatient clinics

• Before attendance at outpatients

- Develop a system prior to attendance (e.g. phone call, SMS), to ask patients whether they've been overseas or have had close contact with a person with confirmed COVID-19 while infectious, in 14 days before scheduled outpatient appointment.
- If patient meets the above criteria:
- Consider alternative methods of conducting appointment (e.g. telephone or tele-medicine) or reschedule unless it is medically necessary.
- Reschedule appointment for as soon as possible after 14 day exclusion
- Remind patient to 14 days home self-isolate after returned or if close contact with confirmed COVID-19 person.
- Remind patient if develop respiratory symptoms or fever to call health direct.
- Appointing an appropriate person to assess whether or not it's safe to defer the outpatient appointment.

• During outpatient attendance

- Asking patients whether had been overseas in last 14 days or had close contact previous 14 days - wear a surgical mask - have any respiratory symptoms or fever.

- Patients who do not report any respiratory symptoms or fever: Remind them for self-isolate at home for 14 days
- Patients who report symptoms manage them in conjunction with emergency department as per the clinician guidance.
- Other guidance: ensure availability of surgical masks and hand hygiene facilities

II. Emergency Department (ED) Care

- Diversion of non-critical possible COVID-19 cases at a triage point prior to ED entry (“parking lot triage”)
- Use of current Airborne Infection Isolation Room (AIIR) isolation rooms, and plan areas for cases increases
- Use of specific space (e.g., urgent care, pediatric, same-day surgery waiting) for isolation from an air-handling and movement standpoint.
- Use of discharge waiting areas (if not routinely used)
- Staff wear PPE at all times,
- Changes in patient flow and charting that can expedite non-emergency visits
- Coordination with patient placement/command center so admission and discharge criteria can be flexible depending on patient loads
- Coordination with EMS, including through telephone triage, to avoid ED visits that can safely be cared for as outpatients

III. Inpatient Care

- Hospitals should have a staged plan to accommodate initial cases in AIIR isolation rooms,
- Progress to cohorting in isolation rooms,
- Cohorting on specific units (require adjustment of ventilation to create negative airflow and creation of temporary partitions in hallways/entryways).
- As cases accumulate, units and floors may be converted to cohort units.
- If the number of cases increases, a designated unit may be needed for non-infectious hospitalized patients (understanding that some of these patients may still be infected).
- Caring for and protecting obstetric and pediatric patients are important.
- Older patients and those with comorbid diseases are much more affected than pediatric patients.
- As demand for inpatient resources grows, the focus should be on accommodating a surge in critical care patients. Spaces such as pre- and post-anesthesia care; same-day surgery; and other monitored procedural areas such as gastroenterology labs, intermediate care, and monitored/step-down units should be assessed for critical care expansion.
- Some rooms in the hospital may accommodate more than one patient.
- Cancelling elective procedures that require hospital admission can help initially, but if the epidemic is prolonged this strategy may have to be re-evaluated.
- Visitor restrictions are needed as community cases increase unless the family member is needed to provide personal care or feeding assistance.
- All visitors should be instructed to comply with the PPE and other infection control policies.
- Electronic visiting can be used to replace in-person visits.

IV. Critical Care for COVID-19 Patient

- Patients should wear simple flexible fabric masks to reduce droplet generation unless wearing an oxygen mask
- Oxygen and its administration supplies may need to be conserved.
- Intermittent rather than continuous oximetry and cardiac monitoring may be instituted
- Use inhalers in lieu of nebulized medications to reduce droplet generation
- Coordinate with critical care physicians regarding threshold for intubation and use of bridging techniques (e.g., high flow cannula/BiPAP), which may require a special area and augmented
- PPE (e.g., PAPR) for providers given the higher risk of aerosol generation
- Use rapid sequence intubation (RSI) techniques during intubation to minimize aerosol generation
- Aggressively control and suppress patient cough, as possible
- Reduce suctioning as possible
- Consider more aggressive sedation/paralysis strategies to reduce coughing.
- Expect a prolonged course of mechanical ventilation [35]; therefore, “trial periods” of a few days are not recommended as improvement may not occur for days or even weeks.

V. Elective Surgery

All non-urgent elective surgery is temporarily suspended. Only Category 1 and some exceptional Category 2 surgery will continue until further notice.

For urgent surgery only, staff are required to ask patients at the time of booking confirmation if they have:

Criteria

- Overseas in last 14 days
- Close contact with a person with confirmed COVID-19 while infectious, during the 14 days before their scheduled surgery

Action

- Postpone surgery until 14 days after last contact day if it will not significantly impact patient outcomes .
- Ensure surgery is re-scheduled as soon as practicable after 14 day exclusion period has lapsed

VI. Who requires follow-up?

- A worker who provided direct clinical or personal care to, or examined, a symptomatic confirmed or probable case involving direct face-to-face contact within two metres of the case OR
- A worker in the same room at the time an aerosol-generating procedure was performed on a confirmed or probable case AND
- Who was not wearing gown/gloves/eye protection/N95 respirator Visitors who require follow-up (by local public health unit):
- Visitors at the bedside of a confirmed case for more than 15 minutes without wearing gown/gloves/surgical mask/eye protection (i.e., not adhering to Droplet/Contact Precautions)

VII. What follow-up is required?

For those who require follow-up:

- Assess daily for respiratory symptoms for 14 days (may be active or passive for persons not present in the hospital; those working should be screened at the beginning of each work shift).
- If fever or any respiratory symptoms develop, exclude the individual from work and restrict to home.
- Collect appropriate laboratory specimen for persons under investigation for possible MERS-CoV infection.
- Viral antibody testing.

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