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EDITORIAL COMMENTARY

## Nursing a patient with Covid-19 infection

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### Abstract

The procedures to be followed by nursing staff caring for patients with Covid-19 coronavirus infection have not been emphasised. Though care plans are likely to follow traditional treatment methods, nursing attitudes and methods may be affected by what is currently known about the nature of Covid-19 infection. I describe the salient features of Covid-19 infection and how these affect bedside nursing care, including controversial areas such as control over patient visitors. *J Evidence-based Nurs Prac 2020: 1(1); 4-8*

### Introduction

As readers will know, novel coronavirus infection Covid-19 (previously 2019 N-CoV) has been declared by the World Health Organisation as a “Public Health Emergency of International Concern”.<sup>1</sup> On 11 February, cases have arisen in 21 countries but the centre of the outbreak remains in China, with over 99% of known cases. Australia then had 15 cases (5 have recovered) and New Zealand none. The precise number infected globally remains uncertain, but on 22 February 2020 was over 76,000, and over 2,247 patients had died.<sup>2</sup> One authority has predicted that the epidemic could infect 60% of the world’s population, a truly frightening thought.<sup>3</sup> Clearly, population-level interventions such as isolation, contact tracing and

immunization as soon as an effective vaccine is available are essential, but in the meantime health professionals have to be ready to treat individuals. This is made easier if they are aware of the properties of this organism and the clinical course of infection. The purpose of this review is to describe briefly the clinical symptoms and then discuss the optimum nursing management of patients admitted to hospital with Covid-19 infection. The primary role of nurses in treating and containing Covid-19 has been recognized by the International Council of Nurses, which has sent messages of goodwill and support to the corresponding Chinese organization.<sup>4</sup> This Journal commends and supports this action.

## Covid-19

Covid-19 is a zoonotic RNA virus, one of the family of coronaviruses. It is likely to have jumped species from bats to humans.<sup>5</sup> Non-Covid-19 coronavirus infection in humans generally results in a mild but sometimes epidemic infection of the upper respiratory tract, and subtypes of the virus have caused major disease outbreaks (SARS, MERS). Because Covid-19 has jumped a species barrier, at the outset of the present pandemic humans had no natural immunity. Influenza is also an RNA virus but is distinct from coronaviruses. Covid-19 is atypical in that patients may be infectious before symptoms develop.<sup>6,7</sup> This has probably contributed to the  $R_0$  value (the average number of persons in a population infected by an individual with the disease) of 2.68. This number is high and implies that the number of infected patients may double every 6 days without other measures. Thus early identification of cases is vital.

## Case definition

WHO and the CDC and national and local health authorities have defined a suspect case as an individual with relevant symptoms (see below) who has travelled to or via mainland China in the previous 2 weeks or has been in contact with a confirmed case. This definition is likely to change as the geographical distribution of the disease evolves. Persons who meet the current definition should be isolated and tested for Covid-19 by PCR on throat swabs. Body tissues or secretions must not be sent to the laboratory for other methods of viral analysis.

## Specific treatment

Broadly speaking, RNA viruses are resistant to antiviral drugs but oseltamivir was given to 124 of 138 reported patients in China (see below), remdesivir (developed to treat ebola) has been given to a single patient in the US on the basis of positive in-vitro tests, and lopinavir/ritonavir is being tested in China. The first study could not and did not report on the effectiveness of oseltamivir, and until the clinical effectiveness of these drugs is confirmed, use of antiviral drugs is empirical.

## Clinical course and laboratory abnormalities

The clinical course of Covid-19 disease has been described in a case series<sup>8</sup> of 138 adult patients admitted to Zhongan Hospital of Wuhan University, China from 1 – 28 January 2020. The

period of observation ended on 3 February 2020 with the majority of patient still in hospital. Thus the study data, though detailed, must be regarded as provisional. There was a slight preponderance of males (54.3%). Thirty-six percent of patients required ICU admission and 6 (4.3%) died. The most common presenting symptoms were fever (98.6%), fatigue (69.6%), dry cough (59.4%), myalgia (34.8%), and dyspnoea (31.2%). Diarrhoea with nausea were the presenting complaints in 14%, raising the possibility of fecal-oral spread. Thirty-six patients were admitted to ICU because of organ failure, notably pneumonia with respiratory distress (27), arrhythmia (23), shock (12), cardiac injury (8) or acute kidney injury (3). Patients admitted to ICU were older than non-ICU patients (66 vs 51 years) and were more likely to have cardiovascular co-morbidities.

The laboratory results on admission in the same study were notable for absence of marked leucocytosis but lymphopenia was common and even lower in ICU patients. Leucocyte counts were moderately higher in ICU patients. Platelet counts and other blood clotting tests were normal except perhaps for D-dimer in ICU patients. Lactate dehydrogenase (LDH) was raised but liver transaminases were normal. Procalcitonin was raised in all patients, suggesting a high incidence of secondary bacterial infection, and all had patchy shadowing on chest radiographs, or ground-glass appearance on lung computerized tomography.

## Nursing patients infected with Covid-19

State Health Departments, The Commonwealth of Australia, New Zealand, CDC and WHO etc have published information on Covid-19 and how to deal with it. Several important though obvious messages for nurses and their workplace are emerging:

1. **Institutional responses:** Each hospital or health service must accept full responsibility for funding required infection control measures and training staff in infection control and in providing a safe work environment. This responsibility will naturally percolate up the health and political systems in each jurisdiction, especially in countries, such as in Australasia, with strong public hospital systems. Since compliance with infection control methods may be sub-optimal, hospitals should not rely on prevailing staff knowledge of or compliance

- with infection control but must take active steps to train or retrain staff and emphasise the vital importance of the techniques in this condition.
2. **Prevention of intrahospital spread:** Preventing further spread of this condition is also of vital importance. To assist in this, hospitals will mandate provision of advance notice of incoming patients. Advising the public health authorities is also mandatory.
  3. **Patient personal protective equipment (PPE):** The patient must be masked effectively *before* admission to a hospital. Nursing staff must not enter the room or approach a patient without full PPE already in place. This should include footwear (as is commonplace for workers in theatre) and goggles or faceshield. When removing PPE, fold material carefully so as not to touch the external surfaces that faced the patient.
  4. **Reassuring the patient:** Patients are likely to be fearful and will require support and reassurance, including imparting the information that recovery is highly likely and that the risk of death is low.
  5. **Quarantining:** Patients should be quarantined in negative-pressure treatment rooms if available. If none is available, use single rooms. If these are in short supply, give priority to patients who have conditions facilitating transmission (open wounds, incontinence etc). Patients infected with the same organism may be accommodated communally but screening curtains should be extended.
  6. **Patient intra-hospital transport:** Patient transport out of the treatment room must be kept to a minimum and when necessary should avoid public areas. Procedures should be performed in the room wherever possible. If transport between floors is necessary, a lift should be dedicated to Covid-19 patients. One common reason for transfer will be for radiological procedures other than portable X-rays but this represents an almost certain weakening of transmission control. Therefore radiology staff must be included in the required staff training.
  7. **Hand-washing:** Frequent and thorough hand-washing is considered vital. See also below.
  8. **Visitors:** I have seen no firm Australian policy decisions on the status of visitors to hospital patients. Australian government advice to patients quarantined at home is that they should not accept visitors, but this does not apply to persons normally living at the same address (but perhaps should).<sup>9</sup> The current CDC advice for hospital visitors is restrictive<sup>10</sup> but does not amount to prohibition (see Box). Any policy should be proportionate to the significance of the epidemic, the virulence of the organism, risk of infection and mortality rates and the level of community immunity, which with this disease is effectively zero. The risks here are amply demonstrated by the rapid spread of cases on the *Diamond Princess* cruise ship, or rapid increase in the “cluster” of cases in Korea<sup>11</sup> in spite of authorities within a sophisticated hospital system being aware of the infection at the outset. This could happen anywhere, including Australia and New Zealand. I therefore believe that a simpler and more effective policy would be *to suspend all visitor privileges* until the Covid-19 patient in question has recovered (assuming he or she is not sharing a room with other infected patients). Social media and smartphone videotelephone ‘apps’ represent a reasonable risk-free alternative. The CDC advice<sup>10</sup> may represent a reasonable starting point for discussion but may not be adequate for Covid-19, which will exploit complacency or a natural unwillingness by decision-makers to avoid otherwise distasteful policies. I note that the advice makes exceptions for visitors of dying patients and children. Though this is understandable, the logic for infection control purposes is debateable. I quote from Wu *et al.*:<sup>3</sup> “...*To possibly succeed, substantial, even draconian measures that limit population mobility should be seriously and immediately considered in affected areas, as should strategies to drastically reduce within-population contact rates through cancellation of mass gatherings, school closures, and instituting work-from-home arrangements, for example.*”

#### **CDC advice for managing visitor access to hospital patients with Covid-19 infection.<sup>7</sup>**

- Establish procedures for monitoring, managing and training visitors.
- Restrict visitors from entering the room of known or suspected Covid-19 patients (i.e., PUI). Alternative mechanisms for patient and visitor interactions, such as video-call applications on cell phones or tablets should be explored. Facilities can consider exceptions based on end-of-life situations or when a visitor is essential for the patient's emotional well-being and care.
- Visitors to patients with known or suspected Covid-19 infection should be scheduled and controlled to allow for:
  - Screening visitors for symptoms of acute respiratory illness before entering the healthcare facility.
  - Facilities should evaluate risk to the health of the visitor (e.g., visitor might have underlying illness putting them at higher risk for Covid-19) and ability to comply with precautions.
  - Facilities should provide instruction, before visitors enter patients' rooms, on hand hygiene, limiting surfaces touched, and use of PPE according to current facility policy while in the patient's room.
  - Facilities should maintain a record (e.g., log book) of all visitors who enter patient rooms.
  - Visitors should not be present during aerosol-generating procedures.
  - Visitors should be instructed to limit their movement within the facility.
  - Exposed visitors (e.g., contact with Covid-19 patient prior to admission) should be advised to report any signs and symptoms of acute illness to their health care provider for a period of at least 14 days after the last known exposure to the sick patient.
- All visitors should follow respiratory hygiene and cough etiquette precautions while in the common areas of the facility.
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Box: Centre for Disease Control (USA) advice for visitors to patients with Covid-19 infection.<sup>10</sup>

9. **Other actions:** Some extreme actions have been taken by some Chinese nurses treating Covid-19 patients. These include head shaving to prevent cross-infection (possibly enforced<sup>12</sup>), on the basis that long hair may carry infective material and impedes donning and removal of PPE.<sup>13</sup> The optimum hair length and frequency of washing/showering needs to be discussed. It seems sensible to prohibit the wearing of any body adornment such as jewelry while on duty, including embedded body decoration.

#### **Support for nursing staff**

Nursing staff will inevitably feel isolated and vulnerable to becoming infected and may be under marked psychological stress. It seems sensible to institute an effective support network, ensure that nurses adopt strict standards of cleanliness and infection control that mandate frequent hand

washing, for example before and after each patient exposure and by the clock, and twice-daily showering including hair washing before and after each shift. A controversial question is whether nursing and other staff should be tested periodically for Covid-19 infection. There is a general assumption that PPE will prevent transmission of infection but the evidence in favour of such optimism is of poor quality and does *not* suggest complete effectiveness, at least for bacterial infections.<sup>14</sup> Therefore, consideration should be given for all exposed staff (medical, nursing and paraclinical staff) to have Covid-19 PCR tests weekly. This suggestion is based on the known minimum incubation period of about 7 days and the capacity for viral spread before symptoms appear. Amendments to the frequency of testing could be made according to results.

#### **Summary**

Nurses will be at the vanguard of treating cases of any Covid-19 arising in Australia or New Zealand. The nature of the infection carries implications for nurse working conditions and personal safety that require to be recognized, and these need to be translated into effective policy. This may involve steps that would normally be considered extreme and unnecessary, such as prohibition of visitors.

**Ethics Approval:** Not required

**Conflicts of interest:** None declared.

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**Disclaimer:** The comments and suggestions made herein are my own, but based on (or extrapolated from) current evidence. I do not have special training in clinical microbiology.

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