Original Study

THE CWM HOSPITAL COVID-19 RESPONSE

Ravi Naidu[1], Nigel McCarley[2], Luke Nasedra[3]

1. Medical Consultant, CWM Hospital. Correspondence email: ravi22naidu@gmail.com
2. Clinical Governance Manager, CWM Hospital
3. Medical Superintendent, CWM Hospital
Note: CWMH – Colonial War Memorial Hospital

SUMMARY

This paper is intended to provide an overview of the Colonial War Memorial Hospital's response to the Covid-19 pandemic in Fiji. It presents the management and organizational systems and processes developed to ensure effective and timely management of potential COVID-19 cases presenting within CWM.

It presents the theoretical model developed to support the Outbreak Management Team in determination of appropriate responses that required to be modified in the light of new knowledge and experience.

The paper describes actions taken to ensure the preparedness of CWM; the development of process algorithms required to ensure consistency across the organization; the establishment of an Emergency Management Centre that provides 24 hour oversight of the CWM Covid-19 response; arrangements for quarantine of staff etc. It will also present the Covid-19 Preparedness Assessment Tool that was developed in CWM and subsequently used to assess the state of preparedness at other facilities nationally.

INTRODUCTION

In December 2019, a series of pneumonia cases of unknown cause emerged in Wuhan, Hubei, China, with clinical presentations greatly resembling viral pneumonia. Deep sequencing analysis from lower respiratory tract samples indicated a novel coronavirus. COVID-19 is transmitted via droplets and fomites during close unprotected contact between an infected person. Airborne spread has not been reported for COVID-19 and it is not believed to be a major driver of transmission. However, it can be spread through the airborne route if certain aerosol-generating procedures are conducted in health care facilities. This is of high risk in the Intensive care setting. (Report of the WHO-China Joint Mission, 16-24 February 2020)

During the initial phase of the outbreak there was a great concern since almost a third of patients in a hospital in Wuhan were health care workers. (Chaolin Huang, 2020). Later the evidence became clearer that majority of the healthcare workers, 88% were from Hubei in the initial outbreak and that health facility transmission was not the driver of the new infections as in SARS cases. (Report of the WHO-China Joint Mission, 16-24 February 2020). However, concern regarding healthcare transmission and the safety of health care workers and patients in the hospital impacted directly on the response plan in CWM where a robust and dynamic approach had to be taken to address the challenges in the Colonial War Memorial hospital.

The Fiji response was multifaceted and was a national response led by Public Health. Health facility preparedness was an important part of COVID 19 preparedness and this had to be done while still maintaining the day to day functions of the hospital. The overall goal of the CWM Hospital strategic preparedness and response plan was (and remains) to stop further transmission of the 2019-nCoV within Fiji and to mitigate the impact of any outbreak. The CWM Outbreak Management Team (already established to address the Measles Outbreak in Fiji) identified the strategic objectives of the CWM Response plan as follows:

• Limit human-to-human transmission, including reducing secondary infections among close contacts and healthcare workers, preventing transmission amplification events, and preventing further international spread from China;

• Identify, isolate, and care for patients early, including providing optimized care for infected patients;

• Identify and reduce transmission from the animal source;

• Address crucial unknowns regarding clinical severity, extent of transmission and infection, treatment options, and accelerate the development of diagnostics, therapeutics, and vaccines;

• Communicate critical risk and event information to all communities, and counter misinformation;

• Minimize social and economic impact through multi-sectoral partnerships.

CWMH

The Colonial War Memorial Hospital (CWMH) is the largest tertiary care hospital in Fiji, providing500-beds serving a local catchment population of over 400,000 people. CWMH manages circa 30,000 admissions per year with the majority of patients in the public health care system. While also acting as the national referral centre for Fiji's other divisional hospitals, CWM provides separate adult, paediatric, maternity and neonatal intensive care units (ICUs), and offers specialty services including cardiology, orthopaedics, plastic surgery, urology and neurosurgery. There is also a 'paying ward' in the hospital.

Typically, the hospital functions on the brink of its surge capacity and, as a consequence, there are daily bed blocks, overcrowding of public spaces and in the Emergency Department.

The COVID pandemic occurred at the tail end of a Pacific measles outbreak that began in late 2019. There had been a large measles outbreak in the Pacific region with cases spread over the Pacific nations. Fiji had a total of 28 cases of measles with 0 deaths and, in contrast, Samoa had 5,707 cases with 83 deaths (WHO/UNICEF, 2020); Fiji's measles outbreak had been focused in the central eastern division and CWM had established measures already in place for identifying and isolating suspected measles cases. (The measles outbreak in Fiji was in significant decline at the time of the Covid-19 pandemic being declared) Although measles is an airborne pathogen and far more contagious than COVID 19, the majority of cases of measles could be treated at home, there is a vaccine available, we had immunoglobulin available. Also, measles pathophysiology has been understood to great detail.

Early in the pandemic it was well established that majority of the patients have mild disease. This understanding facilitated a key tenet of the CWM response plan i.e..stable cases would be managed outside of CWM Hospital by the SORT while the critical and high-risk patients would be admitted to CWM hospital. An admission criterion was adapted from the definitive WHO China report. It was also agreed that Navua hospital would be the isolation facility for stable patients with a suspected/confirmed Covid-19 diagnosis processed through CWM.

The CWM response was developed and managed by the (previously named) Measles Outbreak Management Team that transitioned to the Coronavirus Taskforce, initially meeting two times per day. The Medical Superintendent acted as Chair of the Coronavirus Taskforce. A smaller Incident Management team (IMT) was formed within the hospital and involved in day to day clinical decision making on suspected cases coming into hospital. The CWM IMT worked closely with and complimented an efficient, pre- existing arm of public health, which dealt with the public health response i.e. the Sub Divisional Outbreak Response Team (SORT), which came under The Divisional Outbreak Response Team (DORT). An Emergency Command Centre was also established, providing a 24-hour coordinating mechanism within the hospital.

Although the hospital management and clinical team had developed systems to respond to the Measles epidemic, the nature of the Novel Coronavirus presented numerous challenges. This can be summarized as follows:

- COVID 19 was a completely new pathogen with many unknown facets dictating that clinical management processes were potentially changing daily;
- there was a requirement to increase the number of Intensive Care beds available – a 6 bed Covid ICU was subsequently established
- there was a requirement to make available beds that would be required in the event of a significant increase (a surge) in cases – ultimately a 30 bed Covid Ward was established
- the requirement for Personal Protection Equipment (PPE) increased significantly;
- there was a requirement to urgently identify quarantine facilities for staff in contact with suspected Covid-19 patients
- the rapid escalation to pandemic status created a high level of anxiety amongst health service staff;
- there was a need to restrict routine clinical activities e.g. elective surgery, outpatient clinics etc
- there was a requirement to minimize the number of members of the public in the hospital by reducing visiting time to 1 hour per day and restricting this to a single visitor at any one time

The CWM Clinical Governance Hub (comprising Quality Officers, Infection Prevention and Control Officers and Customer Relations Officers) provided direct support to the Coronavirus Taskforce by providing a dedicated 'COVID-19' telephone that was available 24 hours per day and managed by the Infection Prevention and Control Team. In addition, extensive signage was designed and made available throughout the hospital. The Customer Relations Officers were active at all points of entry to the hospital providing advice direction to visitors regarding the limitation in visiting time/numbers and supervising the hand washing stations established at each point of entry. Recognizing the high level of anxiety among staff, the Head of Infection Prevention and the Infection Prevention and Control staff developed a Covid-19 specific training programme that was subsequently delivered to circa 1,000 staff both within and external to CWMH. The Clinical Governance Hub was also required to develop the process algorithms required to support a cohesive response.

ORGANIZING A PERPAREDNESS RESPONSE – THE KEYSTONE MODEL

The CWM preparedness response was underpinned by the 'Keystone Model' (Fig 1), developed by the CWM clinical governance adviser. The Keystone Model identifies key elements that required to be considered in responding to the pandemic and provided a framework for the structured examination of response requirements. The Keystone Model also allowed for the identification of clear Governance structures whereby a named staff member was made responsible (and accountable) for defined elements of the Keystone Model.

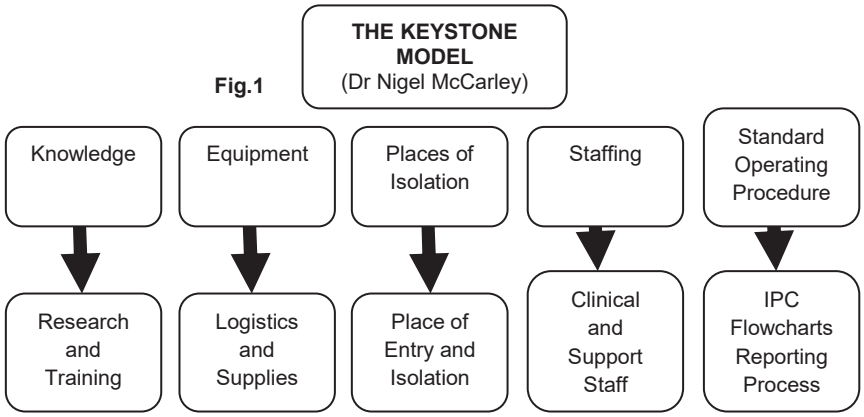

Fig.1

The Keystone Model presents 5 key elements that require to be addressed in establishing an effective response process within the organization.

There were 5 key components which had to be established and refined. The areas were:

- Places of isolation
- Knowledge
- Equipment
- Staffing
- Standard Operating Procedures

Although the 5 elements are not mutually exclusive, for discussion purposes each will be highlighted separately.

1. Places of Isolation:

This primary element considers the CWM response to a patient presenting with a symptom consistent with a potential diagnosis of Covid-19. Recognizing that patients present in areas other than in the Emergency Department, the CWM response plan required the identification of 'places of isolation' at each potential point of entry, where a stringent triage system ensured suspected patients could be identified and channelled for appropriate clinical management.

The following potential points of entry were identified:

- The Emergency Department
- The Paediatrics Department
- The OBGYN Department
- The Eye Department
- The Dental Department
- The Special Out-Patients Department

In summary, each place of entry was required to identify a location within the immediate area that could be designated as a 'place of isolation'. Any person deemed to be a suspected Covid-19 patient on presentation would immediately be located in the 'place of isolation'. The staff attending would refer to the relevant medical officer who would be required to attend to further assess the patient. If the medical officer deemed the patient not to be a 'suspected Covid-19' patient, the patient would be returned to the conventional route of care. However, if a suspected case was confirmed, the patient may be either admitted to CWM (if meeting the case definition/admission criteria) or, if clinically stable, transferred directly to the isolation facility at Navua Hospital. If considered appropriate, the patient may be deemed to be best placed in self-isolation at home. (The management and transfer outside the hospital would be conducted by the Sub-divisional Outbreak Response Team (SORT); this team was responsible for contact tracing and public health interventions).

A generic algorithm for the management of suspected Covid-19 cases was developed and subsequently modified to reflect department-specific requirements e.g. in the dental department and the eye department. (Later, due to emergency measures and lockdowns, the eye and dental department entries were not a major contributor). The relevant algorithm was made available to staff at the point of entry to ensure clarity and consistency in the required response across CWM.

An example of the algorithm (for the Emergency Department) is presented a Figure 2: (end of paper)

2. Knowledge:

It was recognized at the outset that little was known about this new emerging virus and that new knowledge would be quickly produced worldwide. CWM's Head of Infectious Diseases was identified as the key clinician and charged with ensuring that the Taskforce were kept informed of any relevant research and developments that may impact on the management of suspected Covid-19 patients in CWM. Updates were presented to the Coronavirus Taskforce which, in the early stages, was meeting twice daily. (This subsequently reduced to a single daily meeting).This was critical to informing not only the clinical response and management of patients

but also in contributing to addressing the knowledge gap across all disciplines of the hospital.

It was also recognized that, due to the limited knowledge available, there was a very high level of anxiety amongst all groups of staff. In response, a Covid-19 specific-training program was developed with the specific purpose of ensuring staff were kept informed of the emerging evidence and of the systems and processes being established to manage Covid-19 patients. As keeping every staff member informed and mitigating anxiety was a primary objective of the Taskforce, the training sessions were delivered on a daily basis. Each session included a question/answer session with participants given the opportunity to seek additional information and to express any concerns that they had. The training program was delivered to both clinical and non-clinical staff, including the hospital hygiene and maintenance staff. The generic training program was later disseminated to the trainee interns and the medical school teams before resuming on clinical attachment.

Additional training in the proper use of Personal Protective Equipment (PPE) was delivered by the Infection Prevention and Control team. The Infection Prevention and Control team delivered training to 2339 participants; this included the Fiji National University staff and students, The Military and the public health team.

The approach to staff training had to be adapted over time to accommodate restrictions subsequently imposed on numbers of persons attending in any single space.

3. Equipment

A special allocation had to be made of certain equipment. This ranged from monitoring device to ventilators. Each requirement was planned and listed and revisited as our suspected cases started coming in.

In conjunction with equipment the PPE's posed a challenge. A balance between appropriate use and supply had to be maintained. In the initial part of the pandemic, there was a great degree of uncertainty and anxiety. From this stemmed a need to educate the staff and to control and monitor supply of scarce PPEs. The PPEs were controlled strictly by the IPC team.

Reconfiguring service provision to incorporate a dedicated Covid-19 Intensive Care Unit comprising 6 fully equipped ICU beds and a dedicated 30 bed Covid-19 Ward within CWM presented significant challenges both in terms of securing the required equipment and on logistical support.

In addition, as the Coronavirus Taskforce policy was to quarantine all staff in contact with a suspected Covd-19 case (pending a negative test outcome), quarantine facilities required to be identified. Two properties owned by the Government that had been vacant for some time were immediately secured and the hospital maintenance team were tasked to prepare the houses. Dedicated vehicle and drivers for staff transport was arranged and security staff appointed to protect the two properties. (Drivers were given training in the proper use of PPE and protocols for the use of the vehicles agreed.

4. Staffing

The Coronavirus Taskforce was concerned with staff safety and isolation. It was agreed that every staff member coming in contact with a suspected case of Covid-19 would be immediately placed in isolation. The detailed plan for identifying and isolating suspected Covid-19 cases in 'places of isolation' minimised the number of staff: patient contacts and reduced the demand on both nursing and medical resources. Each Head of Department identified a pool of medical and nursing staff that had indicated a willingness to engage in direct patient contact, ensuring that the allocation of staff was managed effectively. This was further complemented by a protocol that was devised that ensured emergency doctors, internal medicine doctors and Intensivists could be brought in as per patient requirements. This ensured that the usual pool of medical staff would not be depleted.

With every healthcare worker/non-clinical staff member that was in contact with a suspected case being quarantined in a designated facility, a significant focus on support of this staff group was maintained. Every effort was made to ensure the quarantine facilities were fit for purpose.

The decentralized model of admitting non severe patients in Navua hospital also ensured that the staff of CWM was not depleted due to quarantine. During scoping of Navua it was noted that there was greater opportunity to house staff and quarantine easily.

5. Standard Operating Procedures

Effective management of Covid-19 patients require the organization to have explicit standard operating procedures (SOP) to ensure the safe delivery of care; consistency in care delivery; common understanding of organizational processes by staff members and the capacity for the proper audit of care delivery processes. In order to ensure these objectives were secured, both within the CWM and across involved facilities, a number of SOPs were developed by the staff of the Clinical Governance Hub.

The SOPs addressed a diverse range of issues such as 'Rational Use of PPE'; 'Infection Prevention and Control for the safe management of a dead body in the context of Covid 19'; 'Infection Prevention and Control on Disinfectant, Laundry and Waste Management', 'Standard Operating Procedures relating to the movement of a patient throughout the Facility that has presented with symptoms that are indicative of a potential Covid-19 patient' and 'Standard operating procedures relating to the reporting on patients with

suspected/confirmed Covid-19 (both inside and outside the organization)'

Many of the SOPs developed in CWM also had National relevance and were adapted for much wider use as appropriate.

CONCLUSION

The effective management of the CWM response was predicated upon cohesive interface between the MHMS Taskforce; The MHMS Implementation Management Team and the CWM Coronavirus Taskforce. The response of the hospital is evolving with the availability of evidence and the evolving epidemiology of the virus. The measures are done keeping in mind that the day to day business of the hospital is not affected. The team at CWM hospital continues to look at ways to look at best evidence and practice which mitigates risk and keeps the resources in mind.

REFERENCES

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Fig. 2: COVID-19 – Emergency Department Flowchart