Preparing For COVID-19 PANDEMIC

Perspectives and Lessons Learnt from the Surgical Department

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COVID-19 has been a greatest leveller of society. Dr Chew has learnt to be grateful for the simple things in life. While he does not take bubble tea, he is excited with the re-opening of McDonalds. He is also very proud of all the enormous sacrifices many healthcare workers have contributed in this war. He wishes everyone well and to stay safe.

Introduction

COVID-19 originated in late December 2019, from Wuhan in Hubei province, China, and has since rapidly spread throughout the planet, resulting in the World Health Organization declaring it an international pandemic on 11 March 2020. At the time of writing this article, over 509,164 people had been infected worldwide with 23,335 deaths (case fatality-rate 4.6%).[1] Currently, there are more than 4,000,000 confirmed cases with over 280,000 deaths (case fatality rate 6.9%).[2, 3]

Singapore confirmed its first case of COVID-19 on 23 January 2020,[4] and local transmission was subsequently reported on 4 February 2020. The Disease Outbreak Response System Condition alert level was raised to Orange on 7 February 2020. When this article was prepared in March, the pace of disease was slow and the milestone of 1,000 infections was crossed more than two months after, with majority due to importations. The epidemic's trajectory, however, surged thereafter with outbreaks noted in foreign worker (FW) dormitories. At the time of writing, there are 23,787 local COVID-19 cases.[5]

Surgical safety has fallen under the spotlight as the pandemic has shifted epicentres from China to Europe and the US. Surgeons are called upon to cancel elective procedures with a focus on maintaining emergency operations and elective cancer surgeries, with additional precautions needed for surgical staff.[6-8]

The surgical department at Sengkang General Hospital (SKH) developed disease outbreak response measures in coordination with hospital administration, the operating theatre management unit (OTMU), nursing staff and other surgical departments. The aims were to ensure that all staff were ready to perform surgery on any positive or suspected COVID-19 cases, to reduce risk of nosocomial infection for the surgical teams and to ensure continuity of care for all surgical patients.

While the hospital measures were being discussed and implemented, some of the key components in the initial phase were focused on managing the individual surgeons.

Task force creation

A department task force (TF) was the first important conceptualisation created. While many departments relied entirely on the head of department (HOD) to organise and implement measures enforced by the hospital administration, there were several benefits in having a TF.

Information gathering and confidence building

In the SARS-CoV 2003 era, information was mainly disseminated through traditional newspaper print and broadcast media such as radio and television mediums. Medical information was also only available via hardcopy journals and thus reporting new advances was slow with a time-lag bias, with a limited reach among medical personnel due to access issues. In the year 2020, the presence of social media and internet availability on all smart devices meant that everyone would be receiving information at the same time. Online medical journals also ensured that quality information from high impact journals were quickly and readily available.

An unpleasant consequence however, was that this information was also available to the general public. As noted from worldwide universal panicked hoarding of food and sanitation essentials by the public with graphic imagery of long queues and fights in supermarkets, it is apparent that fear of the unknown and self-preserving behaviour could rapidly degenerate into chaos. For healthcare workers, reports of death of doctors and a high number of healthcare workers (3.8%, n=1,716 of 44,672)[9] getting infected in China also initially sowed doubts and uncertainty. YouTube videos of overwhelmed hospital staff, family separations and tearful workers went viral and were shared repeatedly, leading to a sense of dread and impending doom.

The TF creation was thus instrumental in sieving much of the data available, determining what the disease behaviour was and what measures were needed for the safety of staff. As collective analysis of the data was done by all members, there was better understanding of the situation, and the corollary effect was that confidence was disseminated among our staff members as well. Having confidence was vital for staff attendance and workforce unity despite the fears of the disease. This effect is still present today. More importantly, a business continuity plan (BCP) within the department could be organised effectively to ensure that work could continue even if a staff member was to be quarantined or infected, with 100% confidence among all staff that everyone was unified in response.

Messaging and communication

The TF consisted of staff across ranks. Messaging and communication within the TF was bi-directional rather than a pure top-down approach. Measures implemented had been discussed with the junior staff, with feedback sought and opinions heard, and changed where necessary. This was important, but managed within a tight bandwidth to avoid laborious and prolonged discussions with delayed conclusions. In the department, discussions were efficiently conducted and conclusions made within 45 to 60 mins. The HOD reserved the right to make the final decision even against popular opinion and consensus, and the TF understood that some of the decisions were made with different considerations in mind.

Moreover, hospital operational instructions were rapidly evolving as the intensity of disease outbreak progressed. Timely and clear dissemination of information to the department was important to avoid confusion or misinterpretation of instructions. In messaging and communication to the entire department, there were several principles adopted:

- All critical information was disseminated via the HOD;
- Information disseminated included explanation of the current international and national

status to give context for the hospital measures;

- Regular briefings were conducted at a paced fashion (once every two weeks) to avoid information fatigue. Frequency would be increased to weekly as the disease outbreak severity worsened;
- Briefings were conducted to all staff regardless of rank;
- TF members would reinforce information and clarify directives to ensure compliance after briefing; and
- 360 degrees feedback was sought from all ranks to ensure all concerns and blind spots were addressed.

Discipline

The best measures planned would be irrelevant if staff attitudes did not view these measures seriously. It was crucial for the senior staff in the department to lead by example. Prior experience in the SARS 2003 outbreak lent weight to the seriousness of this outbreak and none of the measures were criticised by the senior staff. Ensuring senior staff compliance to measures, refraining from spreading rumours and abiding with the leadership of the department were key to a successful implementation. The seniors would also supervise juniors, provide feedback if needed, and monitor staff health and welfare. In this phase, it was also department policy that any positive or suspected COVID-19 cases would only be reviewed and procedures performed by senior staff.

Department discipline also involved compliance with hospital measures of temperature monitoring and all staff were reminded to do so twice daily by administrative staff. Oral digital thermometers were issued to all staff and there were also easily accessible digital forehead thermometers within department offices. All temperatures were electronically recorded and entered into a hospital server; web-based forms were created to facilitate ease of entry using personal smartphones. The hospital had also issued individual radio-frequency identification tags to track movement within the hospital setting. This would simplify contact tracing if there were staff exposure to COVID-19 patients. Staff were reminded to carry tags while on duty, and those who developed a fever or respiratory symptoms were screened and advised to only seek medical consultation within the hospital staff clinic. Travel advisories and leave policies were adhered to strictly.

Staff preparation

PPE and PAPR training

A hospital-wide mask fitting and refresher of personal protective equipment (PPE) donning and doffing was conducted by staff from Infection Control. Refresher training for the use and maintenance of the powered air-purifying respirator (PAPR) by educators from the Department of Occupational and Environmental Medicine was also provided to all staff. In our institution, all healthcare workers were mask fitted with the PAPR CleanSpace® HALO™ (CleanSpace Technology Pty Ltd, Artarmon, NSW, Australia). All surgeons and junior staff completed training within one week.

Full dress rehearsals (FDR)

SKH has a purposeful built operating room (OR) with a negative pressure environment designated as an isolation OR. This is in contrast to the standard OR with positive pressure relative to the surrounding air. The isolation OR reduces dissemination

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of the virus beyond the OR. A unique COVID-19 workflow and protocol was designed by the OTMU team. A FDR was first conducted by the HOD, and two cases on real patients with consent – an elective surgical procedure and endoscopy – were used to confirm the workflow. All members of the surgical team then did a physical walkthrough of the isolation OR to ensure familiarity of surroundings as surgery on infectious cases are not routinely performed. FDRs were subsequently conducted by every consultant and associate consultant over the following two to three weeks to reinforce workflows and ensure familiarity.

BCP

Staff segregation

These were done on two tiers. At the first tier, senior staff were advised on segregation between the tertiary hospital (Singapore General Hospital) and our hospital. This was to reduce cross infection between hospitals and also ensured that there was no confusion in adhering to institution workflows, policies and guidelines. Surgical procedures that had been pre-booked were allowed to proceed but non-essential clinic services were suspended or transferred over to the tertiary hospital specialists for follow-up care.

For the second tier, the department developed a "hot" and "cold" team concept. The risk assessment matrix

determined that inpatients were the highest risk. Thus, the hot team was designated to handle all acute admissions and to perform ward rounds on elective patients that were post-surgery. The cold team was assigned to the specialist outpatient clinics. There were two subsets (team A and team B) of hot teams that handled the emergency roster. These include the comprehensive coverage of acute admission, trauma, bleeder and endoscopic retrograde cholangiopancreatography. It was also decided that a seven-day hot and seven-day cold format would be implemented with overall team swapping after each seven-day cycle. There were several planning rationales to this:

- All surgical staff had undergone the necessary PPE training and were expected to have minimal breaches that needed quarantine.
- There was a need for manpower to be deployed to high need areas in the event there was a spike of cases (eg, ICU or the emergency department).
- A 14-day cycle was felt to potentially lead to fatigue and burnout, which could lead to PPE breaches. Hence a seven-day work cycle was preferred.
- In the event a hot team subset was exposed and needed quarantine, the cold team subset would replace the duties (ie, hot team A replaced by cold team A). The hot team would then undergo risk matrix assessment as per hospital policy, and be quarantined and undergo testing till given clearance by hospital administration to return to active duty.

In addition, all large-scale meetings were cancelled and department education programmes, such as mortality rounds, tumour boards and journal clubs, were to be confined within the hot or cold teams. All medical students, foreign fellow attachments and observerships were also cancelled.

Reduction in elective work

Elective work is defined as elective surgeries, elective endoscopies and outpatient specialist clinics. There were several planning considerations to determine the extent of reduction in elective work:

- Based on our initial hot/cold team divisions, there would be a reduction of manpower.
- There was a need to anticipate a possible increase in admissions from COVID-19 cases requiring ward, high dependency or ICU beds.

For elective surgery, all cancer cases and any benign cases that were symptomatic or had justifiable indications were to proceed. Clinic and endoscopy cases were also reduced.

Preparation

Task Force Creation

1. Information gathering and confidence building
2. Messaging and communication
3. Discipline

Staff Preparation

1. PPE and PAPR training
2. Full dress rehearsals

Business Continuity Plan

1. Staff segregation
2. Reduction in elective work

Conclusion

The COVID-19 pandemic battle affects all healthcare workers. There are multiple considerations in how a surgical unit functions and the phases of planning will require hard decisions, strong leadership and decisive communication. It is prudent to maintain a robust BCP to ensure that surgical patients receive quality care especially during this difficult time, and to reduce any compromise in care as best as possible. ◆

Information is accurate as of time of writing

Legend

1. Elbow bump and thumbs up. Individuals, departments, whole of Singapore prepared for COVID-19 war!

2. Step by step visual aids to remind donning and doffing protocols. In PPE and stress, such reminders are important to avoid mistakes and contamination

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