



Pharmacists in COVID-19 Pandemic

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At the frontline in NCID

Since the outbreak of COVID-19 in Singapore, the National Centre for Infectious Diseases (NCID) has been at the forefront of this battle. Tan Tock Seng Hospital (TTSH) has also been ramping up the outbreak response at NCID. Let's find out how the pharmacy team at TTSH/NCID has been faring thus far.

Senior management at TTSH and NCID were notified on a potential viral outbreak in Wuhan, China at the start of the year. Since 2nd January 2020, urgent meetings were set up for screening and disease management plans to be made. Evidently, years of contingency planning such as outbreak drills, tabletop exercises are now put to good use. On 23rd January 2020, the first COVID-19 patient in Singapore was diagnosed, and this marked the start of the disruption



to the daily routines of many locals.

This is a challenging time not only for doctors and nurses, but also for pharmacy staff. From the procurement and supply of medications, to patient management and collaboration with other healthcare professionals on research

guidelines development, pharmacy has contributed greatly. Let's take a look at the activities at various sections of NCID, namely the screening centre (SC), inpatient wards, outpatient clinics as well as special precaution area (SPA) and how pharmacists have contributed.

"Even though we have to be in full PPE throughout the shift and wear the marks of N95 masks and goggles after shift, all of us are still willing to work at the screening centre. We are truly grateful to the volunteers from different hospitals and departments."

— SC staff

Screening centre

Majority of the COVID-19 suspects will undergo routine nasal/throat swabs and chest X-rays at the SC. Doctors may then decide to send a selected group of patients



Pharmacy staff and volunteers diligently carrying out their duties in full PPE

At the frontline in NCID cont'd

Screening centre cont'd

home while awaiting the swab results. If the COVID-19 suspects who were sent home turned out to be positive for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), ambulances would be dispatched to bring them back to NCID. Meanwhile at the SC pharmacies, staff are dressed in full personal protective equipment (PPE) while processing and dispensing medications. Each staff also carries a real time location system tag for the purpose of contact tracing.

At SC, “fast and furious” is what most people will use to describe the working environment as the goal is to review patients as fast as possible, for more to be screened. Hence, effective communication is key in this fast-paced environment to ensure safety and efficiency. To help reduce calls to doctors for prescription intervention, the pharmacy staff collaborated with doctors to create a standardised set of prepacked medications for quicker dispensing, and it is informally referred to as “the Happy Meal :)”.

Inpatient wards

Specialising in the management of infectious outbreaks, NCID is well-equipped with isolation rooms, negative pressured (NEP) rooms and a high-level isolation unit. These rooms are single-bedded, but can be scaled up to twice their capacities when needed. Those who test positive, or are likely suspects with symptoms will be admitted to the NEP rooms.

During this pandemic, inpatient pharmacists made some modifications to their daily routines. Instead of going into the NEP rooms with full PPE, medication reconciliation is conducted over the phone. They faced multiple challenges due to the ever-changing nature of the outbreak and varying patients' profiles. Language was perhaps the greatest barrier experienced when they had to verify medications, drug allergies and vaccination history in a foreign tongue. At one

point, the wards were labelled as “international wards” due to the large number of imported cases from multiple countries such as Hungary and Turkey. At times, communication aids such as pictograms and Google Translate were also used.

Furthermore, inpatient pharmacists would monitor patients who were prescribed with drugs that could potentially treat COVID-19, namely lopinavir/ritonavir, interferon-beta, hydroxychloroquine and tocilizumab. Treatment guidelines were constantly updated in collaboration with Infectious Diseases (ID) doctors and then, disseminated nationally. Some pharmacists were also involved in the clinical trials led by the ID doctors. With the help of Drug Information Services, findings from various clinical trials or observations on the use of any re-purposed medications for the treatment of COVID-19 were also collated.

Outpatient clinic and special precaution area



Morale boosting to ensure that staff's welfare are well taken care of while they give their best to care for patients
(Photos taken prior to the implementation of social distancing measures)

The outpatient daily workload has been gradually ramped down to cope with the essential services at SPA for the follow-up of COVID-19 patients or suspect cases. The SPA serves as a mini-version of SC. Normally, SPA is used by patients who have contagious infections that are highly transmissible (i.e. airborne particles, droplets or contact). Donning of full PPE is also required when handling patients seen in SPA. As for the outpatient pharmacy, it continues to provide home delivery services to patients whose appointments had to be postponed, and drug adherence clinic services for patients with HIV.



Last but not least, the unsung heroes from the procurement team play a crucial role. They work tirelessly for long hours daily (including weekends) to ensure that medication supply is both sufficient and easily accessible for the whole campus (TTSH and NCID).

“Despite all the challenges, fears, anxiety and tiredness, all of us continue to persist on with the ‘We will All get Through this Together’ Kampong spirit. We greatly appreciate the support that senior management and the various departments have given us and this assures us that we are not alone in this fight!”

— NCID Pharmacy Team

Four months have passed and the war against COVID-19 is still ongoing. While many of the initial challenges have now become the new norm,

language barrier remains an obstacle when managing patients who do not speak English or local dialects. However, this a great opportunity to

demonstrate one’s adaptability and flexibility as workflows, protocols, and admission and discharge criteria are constantly changing. What was applicable last week may not be applicable today. Nobody knows when this ‘marathon’ will end and having adequate rest is important. For that, the Wellness Department has come up with many initiatives to boost staff’s mental and physical health, while the hospital’s senior management actively encourages staff to take small breaks in between shifts.

Thank you NCID pharmacists Ms Law Hwa Lin and Ms Ong Ying Ying who contributed to this article

ICU — the last line of defence

The intensive care units (ICUs) are the last line of defence for COVID-19 patients who are in critical condition. Ng Teng Fong General Hospital (NTFGH) critical care pharmacists share what it is like caring for COVID-19 patients in the ICUs.

In the combat against COVID-19, pharmacists play a vital role in critical care. Pharmacists respond promptly to medication queries from clinicians and nurses, allowing the team to focus on patient care and carry out their duties safely and efficiently. Pharmacists also serve as a reliable resource of drug information and support the medical teams by facilitating their work in various ways.

Firstly, storage of frequently used medications was shifted to the ICUs to improve access. Secondly, medication administration timings were streamlined, in consultation with pharmacy, to reduce the frequency at which nurses enter isolation rooms, and this also helps conserve PPE supply. Thirdly, amidst global supply chain disruptions, apart from ensuring timely supply of medications, pharmacists

have an even greater role in optimising medication use and minimising wastage. Last but not least, pharmacists are also involved in the ramp up plans to cater to the surge in demand for ICU beds, by looking into the corresponding demand for medications and ensuring sufficient stock levels of such medications.

As critical care pharmacists, it is also important to stay abreast of new

studies on potential COVID-19 therapies and to evaluate the findings with the clinicians. Given that most studies were conducted in Europe and the United States, pharmacists need to evaluate the applicability in the local context before using it on patients. As new information on COVID-19 surfaces, pharmacists as part of the multi-disciplinary team continuously revise their clinical approach to the care of COVID-19 patients in the ICUs.



Mr Joel Chiang (far right) with the team of critical care pharmacists in NTFGH
(Photo taken prior to the implementation of social distancing measures)

Thank you NTFGH critical care pharmacist Mr Joel Chiang who contributed to this article

Safeguarding Singapore's medication supply amidst global supply chain disruptions

Our store and procurement teams have been working tirelessly behind the scenes to safeguard Singapore's medication supply amidst global supply chain disruptions. We invited ALPS procurement pharmacist, Ms Christina Ng, from Changi General Hospital (CGH) to share her experience with us.

Most of the active pharmaceutical ingredients and medications in Singapore are imported from other countries in Asia, Europe and the United States. As more countries close their borders to prevent the spread of COVID-19, the global supply chain is disrupted and Singapore faces potential shortages.

The Ministry of Health (MOH), Chief Pharmacist Office, Pharmacy managers and ALPS procurement pharmacists are working closely with pharmaceutical companies to mitigate potential shortages and ensure continuity in medication supply. To circumvent the medication supply issues, several strategies have been employed.

Firstly, pharmacies in various hospitals increased their stockpile of medications by ramping up their orders with existing vendors, while simultaneously sourcing for alternative vendors. With a larger stockpile, storage space is now a concern and several areas within the hospitals had to be re-designated as storage space. Secondly, the procurement pharmacists had to collate a list of vendors for



"It is a dynamic situation as the COVID-19 pandemic unfolds. Every day brings new challenges but we do our best to implement measures to safeguard medication supply for all our patients, as we have their best interests at heart."

— Christina (Procurement pharmacist)

Left to right: Ms Christina Ng, CGH Pharmacy Store Team in action (Photos taken prior to the implementation of social distancing measures)

submission to MOH and remind vendors to get themselves registered with the Ministry of Trade and Industry to ensure continuity of operations during the Circuit Breaker period. Thirdly, alternatives for medications facing potential shortages were also sought after discussion with fellow pharmacists and doctors. Lastly, restrictions were placed on the quantity of medications that each patient can purchase to prevent hoarding and unnecessary wastage.

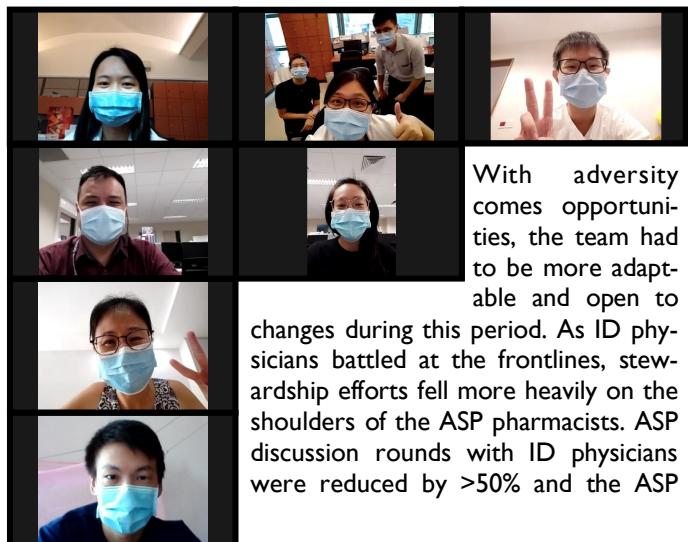
Thank you CGH procurement pharmacist Ms Christina Ng who contributed to this article

Antimicrobial Stewardship must go on!

Ensuring the judicious use of antimicrobials is challenging and all the more important during this pandemic. It is a continuous effort that should not be neglected. While PPE and life-saving medications experience global shortages and treatment clinical trials are underway, Antimicrobial Stewardship Programme (ASP) pharmacists are behind-the-scenes making sure that antimicrobials are used appropriately for all patients at all times. The ASP team from TTSH gives us an insight.

Broad-spectrum antibiotics such as piperacillin-tazobactam, meropenem and ciprofloxacin are reviewed

daily to ensure that they are indicated and are initiated on the appropriate dose, frequency and duration. The ASP team actively screens cases for early intravenous to oral conversion of antibiotics, de-escalation from broad-spectrum antibiotics and cessation of antibiotics in accordance to evidence-based guidelines. These everyday interventions become more important when there is an active need to conserve medications and reduce wastages of key antibiotics. In line with this, the ASP team continues to work closely with prescribers. Regular messages to improve and promote appropriate antibiotic use are planned to be disseminated regularly.



With adversity comes opportunities, the team had to be more adaptable and open to

changes during this period. As ID physicians battled at the frontlines, stewardship efforts fell more heavily on the shoulders of the ASP pharmacists. ASP discussion rounds with ID physicians were reduced by >50% and the ASP

pharmacists have been working more independently. Daily workflow and review strategies were improvised as the ASP team took on additional roles such as supporting COVID-19 clinical drug trials. The ASP pharmacists have also been coordinating with the Pharmacy and Therapeutics secretariat and pharmacy procurement and supply chain colleagues to provide advice on alternative antimicrobials that can be used if there are potential supply disruptions of antimicrobial agents.

This COVID-19 battle is likely to go on for some time and the ASP team is ready to adapt and approach new challenges to ensure that all patients receive appropriate antimicrobial therapy.

Thank you TTSH ASP pharmacists Mr Heng Shi Thong and Ms Yap Min Yi who contributed to this article

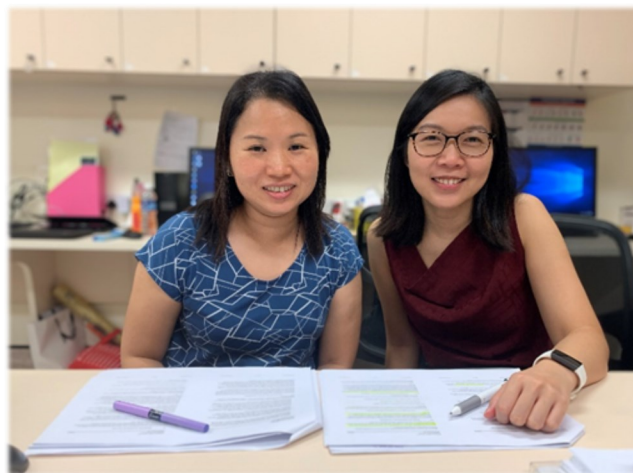
Clinical trials on COVID-19

To win our fight against COVID-19, the race to search for an effective treatment is on around the world. At National University Hospital (NUH), two separate clinical trials for moderate and severe COVID-19 infections are in progress for remdesivir. We have Ms Chen Hui Hiong, a clinical trial (CT) pharmacist in NUH, to share more with us.

How would you describe the role of a CT pharmacist?

The role of a CT pharmacist is multifaceted and it requires one to apply knowledge ranging from logistic planning, research to pharmacotherapy. When the investigational product is a new drug, it brings even more excitement to the job. The responsibilities of a CT pharmacist include looking through the drug's investigational brochure (which can be hundreds of pages) to be familiarised with the pharmacodynamic properties, pharmacokinetic profile, administration details, adverse effects and interactions. One must also be well-acquainted with the clinical trial protocol, its criteria, medications prohibited, as well as the optimal (and often strict) window of administration.

Having such knowledge place the CT pharmacist in the best position to address any drug enquiries that the study team may have. In addition, one also needs to anticipate questions and scenarios that may arise out of the ordinary, and brings them forth for discussion with the study team or pharmaceutical companies in order to be better prepared. Throughout each clinical trial, a lot of coordination and teamwork is required with other group members such as research coordinators, trial investigators, along with clinical research associates and project managers from the pharmaceutical companies. Overall, the role is exciting and enjoyable, unlike what others may imagine it to be.



Left to right: Ms Chen Hui Hiong and Ms Joy Yong
(Photo taken prior to the implementation of social distancing measures)

What challenges have the COVID-19 pandemic brought on to your role?

"The greatest challenge is to stay focused and engaged in the midst of the onslaught of new information and evidence which are emerging. We always have to be prepared for changes, and this includes having to constantly distill the new information we get before applying to our daily practice. But I am glad to have a good team of colleagues who are always willing to share their information and knowledge on COVID-19 management, as well as the banter/critique on the latest evidence."

— Hui Hiong (CT pharmacist)

Thank you NUH CT pharmacists Ms Chen Hui Hiong and Ms Joy Yong who contributed to this article

Medication delivery service - time is of the essence!

Many patients had non-urgent clinic appointments rescheduled to comply with Circuit Breaker measures. To ensure that patients have sufficient medications until their rescheduled appointments, Singapore General Hospital (SGH) Pharmacy will deliver the medications to them. This led to a surge in the demand for medication delivery service (MDS). SGH MDS team shares what it takes to step up to the challenge.



MDS allows patients to fill their prescriptions and have their medications delivered directly to their home or any preferred location in Singapore. Patients simply have to submit their prescriptions and schedule a delivery in-person or via a phone call, email or the Health Buddy mobile application. Pharmacists in the MDS team oversee daily operations. They ensure efficient allocation of resources, answer enquiries on billing and medications, collaborate with physicians and nurses, and liaise

with courier companies to ensure timely delivery and proper storage of medications during delivery. MDS team pharmacists also continue to review and optimise patients' medication therapies, and when necessary, they would call patients to counsel on any new medications or changes. On the other hand, pharmacy technicians are involved in every step of the process from taking patient orders, packing medications into parcels, to billing and ensuring parcels are ready for dispatch.

The MDS team had to cope with an increase in delivery orders, from 2500 per month to upwards of 500 per day! They also dealt with increased requests from patients for specific delivery timings or same-day deliveries and put in extra hours and weekends to fulfill the orders. Additionally, they assisted with getting top-up prescriptions by contacting the clinics or physicians out of concern for patients. The team truly went the extra mile for patients!



To accommodate the changes, specialist outpatient clinic pharmacy at level one was closed to expand the MDS working and storage space. The team adapted quickly and looked into workload and manpower distribution to accommodate the increased workload and staff shortages due to redeployment or mandatory leaves. Work processes were refined to optimise sorting of delivery parcels and coordination with courier companies. New work instructions were also developed to minimise infection risk for partner courier companies.

(Left) Clockwise from top left: Part of the waiting area previously used for dispensing was converted to MDS work area, shelves full of MDS orders, prescriptions and bill summaries, parcels packed into boxes ready for pick-up by courier company.

(Bottom) SGH MDS team

(Photo taken prior to the implementation of social distancing measures)



"You are in the good hands of the MDS team!"

At the end of it all, pharmacists and pharmacy technicians of the MDS team ensure that patients receive their medications in a timely and worry-free manner.

*Thank you SGH MDS team who contributed to this article:
Pharmacists Mr Ong Kheng Yong, Mr Hwang Yi Kun, Ms Clara Eudora Cheah
Pharmacy Technicians Ms Su Su Thinn, Ms Divya Shakuntala D/O Ananthan*

You are NOT ALONE in the fight against COVID-19!

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#SGUnited, Together We Can Overcome!

"I'm a pharmacist who works in a public hospital heavily affected by COVID-19. Today I would like to share with you some of the efforts of my pharmacy colleagues during this trying time. For those of you who have no idea what a pharmacist does, or who think you do, please read on.

First, let's begin with Community Pharmacies such as Guardian, Watsons and Unity who were first hit by the COVID-19 effect. They fended off hundreds who came on a daily basis to demand for masks and sanitisers that simply weren't available, dealt with enquiries and panic from the public on a virus that wasn't well researched at that time and yet had to keep calm about their own fears. **To my friends in the community, thank you for being the first defenders, hang in there!**



From the start of the year, pharmacists were planning what we can do to effectively tide through COVID-19. When NCID sent out an urgent call for volunteers to run the new pharmacy for potential COVID-19 patients over the Chinese New Year period, many pharmacists and technicians volunteered their services. These colleagues don full PPE for hours, work overnight and eat lukewarm meals. They also had to **quickly familiarise themselves with all kinds of terms in various languages to find out from patients about their past medications or allergies.** If you've ever spoken to your grandparents about their medications, you'd have known that they probably describe them as the small white round pill without knowing what they are for. Now try doing that with a foreigner, who has no idea what his medications are for and in a language you don't understand LOL **(most!! intense!! guessing!! game!! ever!!)** Guess wrong, and the patient could break out into rashes, or... die. Kudos to our pharmacists who do this on a daily basis in their wards with 40+ patients, not just during COVID-19, but EVERYDAY. Thank you!!!



Just today, Singapore has the highest spike in COVID-19 cases, and that means the need to **MAKE SPACE** in the wards ... patients who are relatively stable would be "decanted" to off-site facilities such as community hospitals while other patients are "discharged" much faster than before. Pharmacists had to battle with the rapid transfers as **every patient's medications needs to be reviewed for accuracy, safety and efficacy prior to transfer and a new bag of medications needs to be prepared.** To those fighting to decant our patients safely, thank you!!



As more data on COVID-19 surfaces, pharmacists scour medical journals for evidence on new treatment options, summarise the information for medical teams, make recommendations on doses in accordance to patients' renal and liver function and **help review the safety and efficacy of potential COVID-19 therapies.** You may have seen news on medications that need to be avoided (e.g. ibuprofen) from unverified sources...well pharmacists have a role in helping to debunk that too! We study the mechanisms behind interactions, rationalise if such things are possible, justify them if they are and we do this everyday!

Behind the scenes, as more countries close their borders, our **procurement pharmacists fight battles daily to ensure we have enough medications to tide through however long this crisis may last.** While you worry whether you can bake your cake tonight with all the flour gone from the shelves, our pharmacists worry that in time, patients in pain will not get their opioids or those with heart attack or stroke won't have blood thinners because we don't have any to spare. Pharmacists are also looking at data on how we can prolong the use of each vial of medication so that we can conserve it for the future, but all these have their limits. And this is why, we need you to be understanding that we cannot give you 6 months of medications now. **We can only give you**

what you need, because we NEED TO ENSURE THERE IS ENOUGH for other patients (seems like a recurrent theme from our supermarkets and government ... Please lah, tolong don't hoard...).

Your family members may have had their appointments rescheduled, so what about their medications? **Home delivery services have been extended to all patients**, you don't even have to contact us first, we trace the patients that need a top up, and call YOU instead. This has increased the workload significantly! With healthcare, it's not like your Taobao delivery. If pharmacies deliver the wrong medications to the wrong patient, that's a nightmare. Explaining medications to a patient who is xxx km away from you who does not know what you are talking about is nearly impossible. This has increased the time we take to do things significantly! But pharmacists remain patient, remain calm, and keep going. Because that is the professionalism we continue to show as a healthcare professional.

I know many of us in the pharmacy profession often feel forgotten, but seeing how dynamic our profession is during times of crisis, I hope this is a good reminder of why we serve. There are so many roles of pharmacists which I have not been able to share, because I am not the best person to, but to our researchers, regulatory pharmacists, IT pharmacists, and so many more, thank you. For all of us (even other healthcare professionals too!) who feel you are not directly at Screening Centre, NCID, TTSH, etc. - **no matter what, be proud to call yourself a COVID-19 frontliner, because you are. Each one of us is necessary to keep this healthcare system going. Stay positive, stay motivated, we are in this for the long run."**

– Adapted from NUSWhispers post on 9 April, check out <https://www.nuswhispers.com/confession/80916> for the whole story

Thank you Ms Azrina Imran Tan for allowing PSS Hospital Chapter to share her story!



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