



COVID-19 Infection Control and Prevention Strategies for Health-System Pharmacists and Pharmacy Departments

**Hospital and Clinical Pharmacy Section,
Federation of Asian Pharmaceutical Associations (FAPA)**

April 10, 2020. 1st edition

Background

In light of the emerging COVID-19 pandemic, health-related organizations worldwide are drawing infection control contingency plans and guidelines, aiming to reduce the transmission within each facility and maintain the functional health care system. For the protection of pharmacists and maintenance of functional pharmacy services, the Section of Hospital and Clinical Pharmacy of FAPA, is issuing this recommendation for all health-system pharmacy departments, with international guidelines, the guideline drafted by the Taiwan Society of Health System Pharmacists, and practice principles of several pharmacy departments in Taiwan as references. This is an interim recommendation that may subject to change according to the latest evidence and development of the epidemic.

I. Infection control Strategies

1. Formation of taskforce: in compliance with the infection control policy of the institution, participate in institution-wide emergency preparedness and management committee, and participate in the development of the institutional plan and join the periodical meetings. Appoint taskforce members to draw up infection control plans and ensure the adherence, delegate individual work and responsibility.
2. Draw up the pharmacy department COVID-19 contingency plan: appointed personnel for updates, information release and broadcast, development of educational training. Protocols including staff management, medication inventory and infection control supplies management, dispensing workflow, clinical pharmacy services and staff training.
3. Staffing strategies comply with department contingency plan: Considering the core mission of the hospital, setting the priority of pharmaceutical services. Mobilize the ambulatory staff to back up in-patient pharmacy first, clinical/administrative staff as the second-line backup resource.
4. Draw up plans such as alternative working places, remote working, split shifts, pre-emptive cross-training, and prepare backup files, to reduce the number of staff working together and to maintain the critical pharmacy roles and essential services, in case of certain member/team absences or quarantined. Delegate the work rationally to avoid potential burnouts.
5. Ensure a sufficient supply of essential medicine and personal protective equipment (PPE): Maximize the use of non-PPE dependent controls such as transparent barriers, physical distancing, telemedicine, drive-thrus, mail order, home delivery, etc..
6. Public affairs and communications:
 - A. Ensure all staff to be well informed on institutional and department plans. Channel all public communications through the designated spokesperson.
 - B. Releasing and communication of policies regarding the epidemic management: Easy access to real-time/updated information.

II. Personnel management

1. Applicable to full-time/part-time pharmacist, administrative employee, technician, contracted worker, intern pharmacy student, guest/visitors
2. Health monitoring: daily health monitoring of all staff, establish the reporting protocol for sickness and status of personal leaves. Staff with underlying immune disorders should avoid providing care or services to suspected/confirmed COVID-19 patients.
 - A. Body temperature measurements

- a. Measure body temperature daily before entering the working area, keep the record for any abnormalities (forehead temperature $\geq 37.5^{\circ}\text{C}$, ear temperature $\geq 38^{\circ}\text{C}$, or any discomfort should be notified to the supervisor immediately and seek medical attention as advised).
 - b. Daily status report by each division to the institution for any abnormalities regarding staffs' health condition before getting off duty.
 - c. Assigned personnel to maintain and update the body temperature measurement log system.
 - d. Visitors and non-employees must have their body temperature measured and perform hand hygiene (by using alcohol-based hand rub with 60-95% alcohol or washing hands with soap and water for at least 20 seconds) before entering the pharmacy department.
- B. TOCC (Travel history, occupation, contact history, cluster) check: perform TOCC check for all personnel entering the department. Staff should inform the supervisor if they have a family member who had travel history within the past 14 days, and perform health surveillance on body temperature and respiratory symptoms daily during the time period of their families in home isolation.
 - C. Establish a standard reporting system and managing protocol for staff who feels unwell, esp. symptoms such as fever, cough, shortness of breath, and breathing difficulties
 - D. Mental health and wellbeing for pharmacy staff: maintain good interpersonal relationships, keep a positive and optimistic attitude, enhance the immune system with a sufficient amount of sleep, well-balanced diet, and exercise. Seek professional help and consultation if needed.
3. Personal protective measures
- A. Wear facial masks: wear a facial mask (surgical mask or N95, in correspondence to one's risk of exposure) at all times in the facility and during work.
 - B. Perform hand hygiene: wash hands with soap and water before and after work. Do not touch eyes, nose or mouth with one's hands.
 - C. Social distancing. Consider using barriers during meals, avoid gatherings and talking.
 - D. No loitering after work.
 - E. Disinfect hands and desk after contacted with or delivering documents and paperwork.
 - F. Press with elevator buttons with appropriate tools instead of your finger. Machines for public use should be disinfected routinely, such as elevator buttons, door knobs, and water dispensers. Perform hand hygiene after touching such surfaces.

- G. Removal of PPE should be done according to the CDC guided protocol. Perform hand hygiene immediately after, and dispose of the used PPE as medical disposals.
 - H. In shortage of standard PPE, follow the national or the institutional recommendation to remodel and optimize personal protective devices.
4. Suggested precautions to avoid COVID-19 transmission and minimize the potential risk of exposure for staff family members:
 - A. For those who drive to work, perform hand hygiene before and after driving.
 - B. For those who use public transports, have hand rubs with you, and wash your hands when getting home.
 - C. Avoid physical contact with family members before changing clothes, washing hands, disinfect your glasses and cellphones or taking a shower. Cleaning the exposed body surfaces such as face, neck, wrists and hands first if shower can not be done.
 - D. Treat the changed clothes as potentially contaminated items, place and wash them independently (separated from others' clothes).
 - E. Disinfect the home environment periodically (including countertops, doorknobs, light switches, remote controls, computers, etc.).
 5. Staff personal leave and travel restrictions and management: perform in compliance with guidelines issued by the CDC, ministry of education and your institution. Students/interns should report and apply for taking personal leaves to supervisors and the department of medical education in advance.
 6. Contingency plans for potential understaffed situation: check all essential workflow, update emergency contact list, backup staffing list, and the timeline for pre-emptive personnel cross-training to maintain functional core operation.
 7. Access control: Listing of all visitors for further management if needed.
 - A. Strict access control of each working area. Entries are prohibited for non-employees and visitors except for business reasons.
 - B. Visitors or pharmaceutical suppliers should perform hand hygiene, wear facemasks. Pharmacy staff should confirm their identity, check TOCC and allow entry only if complied with institutional regulations.
 - C. The pharmacy warehouse only opens to pharmaceutical deliveries with appointments made in advance. Coordinate the delivery time of pharmaceutical suppliers into a designated period of time.
 - D. Courier for personal packages should make the delivery outside of the pharmacy.

III. Medication inventory and infection control supplies management

1. Principles: Keep updated about the supplies, no hoarding and have a contingency plan for shortages.
2. Essential medicine management: general survey on suppliers, check inventory, adjust order frequency and quantity.
 - A. Example of managing strategies in Taiwan: According to the “Principles of drug supply and management during COVID-19 epidemic” issued by Taiwan Food and Drug Administration (TFDA), health care facilities or pharmacies should make drug purchases according to the quantity used same time (month) in the previous year. If purchases or actual clinical need exceeds 10% of the quantity, reasons and supporting documents should be submitted to TFDA for purchase approval.
 - B. Pharmaceutical suppliers’ inventory check and emergent delivery protocol: Survey on pharmaceutical manufacturers’ inventory and manufacturing capacity. Ensure a sufficient inventory of essential drugs and COVID-19 epidemic patient care drugs for at least 8 weeks of use. Develop a strategy to cope with related shortages.
3. Epidemic related treatment medication/personal protective equipment/disinfectants supply and management
 - A. Prepare sufficient personal protective equipment (facemasks, goggles, gowns, etc.) and infection control assisting items (forehead thermometers, alcohol-based hand rub, etc.). Ensure a sufficient supply of high concentration (>60%) alcohol.
 - B. Facemasks: assigned person to manage the inventory, keep record of use. For interns and pharmacy students performing clinical work, limited use with one mask per person per day.
 - C. High concentration alcohol/alcohol-based hand rub: managed by the pharmacy warehouse, keep record of each division’s use.
4. Be familiar with the protocol of the national drug shortage reporting system. Comply with central government survey on epidemic patient care medication inventory. Evaluation of pharmaceutical suppliers’ capacity and initiate the backup plans for alternative drug substitution when necessary.
5. Regulations on off-label use of potential therapeutic agents (such as hydroxychloroquine, azithromycin, ivermectin) for COVID-19 and self-purchase medications are needed, to ensure medication supply for indicated patients.
 - A. Careful and thorough evaluation needs to be performed before off-label use of medications, close monitor on efficacy and potential side effects during and after use. Off-label used medications or potential therapeutic agents for COVID-19 should be prioritized for in-patients, deem as temporarily inappropriate for

self-purchase, and with limitations on duration of use.

- B. For potential therapeutic agents to treat COVID-19 or medication currently in shortages, be aware of any attempt to stockpile without indication. Educate and provide correct concepts and information for the public.
- 6. Ensure an undisrupted medication therapy for patients: measures such as adjusting and extending the maximum dispensed days of prescription medications, mailing medications to patients, etc. should be considered in compliance with your national and institutional regulations.
- 7. To minimize the potential risk of exposure for patients during visiting hospitals, prescription release to community pharmacies should be encouraged during the epidemic. Measures to reduce the time of waiting or gathering such as express counters or out-door pick-up counters could be considered. Ensure the measures comply with the principles of Good Dispensing Practice.

IV. Environment/working area infection control

- 1. Provide infection control policy and information for patients and visitors at the entrance of each division, to remind all to comply with measures such as wearing facemasks and perform hand hygiene before entering the pharmacy department. Have alcohol-based hand rubs available at entrances. Visitors should leave as soon as possible, no loitering.
- 2. COVID-19 can be transmitted via respiratory droplets and direct contact, thus the pharmacy department should carry out cleaning and disinfection guidelines for the environment, items, and device disinfection. Ensure air circulation, utilize air cleaners. Open windows if necessary.
- 3. Utilized bulletins, floor markings and barriers to minimize physical contacts, and maintain a suitable social distance (as recommended by the national epidemic command center).
- 4. Environmental disinfection: starting with low-risk areas first and the high-risk areas later (i.e. clean the areas restricted for staff only first, and then the areas where visitors could be).
- 5. Disinfectants should be used according to the manufacturer's instruction, including methods of dilution, minimum time of engagement, etc. For example, prepare a bucket of 500 ppm bleach or 100-300 ppm hypochlorous acid solution daily for environmental disinfection, areas where multiple people may have contact frequently, such as door handles, delivery counters, and countertops, should be wiped every two hours. Wear gloves while using the disinfectants. Cleaning tools should be disinfected and keep dry after use. Replace cleaning tools such as mops and cloths often.

6. Medication carts should be disinfected of all surfaces after the daily exchange, including the handles of each patient drawer. Daily disinfection should also be performed for hazardous drug delivery cart.
7. Public areas cleaning and disinfection:
 - A. Each pharmacy and offices: appoint designated personnel to clean and disinfect daily, including the benches, countertops and office desks, emphasizing on door handles, water dispensers, light switches, touch screens, and elevator buttons, etc.. Disinfect desktops before and after having meals.
 - B. Personal working space: disinfect as needed, at least once a day (including door handles, desktops, phones, keyboards, etc.).
 - C. Meeting rooms: the meeting organizer is responsible for the disinfection before and after a meeting, including desktops, microphones, computer equipment (mouses and keyboards), etc.
 - D. Materials and objects intended for public use (such as file folders, keys, etc.) should be disinfected periodically.
8. Containers and transfer equipment for medication delivery for the isolated and non-isolated area should be separated and disinfected as needed. Use fax or e-mail instead of hard-copies for information communication between the isolated and non-isolated areas. Hard-copy documents (such as prescriptions) of isolated areas should be disinfected and sealed in an independent container.
9. Perform rehearsals of disinfection protocol for a confirmed COVID-19 personnel identified at each working area.
10. For confirmed COVID-19 patients, medications should be packed in paper or plastic bags individually for delivery. Notify the nursing station that medication carts and drawers are not to be placed within the quarantined area. Un-used medication should be packed in plastic bags and stored until the end of the expected virus survival period and disinfected before returning to the pharmacy.
[Note: After aerosolization, viable SARS-CoV-2 virus was detectable throughout the 3-hour experiment. The virus was detectable after 72 hours after application to plastic and after 48 hours on stainless steel. Survival was shorter on cardboard (after 24 hours) and copper surfaces (4 hours)].
11. Potentially contaminated items/disposals: set up independent containers to collect used PPEs such as masks and gloves. Disinfect and seal to avoid secondary contamination.

V. Clinical pharmacy services

1. Principles: Strengthen the exposure risk management by minimizing contacts between multiple service areas. Keep appropriate distance with patients. Follow self-

protection principles. Perform hand hygiene with hand rub after leaving a service area, and wash hands with water and soap when returning to the personal workplace. Avoid touching your eyes, nose, and mouth with unwashed hands.

2. Joining of physician clinics
 - A. Staggered appointments to avoid patient gathering.
 - B. In escalated outbreaks, discontinue clinic joining services. Provide consultation via telephone. Utilized communication tools such as Facetime (iOS), Google Duo (Android), Line, Skype, etc. according to your need.
3. Pharmacist-ran clinics
 - A. Staggered appointments to avoid patient gathering.
 - B. Ask patients to wear facemasks and perform hand hygiene before services.
 - C. Perform TOCC inquiries.
 - D. If a patient is having a fever, do not provide clinic service and refer the patient to the fever screening station of your institution.
 - E. If a patient had no fever nor having respiratory symptoms, but with contact or traveling history, clinic service can be provided with the patient wearing a facemask and performing self-health management as regulated.
 - F. If a patient had only respiratory symptoms, without fever or TOCC, clinic service can be provided.
 - G. In escalated outbreaks, evaluate the necessity of the service and risk level. Consider discontinuing the clinic services. Provide consultation and patient follow-up via telephone.
4. Inpatient ward rounds
 - A. Intensive care units/ isolation wards: Enter the ward only when necessary and with personal protection equipment according to the ward's regulations (such as N95 respirators or gowns), keep appropriate distance with patients
 - B. In escalated outbreaks, evaluate the necessity of the service and risk level. Consider discontinuing ward rounds services and provide medication evaluation through the hospital information system (HIS) and communicate with other health care professionals via telephone.
5. Bed-side patient education
 - A. Ask the patient to wear a facemask. Perform hand hygiene before and after educational services. Consider wearing gloves if potential contact with multiple patients.
 - B. In escalated outbreaks, evaluate the necessity of the service and risk level. Consider discontinuing the bed-side patient education services. Provide service via telephone. For special formulations operation instructions, such as inhalers and insulin injections, demonstrate with visual chatting software such as

Facetime (iOS), Google Duo (Android), Line, Skype, etc.

6. Inter-professional meetings/ pharmacist consultations: In escalated outbreaks, evaluate the necessity of the service and risk level and consider discontinuing services. Provide medication evaluation through the hospital information system (HIS) and communicate with other health care professionals via telephone. Utilize video conferencing software such as Zoom, GoToMeeting, Cisco WebEx, etc. according to your needs.
7. Drug information services
 - A. Maintain sufficient manpower for usual operation.
 - B. Maintain a platform or a communication channel to inform all staff on the latest status of the epidemic, guidelines, and regulations.
 - C. Out-patient consultation services:
 - a. Follow self-protection principles. Perform hand hygiene before and after. Use educational videos for inhalers and insulin injections demonstration.
 - b. In escalated outbreaks, discontinue out-patient consultation services. Provide medication consultation via telephone or visual communication tools such as Facetime (iOS), Google Duo (Android), Line and Skype, etc. according to your needs.

VI. Educational program

1. Develop education and training programs for all staff on all aspects of COVID-19 (including etiology, epidemiologies, manifestations, communicability or transmissibility, treatment and pharmacists' role in the epidemic management), as well as infection prevention and control measures, social distancing practices, and PPE use. All staff should be routinely monitored to ensure adherence to infection control and social distancing measures. Staff members should be encouraged to remind each other to adhere to good practices in these measures.
2. Provide education materials in correspondence to the type of work and exposure risk of each staff:
 - A. High risk: staff who provides direct patient care to suspected/confirmed COVID-19 cases.
 - B. Moderate risk: staff who provides direct patient care.
 - C. Low risk: staff without direct contact with patients, such as inventory managing personnel.
3. Utilize technologies and tools such as Zoom, GoToMeeting, Cisco WebEx, etc. to conduct meetings or training courses through video conferencing.
4. Cancel or postpone non-essential large meetings. For essential meetings, participants should be seated for at least 1 meter away from each other (or as

guided by the Center for Disease Control). Limit the duration of meetings to less than 1 hour.

5. PGY training activities:
 - A. Maintain all dispensing trainings
 - B. Clinical pharmacy training: communication between trainees and the preceptor should be done through telephone or email. Written reports instead of oral reports.
 - C. Routine meetings for PGY performance evaluations that involved more than 3 participants should be canceled or postponed. Patient safety-related evaluations (such as Mini-CEX) should be postponed (considering the status of the epidemic), or conduct with simulated patients.
6. Students/interns training:
 - A. Preceptors should ensure that students and interns adhere to epidemic related measures.
 - B. Inform the education program leader immediately for any student with fever or feeling unwell. Assist to seek medical attention and comply with government regulations on self-isolation or quarantine.
 - C. If the preceptor is caring for a confirmed COVID-19 patient, students/interns should not enter the negative pressure/isolation ward.
 - D. In escalated outbreak or when necessary,
 - a. Split and isolate students/interns into different groups. Use separate lunge, stop rotation and have students stay with the current training site.
 - b. Wear PPE according to risk assessment. Use HIS and written reports for clinical pharmacy skills education. Consider canceling all clinical ward round teaching and clinic joinings.
7. If necessary, cancel all domestic or foreign pharmacist and pharmacy student trainings.

VII. Protocol for suspected/confirmed COVID-19 case of a pharmacy staff

1. Notify the supervisor and the institution immediately. Isolations and quarantines for contacted personnel as regulated by the institution and CDC.
2. Initiate the contingency plan and workflow: discontinue non-essential pharmacy services and initiate the backup staffing plans. Separate and split shifts into the minimum required staff to maintain key pharmacy roles.
3. Staff should inform the supervisor if they have a family member who is a suspected or confirmed COVID-19 case, and follow the regulations of the CDC.
4. Disinfect the contaminated/suspected contaminated area immediately.

5. Potentially contaminated drugs: pack and seal with a plastic bag and stored until the end of the expected virus survival period, and disinfect before use.
6. Pharmacy workflow adjustments:
 - A. Dispensing: maintenance of in-patient dispensing as the priority. For staff rearrangements, close up or decreased the number of ambulatory dispensing counters. For in-patient dispensing, dispense multiple days of medications instead of the daily exchange of medication carts may be considered.
 - B. Clinical pharmacy services: adjust and consider discontinuing services according to risk assessment, essential pharmacy priorities and staffing conditions.
 - C. Meetings and educational courses: cancel, postpone or use the video-conferencing tools.

IX. Inter-facility, international pharmacy professionals backup/supporting practice (considering the legitimacy in each country) may be considered according to the status of the epidemic.

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