

SARS-CoV-2 Infection:

Expert Consensus on Guidance and Prevention and Control

Strategies for Retail Pharmacy Workforce

(1st Edition)

Part I: Knowledge on SARS-CoV-2

1. Epidemiological Characteristics

The outbreak of acute respiratory disease at the end of 2019 was named by the World Health Organization as Coronavirus Disease 2019, referred to as COVID-19^[1]. The pathogen is highly related to the coronavirus that causes SARS, so it was named SARS-CoV-2^[2]. The National Health Commission of the People's Republic of China has designated COVID-19 as a Class B infectious disease, which is managed according to Class A^[3]. At present, the epidemiological understanding of SARS-CoV-2 is affected by the change of epidemic situation, hence there is no complete and definite knowledge about it. Human populations are thought to be generally susceptible to SARS-CoV-2^[4]. The elderly and those with underlying diseases usually are having more severe problem after infection, and children and infants are also affected^[5]. The incubation period is 1-14 days, mostly 3-7 days based on the current epidemiological investigation^[6].

2. Route of Transmission

- Close person-to-person contact (around 6 inches/ 1.8 meters) is the most common route of transmission;
- Human-to-human transmission occurs primarily through respiratory droplets produced when an infected person coughs or sneezes, similar to the spread of influenza and other respiratory pathogens;
- These droplets may fall into the mouth, nose or eyes of a nearby person, or may be inhaled into the lungs;

- There is no clear evidence as to whether a person can get infected with SARS-CoV-2 by touching surfaces or objects (contaminants) with the virus and then touching his or her mouth, nose, or eyes. Generally, for most respiratory viruses, people with the most severe symptoms are considered to be the most contagious [7]. However, for SARS-CoV-2, it has been reported that the routes of transmission range from asymptomatic infection to close contact [8,9].

Part II: Characteristics of Retail Pharmacies

1. Responsibilities of Retail Pharmacy

The retail pharmacy, with great development potential, has become an indispensable and important part of the public health system. The functions of retail pharmacy are changing from traditional simple drug sales to the high-level provision of pharmaceutical care. In addition to ensuring the supply of drugs needed by the market, the functions of the retail pharmacies are shifting more to health education, and collaborative management with hospitals in community health care [10].

2. Characteristics of Retail Pharmacies

Retail pharmacy is the most basic pharmaceutical care unit. Compared with a medical institution, it has features of a large number, wide-coverage, and high convenience. When the epidemic comes, the pharmacy takes the crucial responsibility of protecting the people's health in the grass-roots community.

- Severe working pressure. In addition to ensuring the supply of daily medicine in the community, the pharmacy should also actively stock the protective materials and drugs against the epidemic;
- High risk of infection. The pharmacy has a large flow of individuals, a large density of persons when purchasing materials in shortage, and a large number of hidden infections;
- Lacking of medical protection. Once there is an outbreak, the pharmacy cannot

get medical assistance in the first place;

- Insufficient understanding of epidemic situation and prevention. The pharmacy is lacking systematic health supervision and knowledge dissemination access;

Part III: Risks for Retail Pharmacy

Under the situation of the COVID-19 epidemic, the staff of retail pharmacy are always at the front line, not only providing the public with drugs and protective supplies, patient consultation, publicity, and education, but also facing many risks.

1. Insufficient Training ^[11]

Comprehensive and timely training of epidemic prevention and control knowledge is an important means for retail pharmacy staff to obtain epidemic information, learn protection knowledge, and master the epidemic prevention and control process.

Insufficient training will lead to the following:

- Weak awareness of personnel protection;
- Irregular operating procedures;
- Delay in reporting of suspected cases;
- Poorly management of medical waste;
- Increase of occupational exposure risk;
- Possible omitted reporting of cases, even spread of the outbreak.

2. Shortage of Protective Equipment

In the epidemic situation, protective equipment such as masks and protective clothing are "strategic materials", which are related to the safety of all people's lives. However, due to various reasons of production, procurement, logistics, etc., shortages of protective materials have generally occurred, which will lead to the following situations:

- Serious exacerbation of occupational exposure risks and direct threat to the safety of front-line workers;
- Ripple effects such as a monopoly in the supply chain, lack of manpower,

and insufficient public protection;

- Social instability ^[12].

3. Mental Issues

With the spreading of the virus and the increased number of confirmed cases, the daily work routine has been broken. The retail pharmacy staff is at the forefront of the community, with a large amount of people contact, which can easily cause mental problems such as anxiety and fear:

- Shortage of workforce and continuous high-intensity work cause huge physical and psychological burdens;
- Shortage of protective equipment that is unable to guarantee staff safety and market supply, exacerbates panic;
- Epidemic prevention and control require upgrading, but some customers do not understand, cooperate, or even have a bad attitude;
- Staff is prone to negative emotions such as fear, sadness, depression, heavy mood, low mood, and even over-sensitivity, irritability, and excessive behavior ^[13].

4. Occupational Exposure

Occupational exposure risks for retail pharmacy staff can be ranked as high, medium, and low risks based on the location the pharmacy and job position in the pharmacy.

- High risk: work contents include contact with patients with fever, cough, etc., or exposure to operating positions contaminated by patient's body fluids; retail pharmacies in areas with severe epidemic, or in areas where confirmed cases are distributed;
- Moderate risk: work contents include direct contact with customers, such as pharmacists, salespersons, cashiers, etc., retail pharmacies in areas with case reported;
- Low risk: work contents include indirect contact with patients, such as accounting, scheduling, decoction etc., retail pharmacies in areas with no case reports.

5. Environmental Pollution

The characteristics of retail pharmacies determine that they have a high risk of environmental exposure. Employees who are exposed to such environments for a long term will inevitably increase the risk of infection, such as:

- Small space
- Poor ventilation
- Messy items
- Massive flow of people
- Panic purchasing
- Open workplace

High-risk places for retail pharmacy:

- Washbasin
- Clutter area such as counters

6. Disinfectant Supplies Reserve

Proper cleaning and sterilizing of environmental surfaces is the basis for reducing the incidence of infections ^[14], but the followings are currently common situations in retail pharmacies:

- Lack of the storage of sterilizing supplies and equipment;
- Areas and items are not regularly sterilized as required;
- Risk of cross-infection when staff is exposed to various items.

7. Waste Exposure

Irregular management of medical waste will lead to the wanton spread of the virus and the outbreak of the epidemic. The irregular actions mainly include:

- Open waste storage;
- Waste placed in living area/work area;
- Wastes discard without recycling, sterilizing as required ^[15,16].

Part IV: Prevention and Control Strategies and Work Guidance

for Retail Pharmacy

1. Set up an Emergency Response Control Team

During the epidemic period, retail pharmacies should set up the emergency response control team under the unified leadership of the local health and epidemic prevention department, mainly responsible for:

- Developing emergency plans and workflow;
- Daily management during the epidemic period;
- Ensuring that employees perform their duties effectively;
- Ensuring the effective implementation of infection prevention in pharmacy;
- Reporting the relevant information on the epidemic situation regularly according to the corresponding requirements of the local health and epidemic prevention department.

2. Prevention and Control Knowledge Training

Full staff training ^[16] should be performed on epidemic prevention and control by referring to domestic and foreign authoritative guidelines ^[3,4,9,12,13,18-22], which can be in the form of, but not limited to, online courses, group discussions and simulation exercises. Training contents include:

- Disease knowledge and epidemic distribution
- Workplace disinfection process
- Personal protection knowledge
- Infection prevention and control
- Waste management
- Suspected case identification
- Information reporting process
- Mental health education

3. Whole Process Protection of Staff

3.1 Preparation for work

- Correctly wear disposable medical masks on the way to work;

- Try to commute by walking, cycling or private car and avoid public transportation ^[18];
- Do not communicate with irrelevant persons to reduce the possibility of droplet transmission;
- Minimal touch to public facilities;
- Avoid touching the nose, mouth, or eyes with unsterilized sites to avoid infection with viruses;
- Perform proper hand hygiene after arriving;
- Use 75% alcohol or disinfectant wipes to wipe keys, mobile phones and other items in time;
- Change personal clothing.

3.2 During the work

- Wear work clothes throughout the work with a closed neckline;
- Wear a disposable round hat, medical-surgical mask, and gloves;
- Keep a distance of more than 1 m from others (1.5 meters in heavily infected areas);
- Raise awareness of frequent handwashing ^[9]. Proper handwashing should be performed when removing protective equipment, before eating, before and after using the toilet, to reduce the chance of virus infection.

3.3 End of work

- Remove the mask before entering home and place it in a prepared and sealable plastic bag or trash;
- Clean hands immediately after entering the house, sterilize door handles, keys, mobile phones, and other items, and hang clothes to a ventilated place. It is recommended to have contact with family members after a shower.

4. Customer Protection Management

- The body temperature monitoring point should be set up. Before entering the pharmacy, customers need to be checked for their temperature using a non-contact infrared electronic thermometer and reminded to wear masks;
- Staff should guide customers in a timely manner to avoid the crowd in the

store, remind customers to maintain a safe distance of at least 1 meter, and, if necessary, sterilize the items carried by customers with 75% alcohol to reduce the risk of infection;

- In areas where sales of antipyretic, cough, cold, and antibiotic drugs are not restricted, customers need to register their identity information when purchasing such drugs. The staff should report to the local health and epidemic prevention department daily;
- Remind customers to respond to the epidemic situation rationally, and don't fall for rumors. Misuse of drugs cannot prevent SARS-CoV-2, instead, abuse of drugs at high doses may cause adverse reactions.

5. Psychological Protection Management ^[13,23-24]

- During the epidemic, staff members are under great psychological pressure. They can express anxiety by talking, writing a diary, painting, etc.;
- Establish a good interpersonal relationship, and maintain a positive and optimistic attitude;
- Ensure adequate sleep, balanced diet and nutrition, to strengthen immunity;
- Actively monitor the body temperature and respiratory symptoms daily;
- Exercise properly and relax;
- If the negative emotions cannot be adjusted by yourself, it is necessary to seek help from professional mental health institutions and receive psychological counseling in time.

6. Disposal of Suspected Infected Customer

- Identification: If the customer has symptoms such as fever ($\geq 37.3^{\circ}\text{C}$), cough or dyspnea, and/or has recent travel history in the epidemic area or history of contact with infected people, they may be suspected to be infected and should be given close attention;
- Assessment: People with symptoms who have no travel history or contact history, are the low suspected group. Those without symptoms who have travel history or contact history are the moderate suspected group. Those with both

symptoms and travel history or contact history are the high suspected group [25].

- **Prevention:** Once the suspected infection person is identified, the staff should first make sure that their protective measures are appropriate and keep a distance from the suspected person, and evacuate other customers;
- **Registration:** The staff should record the information of the suspect, including name, gender, age, symptoms, contact information, etc.;
- **Disposal:** For low suspects, take preventive measures, such as wearing masks, and provide evidence-based information and recommendations; For moderate suspects, take preventive measures, recommend home isolation for 1 day, and track contact history; For high suspects, immediately contact the local health and epidemic prevention department [9,26], and transfer them to the designated hospital as soon as possible while ensuring the safety of the transfer [5];
- **Sterilization:** after the suspects leave, all items and surroundings in the room should be cleaned and sterilized.

7. Article Sterilization Management [27]

Table 1. Common sterilization methods for retail pharmacy

Classification	Example	Sterilization methods*
Surface of items in public area	phone, computer keyboard, mouse, stationery, cash register, balance, table and chair, door handle, etc.	wipe the surface for sterilization with 75% alcohol or 5000 mg/L peracetic acid every 2 h
Medical instrument **	forehead thermometer, ear thermometer, etc.	wipe for sterilization with 75% alcohol after each use, and sterilize immediately if there is contamination
Large facilities	surfaces of large facilities such as air conditioners, shelves, counters, refrigerators, lockers, etc.	Wipe for sterilization with 5000 mg/L peracetic acid or 500 mg/L chlorine-containing disinfectant once a day

Work clothes	work clothes, work pants, etc.	Sterilize twice a week (replace immediately when contaminated) by hot washing method, sterilize at 75°C for more than 30min or at 80°C for more than 10mins (the sterilization time can be extended according to the degree of dirt); Or with clothing disinfectant (250-500 mg/L chlorine-containing disinfectant can be used for white clothes) for 30 min, rinse with water repeatedly
Cleaning utensils	mop, rag, etc.	Should be dedicated to the special area, rinse with water after each use, soak and sterilize with 500 mg/L chlorine-containing disinfectant for 30min, rinse again with water and then dry

* The disinfectants and consumables used should meet the management requirements of the National Health Commission of the People's Republic of China.

** It is recommended that retail pharmacy during the epidemic should not provide services such as measuring blood pressure and blood sugar.

8. Environmental Sterilization Management ^[28-32]

Table 2. Environmental sterilization methods for retail pharmacy

Classification	Example	Sterilization methods*
Daily air sterilization	Strengthen air circulation	Window ventilation or mechanical ventilation for more than 30min twice a day
	Air sterilization	Circulating air sterilization equipment is used when poor air quality, no good ventilation, or when people are in the room
		When no air sterilization equipment, according to the "Specifications of cleaning and disinfecting for central air conditioning ventilation system in public buildings" (WS/T396-2012), regularly clean and sterilize the air conditioning and ventilation systems
	UV sterilization	Periodic UV sterilization for more than 30min once or twice a day when no one is in the room
Spray sterilization	When no air sterilization equipment, 500 mg/L chlorine-containing disinfectant or 5000 mg/L peracetic acid is sprayed to sterilize, the spray volume is 20-30 mL/m ³ , doors and windows should be closed during sterilization, ventilation should be done for more than 1h after	

	sterilization
Sterilization of floors, walls, elevators, etc.	When there are visible pollutants, first use disposable absorbent materials to completely remove the pollutants before sterilization
	<ul style="list-style-type: none"> • When there are no obvious pollutants, 500-1000 mg/L chlorine-containing disinfectant or 1000 mg/L peracetic acid should be sprayed or wiped to sterilize, once or twice a day • The ground is sterilized first by spraying or wiping from outside to inside, and the spray volume is 200-300 mL/m². After the indoor sterilization is completed, the spraying is repeated from inside to outside again
Precautions	<ul style="list-style-type: none"> • Read the instructions carefully before use, and choose the sterilization method and time, and disinfectant concentration based on the actual use • Pay attention to personal protection when preparing for use, wear gloves and goggles as the disinfectant is toxic and irritating • Scrub with water after sterilization to prevent damage to the items due to the causticity of disinfectants • Cleaning tools, including mops and rags, should be dedicated to the special area, and reusable items soaked and disinfected with chlorine-containing disinfectant should be rinsed with water and kept dried • Chlorhexidine does not inactivate SARS-CoV-2

* The disinfectants and consumables used should meet the management requirements of the National Health Commission of the People's Republic of China.

9. Disinfectants Reserve

Management ^[33]

- Disinfectants should be stored in a special area, sealed, protected from light, ventilated, shaded, no vibration, and impact. It should be kept away from fire, heat sources, equipment that easily generates sparks, and should be kept out of the reach of children.
- Avoid using glass containers for storage, pay attention to whether the containers are damaged, and provide emergency equipment and containers for leakage.
- Alcohol and chlorine-containing disinfectants must be stored separately. Peracetic acid must be stored separately from reducing agents, alkalis, and metal salts.
- Alcohol and peracetic acid should be stored in a place equipped with fire

fighting equipment and facilities (such as sand, dry chemical fire extinguishers, spades, buckets, etc.).

10. Waste Management

The staff should do a good job in the disposal and recycling of protective equipment to effectively avoid secondary pollution. It is recommended to add a special container to collect discarded masks/gloves, throw discarded masks/gloves directly into garbage bags, spray and sterilize with 500mg/L chlorine-containing disinfectant, seal them in sealed bags and discard when there is no disinfectant. The sealed bags and garbage bags should be marked with "discarded masks/gloves" [34-35].

11. Information Management

Realize information sharing and online convenience services, improve work efficiency, maximize the protection of patients' medications need, and reduce the risk of infection when patients purchase medications in stores.

- Establish an interconnected and information management platform to share information such as drug catalogs, drug storage, and patients' needs in different retail pharmacies.
- Establish a linkage mechanism for information sharing with the community to keep abreast of the epidemic situation and release prevention and control supplies and medications in a timely manner.
- Establish an online convenience service information platform for online medication consultation and sales through the pharmacy's official website or App, WeChat official account, telephone, email, etc.

12. Optimize Business Model

During the epidemic period, the retail pharmacy should minimize promotional activities, promote online sales models, encourage electronic payment, and set up 24-hour automatic medicine purchasing machines to avoid overcrowding and reduce the risk of virus transmission.

Part V. Prevention of Legal Risks for Retail Pharmacy

With the outbreak of COVID-19, the retail pharmacy providing pharmaceutical care and epidemic prevention materials to the society should be subject to the supervision of relevant legislations and local departments. The staff should ensure professional behaviors not be affected by the epidemic situation and avoid relevant legal risks.

1. Prevention on Quality Risk of Epidemic Prevention Materials

The retail pharmacy provides the public with safe and reliable epidemic prevention and control items.

- All epidemic prevention materials must have full qualifications of production and business, and the inspection reports must show a qualified result;
- Epidemic prevention materials must not be shoddy because of a shortage of supplies.

2. Prevention on Market Order Risk

In the process of epidemic prevention and control, the government should play a regulatory role, and retail pharmacy must abide by the government's management.

- Should not control market prices;
- Mark the price clearly;
- The price is reasonable, and appropriate profits are earned;
- Publish the commodity price and price increase information regularly;
- Do not hoard at a huge number of scarce goods to cause market shortages;
- If it is really necessary to increase the price, legal evidence must be retained;
- Firmly and promptly implement the price of local government intervention.

3. Prevention on Pharmacy Sales Mode Risk

- Retail pharmacy marketing should not follow false rumors during the epidemic, spread unreliable information, exaggerate the effects of falsehoods, to promote economic benefits. Refuse to spread rumors;
- Strengthen the scientific and legal awareness of retail pharmacy staff;
- Strengthen the social responsibility of retail pharmacy staff;

- Learn scientific and correct knowledge of epidemic prevention;
- Disseminate correct pharmaceutical knowledge and help the masses to prevent epidemic diseases correctly and scientifically.

4. Prevention on Public Order Risks

Retail pharmacy and their staff should be subject to national epidemic prevention management.

- Implement national epidemic prevention measures and abide by scientific protection;
- Properly educate and guide consumers with scientific information and protection methods;
- For customers who do not obey the epidemic prevention, retail pharmacy staff should communicate with them actively and deal with it friendly. If the communication is invalid, inform the relevant department or call the police promptly.

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