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Recommendations and guidance for providing pharmaceutical care services during COVID-19 pandemic: A China perspective

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**Title:**

**Recommendations and Guidance for Providing Pharmaceutical Care Services during COVID-19 Pandemic: The Role of Community Pharmacists**

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1 **ABSTRACT:**

2 **Background** The novel coronavirus pneumonia (COVID-19), which was first detected in Wuhan  
3 City, has now become a pandemic that affecting patients around the world. Particularly, the  
4 community patient population are at high risk of infection and are facing potential failure of  
5 proper medication use during the pandemic.

6 **Objective** To discuss community pharmacists' role and the content of pharmaceutical care (PC)  
7 during the novel coronavirus pandemic to promote effective prevention and control and safe drug  
8 use of the community patient population.

9 **Method** Collect and summarize the experience Chinese community pharmacies gained from  
10 providing pharmacy services during the COVID-19 outbreak, and taking the PC needs into  
11 consideration, analyze and discuss the methods and strategies that community pharmacies and  
12 pharmacists shall use to provide PC during the pandemic.

13 **Results** Community pharmacy management teams shall support PC services by providing  
14 adequate supply of COVID-19 related medications and preventative products, following  
15 environment regulations, and providing sufficient staff trainings. Pharmacists shall use various  
16 approaches to provide PC services in drug dispensing, consulting and referrals, chronic disease  
17 management, safe use of infusions, patient education, home care guidance and psychological  
18 support to promote the COVID-19 pandemic control and ensure safe medication use of  
19 community patients during the pandemic.

20 **Conclusion** PC services in communities during the COVID-19 shall possess different properties  
21 due to disease characteristics and related patients' need. Community pharmacies shall work as a  
22 strong supporter of patient's medication and protective equipment supply. Community  
23 pharmacists shall be prepared to provide skilled and effective PC services for community patient  
24 population to ensure medication safety and promote the overall COVID-19 pandemic control.

25

26

27 In December, 2019, the first case of novel coronavirus pneumonia (COVID-19) was detected in  
28 Wuhan of Hubei Province in China, which then lead to a nationwide epidemic outbreak. On  
29 January 31<sup>st</sup> of 2020, the World Health Organization (WHO) declared the SARS-CoV-2 epidemic  
30 as a “public health emergencies of international concern”. At present, confirmed COVID-19  
31 cases have been reported in many countries including Europe, North America, Oceania, Africa  
32 and Asia, and WHO has characterized it as a pandemic on March 11<sup>th</sup>. It is clear that the  
33 COVID-19 pandemic has become a public health event that needs worldwide attention and  
34 collaboration.

35 SARS-CoV-2 is a novel beta coronavirus with unknown causal agent. At present, it is primarily  
36 transmitted from human-to-human through respiratory droplets and close contact. The  
37 COVID-19 has an incubation period of 1-14 days before the onset of symptoms, and  
38 asymptomatic patients can also be a course of infection<sup>[1-3]</sup>. These characteristics of COVID-19  
39 indicates the importance and urgency of preventing “community transmission” in the overall  
40 pandemic control. As the most accessible healthcare professionals, community pharmacists can  
41 play a significant role in infectious disease control and prevention. As the first country to  
42 experience national outbreak, community pharmacies in China has accumulated valuable  
43 experience in not only COVID-19 control and prevention but also meeting other  
44 pharmacy-related needs of the community patient population.

45 In this article, we summarized the experience of Chinese community pharmacies and  
46 pharmacists in providing pharmacy services during this pandemic, and analyzed the community  
47 PC model of other countries and the needs of PC of the community patient population. The  
48 purpose of this article is to analyze and discuss the methods and strategies community  
49 pharmacies shall use to provide PC during the COVID-19 pandemic.

## 50 **1. Community pharmacy service and the special needs of community patient population** 51 **during the COVID-19 pandemic**

### 52 **2.1 The Definition of community pharmacy**

53 Before discussing the pharmacy services available in Chinese community pharmacies, the  
54 definition of community pharmacy needs to be clarified first. In many countries, including the  
55 United States, England, Canada, etc., the definition of community pharmacy includes both retail  
56 pharmacies that mainly consist of chain pharmacies and outpatient pharmacies located in primary  
57 care clinics that considered as part of the primary care system. In addition to dispensing  
58 prescription medications and providing related pharmacy services, these pharmacies also have  
59 over-the-counter medications, supplements and other healthcare related products and devices for  
60 sale.

61 In China, however, the concept of community pharmacy refers to pharmacies and pharmacy  
62 departments located in primary care institutions only, such as community health service centers  
63 and community outpatient clinics. They follow the regulations of local and national government,  
64 and provide prescription medications dispensing service and other pharmacy-related services.  
65 Retail pharmacies in China provide some prescription medications, over-the-counter medications,  
66 supplements, and health-related products and devices for sale. They are not considered part of  
67 the healthcare system as they practice follow different companies' regulations. The professional  
68 skills of pharmacy staff and pharmacists work in these retail pharmacies varies significantly, and  
69 are generally not considered as healthcare professionals<sup>[4]</sup>.

## 70 **2.2 Special needs of PC services during the COVID-19 pandemic**

71 During the COVID-19 pandemic, the need of PC services is beyond the scope of traditional  
72 practice of community pharmacists, which can be divided into two parts: the need of pandemic  
73 prevention and control and the need from patients of pharmacy-related issues. To promote the  
74 pandemic control, community patients need to be screened properly and suspected patients shall  
75 be referred to designated medical institutions in a timely manner<sup>[5]</sup>. The public also need to  
76 master effective personal protection skills to control the community transmission of COVID-19  
77 <sup>[2, 6-7]</sup>. Patients on medical isolated observation or patients with mild COVID-19 on treatment at  
78 home are lacking guidance on home care strategies<sup>[8]</sup>.

79 The pharmacy-related needs of community patients have similarities with the traditional patient  
80 population, but with different emphasis. For example, when providing consulting services to  
81 community patients, instead of focusing on medications as usual, their questions are mainly on  
82 the scientific prevention knowledge and basic information about COVID-19, such as mask  
83 selection and typical signs and symptoms of COVID-19. For chronic disease patients, especially  
84 those in communities under quarantine, drug supply and patients' compliance are facing a greater  
85 challenge, though the safety and effectiveness of treatment is also important for this patient  
86 population. Thus, community pharmacists shall learn to switch gears when needed from  
87 providing professional knowledge on medication use only to fulfilling community patients'  
88 various needs.

## 89 **2.3 Community PC services and the value of Chinese experience in COVID-19 pandemic** 90 **control**

91 Since the concept of PC being defined in the 1990s, the scope of pharmacy practice has  
92 expanded from medication dispensing to a variety of clinical services<sup>[9]</sup>. Community  
93 pharmacists are considered the most accessible health care professionals to the public<sup>[10-11]</sup> and  
94 the communication bridge connecting physicians and patients<sup>[12-14]</sup>. A scoping review published

95 in 2012 suggested that community pharmacists has provided a wide range of clinical services in  
96 the public health area, primarily on smoking cessation, health eating and lifestyle changes,  
97 infection control and prevention, promoting cardiovascular disease control, prevention and  
98 management of drug abuse, misuse and addiction<sup>[10]</sup>.

99 The community pharmacy practice in China has developed rapidly since the 21<sup>st</sup> century with the  
100 progress of national healthcare reformation. Pharmaceutical services including chronic disease  
101 management, patient education and consulting, scientific knowledge popularization in  
102 communities are provided in most of the community pharmacies in China in addition to drug  
103 dispensing. Although gap still exists between the PC services being provided in China and some  
104 developed countries, the experience Chinese community pharmacists gained during the  
105 COVID-19 outbreak is of great value for community pharmacies around the world for the  
106 following three reasons.

107 First, the current model of PC practice in China is similar to the model in foreign countries, from  
108 the services being provided to the content and actual procedure of each service. So the Chinese  
109 experience shall also be applicable to other countries. Secondly, the need of pharmaceutical care  
110 is different from what's been provided in traditional pharmacy practice, as discussed in section  
111 1.2, and learning the experience Chinese community pharmacists gained through real practice is  
112 crucial for those who will be facing this pandemic. Last but not the least, during this pandemic,  
113 pharmacists in China used a variety of approaches, such as mobile APPs and collaborating with  
114 neighborhood committees and drug companies, to provide consulting services online and ensure  
115 patients' drug supply at home. These approaches can also be applied in other countries as new  
116 strategies to provide PC and can potentially create new forms of pharmacy service in the future.

## 117 **2. Recommendations and guidance on providing PC**

118 In this section, we aim to provide reference for pharmacy management teams from an  
119 administrative perspective and for community pharmacists from a clinical perspective based on  
120 the previous analysis.

### 121 **2.1 Pharmacy management**

122 The community pharmacy management team shall actively adjust their operation process  
123 according to the characteristics of COVID-19 pandemic and related patients' need during home  
124 quarantine. In this section, we aim to provide guidance on how to get prepared for providing PC  
125 services from a pharmacy administration perspective.

#### 126 **2.1.1 Ensure adequate supply of medications and products for COVID-19 prevention**

127 During the pandemic, the public mostly rely on community pharmacies to get adequate supply of  
128 their daily medications and COVID-19 preventative products (e.g. masks, alcohol-based hand

129 rubs). Community pharmacies shall keep “appropriate stocks of pharmaceutical products to  
130 supply the demand”, as suggested in FIP’s “Information and interim guidelines for pharmacists  
131 and the pharmacy workforce” for COVID-19 outbreak <sup>[2]</sup>. Medications and COVID-19  
132 preventative products are essential for community patients’ chronic disease management and  
133 control of the pandemic. Thus, pharmacy management teams shall make ensuring their supply a  
134 priority when getting prepared for and during the pandemic.

135 Based on the Chinese experience, community pharmacies can support the drug supply of chronic  
136 disease patients through real-time information sharing on drug purchase and drug delivery  
137 services. Pharmacies can share the information of drug availabilities and its store locations online  
138 or through mobile APPs to guide patients when they need to buy medications. For patients not  
139 able to visit the pharmacy, mail order or home delivery service can be offered by working with  
140 social works, volunteers, care coordinators, or drug companies. Through close collaboration with  
141 such personnels and organizations, Chinese community pharmacies have made great  
142 achievement in ensuring adequate drug supply for community patients. For example, in  
143 quarantined communities where residents are not allowed to go outside, pharmacies worked with  
144 neighborhood committee staff to provide drug delivery services. For patients with special  
145 diseases, such as cancer, hepatitis and irritable bowel disease, pharmacies worked with drug  
146 companies to ensure their drug supply during the pandemic.

### 147 **2.1.2 Ensure safe and efficient operation**

148 Community pharmacies shall take measures to ensure safe and efficient operation during the  
149 pandemic, such as appropriate environment control, staff protection and emergency plan  
150 establishment. Pharmacies can refer to the “CORONAVIRUS SARS-CoV-2 INFECTION:  
151 Expert Consensus on Guidance and Prevention Strategies for Hospital Pharmacists and the  
152 Pharmacy Workforce (2<sup>nd</sup> Edition)” published by Chinese Pharmaceutical Association for  
153 environment control strategies and staff protection wearing recommendations based on the risk  
154 level <sup>[1]</sup>. Pharmacies shall follow national or local regulations to clean and disinfect pharmacy  
155 environment properly. All pharmacy staff shall be provided with effective and sufficient personal  
156 protection equipment (PPEs) for self-protection. Additionally, pharmacy shall establish new  
157 workflows in face of the COVID-19 pandemic and create emergency plans or protocols on the  
158 management of COVID-19 and potential drug shortages.

### 159 **2.1.3 Staff Training**

160 Community pharmacies shall perform whole staff training to provide pharmacy staff adequate  
161 knowledge on COVID-19 prevention and control and pharmacy environment control. Guidance  
162 on the new workflow and emergency plans in face of the pandemic shall also be included.

163 Additional clinical training shall be provided for pharmacists on the diagnosis and treatment of  
164 COVID-19. Pharmacists shall particularly master the content related to community patient  
165 populations, such as patient screening and referral criteria, methods for effective self-protection  
166 <sup>[15]</sup>, counseling points of related medications, chronic disease management of the elderly <sup>[16]</sup>,  
167 home care <sup>[8]</sup>, psychological support <sup>[17]</sup>, and so on. Adequate training of pharmacists is essential  
168 for the successful delivery of PC services.

## 169 **2.2 Pharmaceutical care services**

### 170 **2.2.1 Guiding principles of providing PC**

171 During the outbreak, patient-centered PC shall be provided by community pharmacists, with the  
172 ultimate goal of promoting COVID-19 prevention and control and ensuring safe medication use  
173 in the community patient population. When providing services, pharmacies shall work their best  
174 to reduce the need of patient visits to the pharmacy or other medical institutions to control the  
175 risk of infection. Additionally, each pharmacy may offer targeting PC services based on the  
176 patient population characteristics of its surrounding communities.

### 177 **2.2.2 Approaches to provide PC**

178 During the COVID-19 pandemic, community pharmacies shall actively provide patient  
179 consulting services through a variety of approaches in addition to regular drug dispensing and  
180 patient education at the counter to reduce patients' unnecessary visits to the pharmacy. Remote  
181 access to pharmacists can be provided through phones, mobile APPs and the internet. In China,  
182 physicians and pharmacists have been using mobile APPs to provide online consulting services.  
183 This approach saves patients' trip to medical institutions and is safer to both healthcare providers  
184 and patients comparing to traditional on-site visits.

185 The method to access pharmacists remotely can be publicized through posters or flyers in the  
186 pharmacy and the surrounding communities, notifications on the internet, text messages or  
187 emails. These routes can also be used to popularize strategies for scientific prevention and  
188 control of the COVID-19. In addition, mail order or drug delivery services shall be provided if  
189 possible to ensure patient's home supply of medications and reduce patients' needs for outdoor  
190 pharmacy visits (as discussed in 2.1.1).

### 191 **2.2.3 The model of community pharmacy services during the COVID-19 pandemic**

192 See Figure 1 for the recommended model of community pharmacy service during the COVID-19  
193 pandemic. As shown, the left side of community pharmacy listed three approaches through  
194 which pharmacy service can be provided. On the right side, six domains of PC services are listed  
195 with key words. In this section, we will discuss the content that needs to be included in these six  
196 domains in detail.

**197 (1) Drug dispensing, patient screening and referrals**

198 When performing drug dispensing and patient interaction during the COVID-19 pandemic,  
199 pharmacists shall pay extra attention to patient's self-protection and emotional situation  
200 (discussed in (6)). For example, pharmacists can check if the patient is wearing mask or  
201 performing respiratory hygiene properly. Pharmacists shall be readily available to provide  
202 consultation on proper self-protection skills or psychological support for these identified patients  
203 as discussed in (4) and (6). If the pharmacy is short on a prescription medication, a therapeutic  
204 equivalent substitution shall be considered for dispensing under patient's agreement to avoid  
205 additional traveling to other pharmacies.

206 Community pharmacy shall also establish a collaborate relationship with its surrounding fever  
207 clinics and designated COVID-19 medical institutions for mutual patient information sharing  
208 during transitions of care. It can happen both ways. At the pharmacy, patients shall be screened  
209 with body temperature measurement. Pharmacists shall make extra efforts to identify suspected  
210 patients based on clinical symptoms such as coughing and fatigue, and epidemiological history  
211 such as travel history to Wuhan city or its surrounding areas in the past fourteen days. If such  
212 patient is identified, immediate isolation in a single room shall be performed if possible and  
213 pharmacist shall encourage and support the patient in seeking immediate medical treatment in  
214 designated institutions. On the other side, a 14-day isolated observation at home is recommended  
215 for COVID-19 patients discharged from medical institutions as they still have compromised  
216 immunity <sup>[3]</sup>. Pharmacists can offer medication reconciliation, consultation and home care  
217 guidance (as discussed in (5)) for these patients to support their recovery at home.

218 Refer to CDC website for criteria on patient evaluation and the FIP interim guideline for more  
219 guidance on isolation and referral practice when suspected patients are identified at the pharmacy  
220 <sup>[2, 5]</sup>.

**221 (2) Chronic disease management <sup>[16]</sup>**

222 During the COVID-19 pandemic, pharmacists shall actively provide guidance to community  
223 patient population on chronic disease management to improve patients' medication adherence  
224 and support their self-monitoring of the effectiveness and safety of current therapy. Pharmacists  
225 shall instruct patients to take home medications on time with the same dosage as usual, and  
226 emphasize the importance of adherence in chronic disease control and in avoiding unnecessary  
227 hospital visits during the pandemic. Patients shall make sure the medication is within the period  
228 of validity before taking. Do not take expired medications due to drug shortage or to avoid  
229 pharmacy visits. Inform patients on the availability of drug delivery or mail order services  
230 provided in the pharmacy and encourage patients to use such services during the pandemic if

231 needed.

232 In addition, chronic disease patients shall be educated to perform self-monitoring on disease  
233 control and adverse drug reactions at home. For example, patients with stable hypertension shall  
234 measure blood pressure 1-2 times a week at home. If the result is above systolic pressure of 180  
235 mmHg and/or diastolic pressure of 110 mmHg, patient shall seek immediate medical assessment.  
236 Pharmacists shall also make sure patients are aware of the common adverse reactions of their  
237 current medications and reinforce what side effects they shall monitor for during a long-term of  
238 home stay. Help patients to understand the concept of adverse drug reactions appropriately, and  
239 know how to distinguish minor side effects and severe drug reactions that needs medical  
240 intervention.

241 For community patients with cancer, irritable bowel disease or other special chronic diseases or  
242 patients taking high risk medications chronically, additional guidance shall be provided based on  
243 the characteristics of the diseases or medications. For example, warfarin patients are at a high  
244 risk of drug adverse reactions as they may not able to check INRs regularly and their diets are  
245 susceptible to change during the pandemic. Pharmacists shall educate patients to monitor signs  
246 and symptoms of bleeding and clotting. Patients with stable INR results can reasonably extend  
247 the monitoring cycle. Community pharmacists in China have also been using mobile APPs to  
248 organize such patient groups to provide consulting services and pharmacy drug supply  
249 information online.

### 250 **(3) Safe use of infusions**

251 Due to the increased risk of cross infection among patients and healthcare providers, unnecessary  
252 infusions shall be avoided during the COVID-19 pandemic. For medical institutions providing  
253 infusion service, community pharmacists shall assist the care team in establishing a specific  
254 safety operation process during patients' visits, in addition to providing regular pharmacy  
255 services on medication safety. The safety operation process shall include a set of strategies, such  
256 as environment cleaning and disinfection, patient screening at the gate, limiting patient numbers,  
257 and separating patients with safe distance when lining up and infusing drugs, to prevent cross  
258 infection in the medical institution and during the drug infusion.

### 259 **(4) Patient education**

260 Based on the need of community patients during the COVID-19 outbreak, patient education or  
261 consulting services shall be provided by community pharmacists on disease prevention,  
262 COVID-19 early identification, and proper medication use. Scientific prevention and control  
263 knowledge of the COVID-19 shall be provided to community patients through a variety of  
264 approaches as discussed in 2.2.2. The content of such education shall include but not limit to the

265 selection and proper use of masks, hand hygiene, respiratory hygiene, selection and safe use of  
266 disinfection products, self-protection strategies outdoors and at the office <sup>[2, 6-7, 15]</sup>.

267 Additionally, basic knowledge on COVID-19 and SARS-CoV-2, particularly the onset symptoms  
268 and transmission routes, shall be provided to help community population understand the  
269 pandemic situation properly and promote early identification of suspected individuals. Educate  
270 patients on how to distinguish common cold, flu and COVID-19, and make sure they know when  
271 to seek medical help. For patients only have upper respiratory symptoms such as sneezing, runny  
272 nose and sore throat, and are relatively young with no baseline chronic disease, home care with  
273 isolation and observation shall be performed with symptomatic treatment (if needed) first to  
274 avoid unnecessary visits to medical institutions. Seek medical assistance if disease continue to  
275 progress or if the patient developed COVID-19-related symptoms <sup>[15]</sup>.

276 Pharmacists shall make it clear to patients that there is no effective vaccine or targeting  
277 therapeutic agent for COVID-19 prevention or treatment at present. In case of suspected  
278 symptoms such as fever, cough and fatigue, patients shall seek timely medical support and  
279 follow physicians' treatment plan. Avoid blind use of medications or so-called "wonder drugs".  
280 When dispensing new medications, assess patients' current medication list to identify duplicate  
281 therapy and provide medication education to ensure safe use of dispensed medications.

#### 282 **(5) Home care** <sup>[8]</sup>

283 Pharmacists can refer to the "Home care for patients with suspected novel coronavirus infection  
284 presenting with mild symptoms and management of contacts (Interim guidance)" published by  
285 WHO to provide guidance for families with patients isolated at home for medical observation,  
286 and families with mild stage patients on treatment at home. Make sure that the home  
287 environment is well-prepared, properly cleaned and disinfected according to the above guideline,  
288 including the suspected patients' tableware and articles for daily use (see Appendix 1 for a  
289 sample checklist of environmental conditions <sup>[18]</sup>). Ensure that all isolated patients and related  
290 family members are aware of the significance of scientific prevention, and are able to master  
291 such skills.

#### 292 **(6) Psychological support** <sup>[17]</sup>

293 The outbreak of COVID-19 and the sudden change of routine daily life, together with the fear or  
294 concern of being infected by the SARS-CoV-2 from anyone at anytime may lead to emotional  
295 problems in some community patients. During the interaction and communication with patients,  
296 pharmacy staff shall pay attention to their emotional or psychological conditions, and identify  
297 patients with excessive anxiety, concern, fear or blind optimism. For such patients, psychological  
298 or emotional support shall be provided. If the patient is considered having a psychological

299 problem that needs assessment or treatment, referral to psychiatrist shall be made. Additionally,  
300 to promote patient's mental health during the pandemic, pharmacists shall aid the community  
301 patient population to understand the COVID-19 pandemic situation properly, and adjust their  
302 psychological state and recognition to view things from positive perspectives. Encourage the  
303 public to maintain regular work and rest schedule with adequate exercise to enhance the  
304 immunity system and relieve negative emotions at the same time.

### 305 **3. Conclusion**

306 Community pharmaceutical care services during the COVID-19 outbreak shall possess different  
307 properties due to disease characteristics and related change in patients' need. Community  
308 pharmacies shall work as a strong supporter of patient's medication and protective equipment  
309 supply. Community pharmacists shall be prepared to provide skilled and effective PC services  
310 for community patient population to ensure medication safety and promote the overall  
311 COVID-19 pandemic control.

312

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317 staff from other professions who are fighting or have served to fight this COVID-19 pandemic in  
318 the front line. In this smokeless war, heroes who sacrificed their lives to save others will be  
319 engraved in people's mind.

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322 **Conflict of interest**

323 To the best of our knowledge, the named authors have no conflict of interest, financial or

324 otherwise, of the submitted work.

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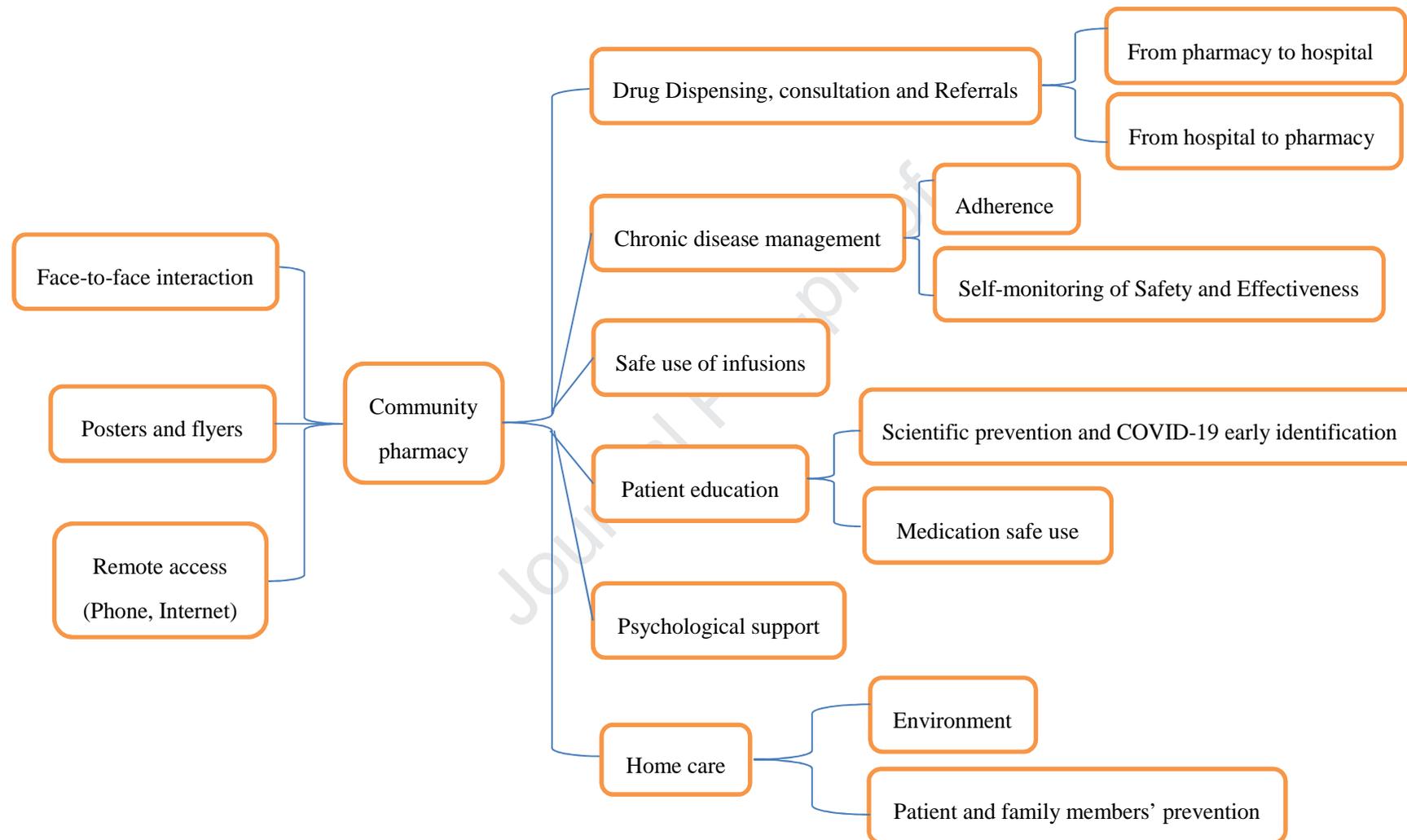


Figure 1: An overview of the recommended content of community pharmaceutical care services during the COVID-19 outbreak

**Appendix 1. WHO Sample checklist assessment of environmental conditions for home care of patients with acute respiratory infections (ARIs) of potential concern <sup>[18]</sup>**

The sample checklists below can be used to assess environmental conditions for home care of patients with ARIs of potential concern. Circle “Y” (yes) or “N” (no) for each option.

**Infrastructure**

Functioning telephone	Y	N
Any other means to rapidly communicate with the health system	Y	N
Potable water	Y	N
Sewerage system	Y	N
Cooking source (and fuel)	Y	N
Operable electricity	Y	N
Operable heat source when required	Y	N
Adequate environmental ventilation	Y	N

**Accommodation**

Separate room or bedroom for the patient	Y	N
Accessible bathroom	Y	N

**Resources**

Food	Y	N
Necessary medications	Y	N
Medical masks (patient)	Y	N
Medical masks (care providers, household contacts)	Y	N
Gloves	Y	N
Hand-hygiene items (soap, alcohol-based hand rub)	Y	N
Household cleaning products	Y	N

**Primary care and support**

Person to provide care and support	Y	N
Access to medical advice and care	Y	N
Any at-risk people at home (e.g. children < 2 years of age, elderly > 65 years of age, immunocompromised people)	Y	N