

Coronavirus Pandemic

Current separating / screening process for suspected patients with COVID-19 at Hue University Hospital, Vietnam

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Introduction

The COVID-19 pandemic has rapidly spread around the world, causing the exponential increase of COVID-19 cases and overwhelming the health systems globally [1-2]. As healthcare workers, we are facing an unprecedented problem: How to prevent in-hospital transmission of COVID-19 infection, which derived from unknown infected or suspected cases of COVID-19 that hospitalized for other diseases? Our solution is to build a process in which separating and screening all the patients immediately after their admission. Based on the principle "mistakes rather than omissions", the process is acceptable in this urgent situation. Since the hospitalized patients need medical care, early differential diagnosis of COVID-19 plays a very important role in providing prompt management for patients and reducing the possibility of cross-infection, which may worsen the condition of their underlying diseases. We wish to share the process that has been applied in our hospital as a strategy to prevent the spread of COVID-19 within the health facilities.

Separating/screening process for COVID-19 suspected patients

Many measures have been implemented in Vietnamese hospitals to limit and control COVID-19 [3]. In particular, the separating/screening process is the initial base to detect infected patients while avoiding the overload of suspected COVID-19 cases. At the entrance of the outpatient and emergency department, the separating/screening process is conducted by medical staff, initially with taking the body temperatures, followed by quick examinations and short-answered

questions to finally reach the classification result (Table 1).

The patients will also be classified as "screening" if they do not cooperate in the process even without fever or respiratory symptoms. In the emergency room, patients with any clinical conditions are all required to be questioned and/or examined quickly before emergency treatment to eliminate the risk of omission. If the patients have COVID-19-related factors (clinical or epidemiological), they will be considered as a COVID-19 suspected case. Therefore, the emergency treatment will be provided in an isolation room. On the figure 1 there is the separating/screening process that has been implemented in Hue University Hospital since 26/02/2020 (Figure 1).

The epidemiological factors of COVID-19 [3-5] are listened below:

A person is considered as having epidemiological risk factors if within the previous 14 days, he/she:

1. Has been exposed to a COVID-19 infected person;
2. Has had family member who was exposed to a COVID-19 infected person;
3. Has returned from countries with ongoing spread of COVID-19;
4. Has had family members who returned from countries with ongoing spread of COVID-19;
5. Has close contacted with someone who returned from countries with ongoing spread of COVID-19;
6. Has returned from an area that one COVID-19 case had been confirmed;

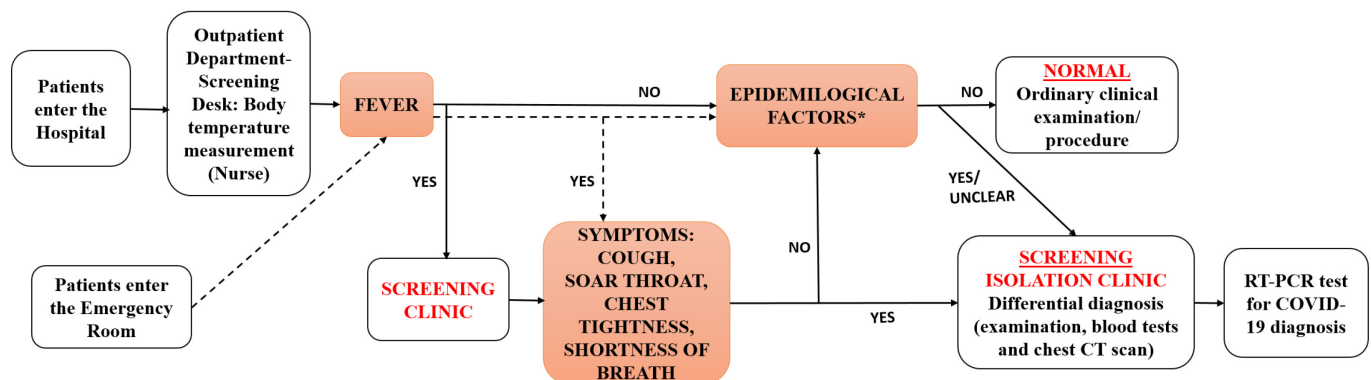
Table 1. Classification of patients in the COVID-19 separating/screening process.

	Fever	Respiratory symptoms	Epidemiological factors	Classification
1	No	No	No	Normal
2	Yes	No	No	Normal
3	Yes	Yes	No	Screening
4	Yes	No	Yes/Unclear	Screening
5	Yes	Yes	Yes/Unclear	Screening
6	No	No	Yes/Unclear	Screening

Table 2. Factors and signs for early differential diagnosis of COVID-19.

Factors and signs	Diseases should be differentiated			
	Covid-19	Seasonal flu	Dengue fever	Pharyngitis
Epidemiological factors				
Cold seasons: winter, spring.	Yes	Yes	Any	Any
Through contact: droplets, surface.	Yes	Yes	No	No
Main groups of patients	The elderly, adults, with underlying health conditions	Children, pregnant women, the elderly	Children, adults	Children, teenagers
Travel/contact history				
Traveled, used public transport services, went to crowded places...	Yes	Yes or no	Yes or no	Yes or no
Returned from covid-19 epidemic regions	Yes	No	No	No
Close contacted with someone who had contacted with a confirmed covid-19 case	Yes	No	No	No
Close contacted with a confirmed covid-19 case	Yes	No	No	No
Clinical signs				
High heart rate	Yes	Yes	Yes	Yes or no
Constant high fever	Yes	Yes	Yes or no	Yes or no
Tiredness	Yes	Yes	Yes or no	No
Aches and pains	Yes	Yes	Yes or no	No
Sore throat, dry cough, sneeze, runny nose, expectoration (respiratory symptoms)	Yes	Yes	No	Yes or no
Shortness of breath	Yes	Yes	No	No
Laboratory results				
White blood cell count increased, crp increased, blood sedimentation rate increased	Yes	Yes	Yes	Yes
Platelet count decreased	No	No	Yes	No
Prolonged bleeding time, prolonged coagulation time	No	No	Yes	No
Imaging diagnosis				
Chest ct (computed tomography) scans: images of interstitial pneumonia or atypical pneumonia	Yes	Yes or no	No	No

Figure 1. Separating/screening process for suspected patients with COVID-19 at Hue University Hospital.



8. Has used public transport services or attended a crowded place with high risk of virus transmission without wearing masks or disinfecting hands;

9. Has directly contacted with wild animals or live products of wild animals.

This separating/screening process showed effectiveness in preventing SARS-CoV-2 infected patients entering the hospital without appropriate preparation.

Which diseases need to be early differentiated and how?

Several diseases, particularly seasonal flu, Dengue fever, and pharyngitis, have clinical and epidemiological features that are quite similar to those of COVID-19 [6-8]. If only rely on these factors to classify patients, it might lead to the overload of screening and isolating cases, not to mention the risk of delayed treatment, cross-infection, hospital infections, etc, causing undesirable consequences for both the patients and the hospital. Therefore, early differential diagnosis of COVID-19 is very important (Table 2).

At the Outpatient Department of Hue University Hospital, more than 800 patients admitted each day, of which about 20 people are classified as “*screening*”. After differential diagnosis, only a few cases are sufficient with clinical, epidemiological, and laboratory factors to be isolated and monitored, as well as undergo the RT-PCR test for the diagnosis of COVID-19. Clinical symptoms such as cough, sore throat, chest tightness, shortness of breath, in association with epidemiological history, are initial signs of a COVID-19 suspected patient [9,10]. In the case of clinical signs but unclear epidemiological factors, chest CT scan showed its usefulness in the diagnosis of COVID-19. According to a study by Wei-Cai Dai et al in China [11], 90% to 95% of the imaging diagnostic methods for COVID-19 suspected patients were chest CT scans with a high rate of viral pneumonia detection, indicates the significant role of chest CT scans in the early diagnosis of SARS-CoV-2 infection. Other research by Yan Li and Liming Xia [12] determined that chest CT scan had a low omission rate of COVID-19 diagnosis (3.9%, 2/51 patients) and could be used as a standard method for rapid diagnosis of COVID-19 in order to optimize patient screening and management. In combination with clinical symptoms and epidemiological history, they are of great significance in the early diagnosis of COVID-19. The current process could be implemented in health facilities with similar conditions to our hospital. Further improvements are still ongoing in an

effort to build a better separating/screening process during the COVID-19 crisis.

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