Design Strategies for Infectious Disease Departments in General Hospitals in the Dual Consideration of Normal-pandemic Situation: Basing on the Case of Shenzhen in China

1 Background and Purpose

Since 2019, COVID-19 has been raging around the world and has had a significant impact on the healthcare system, seriously affecting and updating the infectious disease departments in general hospitals. In China, major epidemic prevention and treatment research [1]. The infectious disease department in general hospitals occupies an important position and assumes the task of controlling sporadic pandemics and treating patients. However, once the SARS-CoV-2 pandemic and the implementation of the construction of infectious disease department in general hospitals in Shenzhen, infectious disease departments have been operating under the conditions of normal-pandemic situation for a long time. Therefore, the development of infectious disease departments has not been sufficiently effective. This is why, in the new era, infectious disease departments in general hospitals need to do their best in normal-pandemic situation, and to do their best in the dual consideration of normal-pandemic situation. The purpose of this paper is to systematically analyze the current situation and status of infectious disease departments in general hospitals, and then to put forward design strategies for infectious disease departments in general hospitals, for the infection of the COVID-19 disease combined with the design to provide functional basis and design inspiration.

2 The difference between normal and pandemic situations

2.1 Differences in infectious diseases with coping strategies

2.1.1 General operating, infectious diseases can be divided into two categories: non-pandemic situations and pandemic situations. In non-pandemic situations, infectious diseases are sporadic and may occur in one or more worldwide pandemics. The current pandemic situation is currently the most frequent category of infectious disease. But in the future, infectious diseases may still occur in non-pandemic situations, and more infectious diseases may occur in pandemic situations. Thus, the design of infectious disease departments in general hospitals needs to be made in the dual consideration of normal-pandemic situations. At the same time, in the future, infectious diseases may still occur in non-pandemic situations and in pandemic situations.

2.2 Differences in prevention and treatment strategies

Infectious disease departments need to consider two main aspects in the treatment of infectious diseases:

1) To ensure safety in treatment and control of patients with the immediate need of emergency care, healthcare workers in the traditional infectious disease department, the staff for medical personnel, medical supplies, and space quantity of the infectious department will greatly increase.

2) To ensure the ability to prevent and control infectious diseases, the infrastructure for the management of patients, medical care and medical treatment. In the case of non-pandemic situations, infectious disease departments can be laid in the medical area of the building, and in the case of pandemic situations, infectious disease departments can be laid in the medical area of the building, and in the case of pandemic situations, infectious disease departments can be laid in the medical area of the building.

3) To ensure the ability to control infectious diseases, healthcare workers in the traditional infectious disease department, the staff for medical personnel, medical supplies, and space quantity of the infectious department will greatly increase.

2.3 Differences in the design concept of infectious disease departments

2.3.1 Flow organization

1) Patient streamline: Patients in non-pandemic situations were brought through the outpatient hall, while patients in pandemic situations were brought through the emergency hall.

2) Medical equipment: in non-pandemic situations, the process of wearing and removing protective equipment for medical care is rarely required. However, in pandemic situations, the process of wearing and removing protective equipment for medical care is frequently required.

3) Ventilation and air conditioning: In non-pandemic situations, the exhaust and emission of infectious diseases can be controlled by the ventilation and air conditioning system. However, in pandemic situations, the ventilation and air conditioning system needs to be strengthened to control the spread of infectious diseases.

4) Infection control: In non-pandemic situations, the control of infectious diseases mainly relies on the physical control, such as personal hygiene, environmental hygiene, and so on. However, in pandemic situations, the control of infectious diseases mainly relies on the physical control, such as personal hygiene, environmental hygiene, and so on.

5) Data flow: In non-pandemic situations, the data flow is relatively stable, while in pandemic situations, the data flow is significantly increased.

6) Medical layout: in non-pandemic situations, the medical layout is relatively stable, while in pandemic situations, the medical layout needs to be changed to meet the needs of the treatment.

3 Influencing factors

3.1 Functional positioning

Functional positioning is the most critical factor affecting the combination of infectious disease departments and departments, which determines the design concept and standards of infectious disease departments in general hospitals in the dual consideration of normal-pandemic situations. When performing the planning of infectious disease departments, the design team should consider the functional positioning of the infectious disease department and the departments it is connected to, so as to ensure the function of infectious disease departments and departments it is connected to.

3.2 Economic budget

Economic budget determines the level and extent of the construction of the infectious disease department and departments, and influences the design concept and standards of infectious disease departments in general hospitals. Therefore, the design team should consider the economic budget when performing the planning of infectious disease departments.

3.3 Epidemic prevention and protection standards

The design standard of epidemic prevention plays an important role in protecting the safety of the combination of infectious disease departments and departments. However, when performing the planning of infectious disease departments, the design team should consider the epidemic prevention standards of infectious disease departments and departments, so as to ensure the function of infectious disease departments and departments it is connected to.

3.4 District planning

The planning of the department determines the surrounding environment and the conditions of infectious disease departments and departments, and influences the combination of epidemic prevention and treatment, influencing the factors of the surrounding environment and the conditions of infectious disease departments and departments. Therefore, when performing the planning of infectious disease departments, the design team should consider the function of the surrounding environment and the conditions of infectious disease departments and departments.

4 Design Strategies

According to the different classification of coping strategies, the design strategies for the dual consideration of normal-pandemic situations can be divided into three types:

4.1 Normal-pandemic situation of spatial transformation type

4.1.1 Sustainability of functional housing

4.1.2 Feasibility of functional layout

4.1.3 Feasibility of the space environment

4.2 Normal-pandemic situation of emergency expansion type

4.2.1 Coordination of flow organization

4.2.2 Reversibility of functional configuration

4.2.3 The economy of the space environment

4.3 Normal-pandemic situation of economical adoption type

4.3.1 Rigidity of flow organization and functional layout

4.3.2 Simplicity of spatial transformation

4.3.3 The economy of the space environment

References


Fig 1. China's network of provider, search risk and treatment of SARS-CoV-2

Fig 2. The planning of infectious disease departments in different scenes of normal and pandemic situations in China.

Fig 3. The functional positioning of infectious disease departments in different scenes of normal and pandemic situations in China.

Fig 4. The functional positioning of infectious disease departments in different scenes of normal and pandemic situations in China.

Fig 5. The functional positioning of infectious disease departments in different scenes of normal and pandemic situations in China.

Fig 6. The functional positioning of infectious disease departments in different scenes of normal and pandemic situations in China.

Fig 7. The functional positioning of infectious disease departments in different scenes of normal and pandemic situations in China.

Fig 8. The functional positioning of infectious disease departments in different scenes of normal and pandemic situations in China.

Fig 9. The functional positioning of infectious disease departments in different scenes of normal and pandemic situations in China.