



Biosecurity countermeasures of transporting high-risk persons during the epidemic prevention and control of COVID-19 in Jiangsu Province

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Abstract: COVID-19 is spread mainly through respiratory droplets. With the development of COVID-19 worldwide, international airports are facing unprecedented imported risks, becoming the forefront of overseas epidemic prevention. The transmission mechanism of the disease is easy to implement due to the general human susceptibility. Despite the ongoing development of COVID-19 vaccines, the public health community still needs to establish nonpharmaceutical interventions to mitigate the spread of COVID-19 in the population, especially among individuals in close contact with confirmed cases. Since the outbreak of COVID-19, relevant authorities in China have taken active prevention and control measures, strictly tracked down and isolated those involved, and effectively contained the spread of the epidemic. Medical workers have played an important role in epidemic prevention and control. Medical workers are putting their lives and health at risk because of a lack of knowledge about COVID-19. This review summarizes the work of preventing cross-infection in the transport of high-risk groups by ambulance in primary hospitals in Jiangsu province during the COVID-19 outbreak. Through standardized management, the cross infection caused by ambulance has been effectively prevented. Therefore, during the COVID-19 outbreak, establishing a safe disinfection management system, strengthening the disinfection management of ambulance transport, and training personnel in personal protection, work requirements and emergency response skills can effectively prevent the spread of the COVID-19.

Keywords: COVID-19; high-risk individuals; transshipment

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Introduction

At present, the COVID-19 has rapidly spread worldwide, causing millions of deaths (1-3). It is urgent to share and exchange effective and feasible practices in epidemic prevention and control (4,5). In accordance with the

COVID-19 prevention and control requirements, authorities in Jiangsu have taken strictly measures to prevent the further spread of the virus. This review focus on the prevention of cross-infection in the transport of high-risk COVID-19 individuals in Jiangsu. We expect to effectively avoid occupational exposure and cross-infection

through standardized transport procedures.

Identification of high-risk individuals

High-risk individuals mainly refer to close contacts of confirmed COVID-19 cases, close contacts of close contacts of COVID-19 cases, and inbound persons who are planned to be transferred to centralized quarantine observation sites.

SKM (personal health information code of Jiangsu) were used to identify high-risk groups in Jiangsu. Based on the health data of the declared objects, the SKM were dynamically generated after comparison with relevant data, including whether users had been to virus-hit areas and had contact with confirmed cases.

Prevention and control measures

Basic requirements

- (I) Through the establishment of COVID-19 emergency management system, the main responsibility for epidemic prevention and control will be strictly implemented.
- (II) The transport of high-risk persons should be carried out in accordance with the pathogenic characteristics of the COVID-19, including the sources of infection, transmission routes, susceptible groups and diagnosis and treatment conditions.
- (III) In case of confirmed or asymptomatic COVID-19 cases were detected, transport departments should cooperate with health departments in handling the epidemic situation.

Transshipment measures

Measures before transshipment

- (I) Carry out training on personal protection, work requirements, emergency response and other skills for personnel involved in transport. All frontline healthcare workers (HCW) involved in the transport should be vaccinated against COVID-19, establish a staff health monitoring system, and register their health status every day.
- (II) Formulate a list of epidemic prevention materials required for transport, arrange special personnel to prepare in advance, and check carefully. Transport vehicles should be equipped with relevant medical materials based on the number of persons to be

transferred, including disposable work caps, medical protective masks, medical surgical masks, protective face screens or goggles, protective clothing, waterproof boot covers, inspection gloves, surgical gloves, forehead thermometer, sanitizer, medical garbage bags, covered trash cans, disposable water absorbent materials, disinfectants, and sterile dry towels.

- (III) Ensure the provision of an adequate supply of high-quality personal protective equipment (PPE) proper donning and doffing arrangements, training regarding its use. Proper practice of PPE by HCWs in the transfer vehicle are necessary to get protection from COVID-19 infection. The best way for HCWs to prevent infection is through practice and demonstrated competency in donning proper use of PPE, such as regularly using disposable work caps, protective clothing, medical protective masks, protective face screens, work shoes.
- (IV) Select appropriate transfer vehicles and divide different functional areas inside the vehicle: the front structure of the vehicle is sealed and separated by transparent plates (with doors) as the riding area for HCWs and the placing area for epidemic prevention materials; The rear of the vehicle is a temporary isolation area for transport of high-risk individuals.
- (V) Strictly control the number of suspected cases transferred in the vehicle, which should not exceed 1/3 of the approved capacity of the transfer vehicle. Guide the high-risk individuals to take seats in scattered to reduce the risk of cross infection. For minors or disabled persons, it is recommended to set up special areas and arrange escort personnel as appropriate.

Measures for transshipment

- (I) Always perform hand hygiene between high-risk person contacts.
- (II) Optimize the vehicle's ventilation to increase the volume of air exchange during transport. Air-flow in vehicle should be switched on and maximum air volume maintained. Vehicles that have separate HCWs and high-risk compartments that can provide separate ventilation to each area.
- (III) Screen patients requiring ambulance transport for symptoms of COVID-19. Once high-risk individuals show symptoms of influenza, such as fever and cough, they will be immediately guided to the temporary isolation area inside the vehicle.
- (IV) In case of vomiting, disinfection and disposal should

be carried out according to standard precautions.

- (V) Any member undertaking transshipment that requires close (within one metre) contact or any aerosol generating procedure with high-risk individuals should use a proper PPE.
- (VI) Direct transshipment should be adopted to ensure that high-risk groups are fully managed during the transshipment process.

Measures after transshipment

- (I) After arriving at the centralized isolation observation site, the vehicle is parked in the designated area, and HCWs should keep accurate records of any transports of high-risk individuals.
- (II) After transport, the ambulance should be left for a period of 10 minutes before disinfection to allow droplets to fully settle on surfaces, with the windows and doors left open. Vehicle that has been disinfected should be ventilated for more than 30 minutes.
- (III) Drivers and medical personnel remove and disinfect protective clothing in designated areas in accordance with standard procedures.

Disinfection of transfer vehicles

- (I) Use 500 mg/L effective chlorine disinfectant, or other disinfectants that obtained the safety evaluation record, disinfect the environmental surfaces that are frequently touched by the patient or are soiled with body fluids according to the requirements of the manual. After disinfection with corrosive disinfectant, residual disinfectant should be cleaned with water.
- (II) Clean air conditioning filter screen regularly and disinfect air conditioning surface. Soak the screen for 30 min with 500 mg/L effective chlorine disinfectant in accordance with the specification.
- (III) In case of vomiting or sputum during transportation, contaminants should immediately be wiped by disposable absorbent materials and sufficient amount of disinfectant or sterile dry towels. Cleaning personnel should wear gloves, gown, eye protection (if body fluid exposure is anticipated) and a surgical mask.

Discussion

COVID-19 is highly contagious, and there is a high risk of admission and transport of patients. Therefore, safe and effective inter-hospital transport is of great significance to successfully treat patients and reduce the probability of

infection among HCWs.

Since the outbreak of COVID-19, China has adopted active epidemic prevention and control measures in accordance with the infectious disease prevention and control, which have effectively contained the spread of the epidemic and basically eliminated local cases of COVID-19 (6).

Prevention and control departments have established and improved safety and disinfection management systems, launched health emergency plans in a timely manner, formulated relevant systems and work procedures, and carried out various work in an orderly manner. In the process of transporting high-risk groups, inadequate infection prevention and control measures may lead to cross-infection among high-risk individuals or HCWs.

The transport of high-risk groups of COVID-19 has not only trained the first aid team, but also accumulated relevant working experience in the transport of infectious diseases (7). It is particularly important for the establishment of the emergency medical transport system to deal with the epidemic and other emergencies, and also laid a foundation for better emergency transport work in the future.

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Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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