Hazard control for communicable disease transport at Ornge

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INTRODUCTION

Transporting patients with communicable diseases is common in critical care transport operations. At Ornge, Ontario’s critical care transport provider, 13.7% of patients required contact, droplet, or airborne precautions during transport in 2019–2020. Ensuring that staff are protected while transporting patients with communicable diseases must remain a prime directive for medical transport administrators and operators. Success in safety requires a robust system of hazard identification and adherence to generally accepted methods of hazard control. This commentary will discuss some of the administrative and engineering controls, as well as the personal protective equipment (PPE) strategies deployed at Ornge.

ADMINISTRATIVE CONTROLS

In collaboration with infectious disease and Infection Prevention and Control (IP&C) experts, Ornge has developed the Infection Prevention and Control Resource Manual, which staff are required to review. The manual outlines Ornge’s IP&C protocols, including a point-of-care risk assessment, hand hygiene, PPE, cleaning and disinfecting, health maintenance, and post-exposure protocols. Included in the manual is a table of “Infectious Diseases that Pose a Risk to Paramedics.” The table outlines disease signs and symptoms, modes of transmission, communicable period, recommended precautions, relative risk, and post-exposure follow-up for communicable diseases that a transport team may encounter.

Referring staff are required to provide specific details regarding suspected or confirmed communicable diseases in patients who require transport from one facility to another. Questions related to the level of precautions being observed at the referring facility are also documented in the electronic call record. The Transport Medicine Physician (TMP) reviews all requests for service, including the communicable disease screen and, in some cases, consults with the transport team before launch or during transit. The information gleaned from the screening process allows teams to pre-emptively prepare for a transport using the information contained in the IP&C document and through consultation with the TMP.

ENGINEERING CONTROLS

Engineering controls include a broad category of barriers and processes designed to minimize the risk of communicable disease transmission. In hospital settings, a primary environmental engineering control is ventilation. Numerous organizations make recommendations...
are capable of 24 ACH. The driver cockpit and medical cabin ventilation. Land ambulances transport of patients with communicable diseases. To staff and the PPE required for their crews during the impact of environmental engineering in vehicles allows organizations to appropriately assess risk exposure the concept of reusable PPE. Options that contemplate the uniqueness of the transport environment are recommended. Reusable half-face mask respirators with disposable filters can increase comfort for the staff member, especially for extended duration utilization. The introduction of this type of respiratory protection also reduces reliance on N95 type of respirators as the single method by which to provide respiratory protection.

The use of powered air-purifying respirators (PAPR) can be considered in certain circumstances. PAPRs provide enhanced respiratory protection compared with an N95, as well as potential improvements to staff comfort when working in PPE for extended periods or in warmer environments. However, there is no evidence to show that they reduce the risk of transmission of potentially
Figure 1. Personal protective equipment utilization flow chart.
airborne spread viral disease. Additionally, implementation requires consideration of numerous issues related to the transport environment and equipment specific to the organization. Special attention must be paid to the development of a thorough initial and continuing education program. Protocols specific to PAPR utilization when other PPE options may be appropriate are essential. Impacts on pilots and medical crew must also be considered when making organizational PPE choices. Limitations on the use of other safety equipment (i.e., helmets) need to be reviewed and carefully weighed before operational deployment. Ornge has not adopted the widespread use of PAPRs at the time of writing, although a robust training program with targeted information about self-contamination avoidance is currently in production.

Critical care medical transport via land or air comprises numerous phases that require differing levels of PPE for the various crew members. Having a clear understanding of what PPE is required in each phase is critical for crew safety and can minimize PPE burn by preventing overuse. Additionally, it can ensure that staff are comfortable that their level of PPE will keep them appropriately protected. Therefore, as an aid to staff, Ornge developed a PPE utilization flow chart for each of our asset types, outlining what PPE to don for each phase of transport (Figure 1). While these charts do not address every eventuality, they provide an overarching framework that frontline workers can refer to during times of increased cognitive load. The flow charts helped reduce staff anxiety around the transport of patients with communicable diseases knowing that the PPE they are in is appropriate for the asset and transport phase. A comprehensive and regular review of PPE recommendations on an ongoing basis, as well as additional scrutiny during epidemic and pandemic conditions, is essential in providing frontline staff confidence in their PPE.

CONCLUSION

The transport of patients with communicable diseases is ubiquitous in medical transport. Organizations must have a vigorous IP&C program that considers the unique constraints of critical care medical transport on land and in air. The program should include a real-time system for hazard identification, as well as defined procedures that are responsive once a hazard is identified. An understanding of the specific environmental engineering controls related to their organizational

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### Figure 1

Continued.
assets is also recommended. An ongoing review of PPE supply, training, and education documents is an additional cornerstone of a robust IP&C program. Collectively, these elements will ensure that staff are both adequately protected but also comfortable and confident that they are safe when undertaking the care and transport of the critically ill patient with a communicable disease.

REFERENCES


