

A simple suggestion for safer patient transfer during COVID pandemic!

Sir,

During this coronavirus disease (COVID)-19 pandemic, a large number of inter and intra-hospital patient transfers are happening worldwide. Since the COVID-19 virus has a high propensity for human-to-human transfer via airborne, droplet and contact routes, high chances of viral transmission during patient transfer can occur if proper equipment is not used. Infection control is an essential part in anaesthesia and intensive care practice.^[1] Assiduously conducting transportation to minimise the aerosol generation is the pressing priority considering the current crisis. While the use of transport ventilators and closed circuits are advocated during the transfer of COVID-19 patients, availability of an adequate number of transport ventilators is always a concern in resource-limited settings. Transport ventilators can be really useful in the long-distance transfer of patients, but during a crisis, many a times, breathing circuits are used for intra-hospital transport of patients. We report a simple modification in breathing circuits to reduce the chances of aerosol dispersion to the surrounding during patient transfer.

Bain's circuit (coaxial modification of the Mapleson D) can be used for intra-hospital patient transfer. The recommended fresh gas flow (FGF) is 1.5 to 2 times minute ventilation, and that of tidal volume and frequency is 10 mL/kg and 12–14/min, respectively.^[2] However, during the transportation of suspected or confirmed COVID-19 cases, there is a substantial risk of aerosol exposure to the operator through the adjustable pressure-limiting (APL) valve, making this arrangement purposeless during the current scenario. Taking this into account, we modified the Bain's circuit for the safety of the healthcare provider by connecting heat and moisture exchange filter (HMEF) (HMEF 1000 Straight, Vincent Medical, Hung Hom, Kowloon, Hong Kong)^[3] both at the patient end and just before the APL valve [Figure 1], maintaining the FGF rate around 1.5–2 times the minute ventilation to prevent rebreathing. Whenever possible, before shifting the patient, we paralyse them, do a tracheal suctioning and use constant ETCO₂ monitoring during the patient transport while using this circuit.

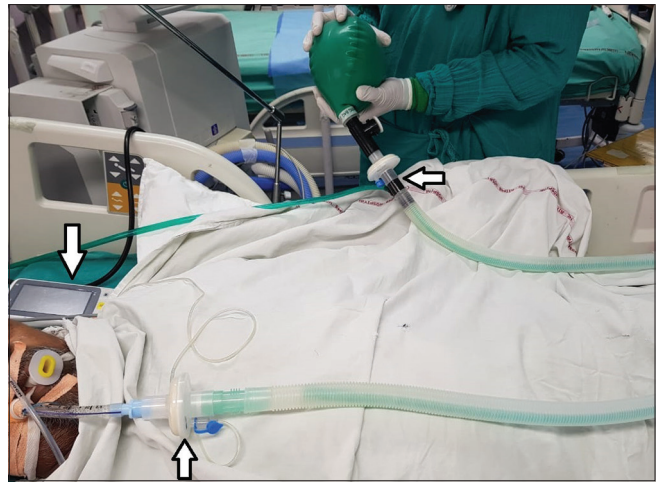


Figure 1: Figure showing Bain circuit with HMEFs. Arrows showing portable ETCO₂ monitor and 2 HMEFs attached at patient end and near APL valve

Nevertheless, this arrangement can have few limitations, i.e., chances of rebreathing, high airway resistance and constant requirements of high gas flows. Manual hyperventilation, guided by ETCO₂ takes care of the possibility of rebreathing. The possibility of higher airway resistance/barotrauma can be taken care by pre-shifting tracheal suctioning and temporarily regulating the tidal volume and respiratory rates if needed. It can be argued that higher FGF may generate more aerosols, but we believe that placing two HMEFs with an efficient viral and bacterial filtration efficiency (>99.99%) can take care of the majority of aerosols. In this context it is advisable to use HMEFs compliant with anyone of the two standards i.e., the International Standards Organisation (ISO) or the European standard norm (EN).^[4] The HMEF that we used is ISO compliant.^[3] However, since our modification cannot eliminate the chances of viral exposure completely, it is still advisable for the healthcare workers to use appropriate personal protective equipment during patient transfer. Before using the circuit, we need to double-check the cylinder oxygen pressures since the circuit requires higher FGFs during its use. There are certain suggestions regarding the cleaning and reuse of Bain circuits.^[5] But keeping in mind the possibility of viral transfer, it not advisable to reuse the Bain circuit for another patient in the present context. If required HMEFs should be changed only in the setting of malfunctions or if it is visibly soiled.^[6] As there is no data on maximum duration for safe use of HMEFs, the commonly acceptable duration to change those is 48h.^[7]

Thus, to conclude, we suggest a simple modification in the Bain's circuit for short duration patient transport

(especially when transport ventilator is not available) with minimal exposure of the concerned persons to aerosols.

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Conflicts of interest

There are no conflicts of interest.

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