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ROOM VENTILATION AND THE RISK OF AIRBORNE INFECTION TRANSMISSION IN A TERTIARY HOSPITAL

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Outdoor air ventilation is a key mechanism controlling the airborne spread of several diseases. However, ventilation guidelines for hospitals are not typically based on preventing infection transmission. **Aim:** We sought to assess the effectiveness of current ventilation rates on infection risks for influenza, tuberculosis (TB) and rhinovirus within three distinct rooms in a major tertiary hospital in Australia. **Methods:** The rooms targeted were a Lung Function Laboratory, negative pressure isolation room in the Emergency Department and an Outpatient Consultation Room. Air exchange measurements were performed in each by using CO_2 decay, and the proportion of outdoor air supplied was determined by CO_2 mass-balance at the air handling unit. Gammaitoni and Nucci's infection risk model, based on the traditional Wells-Riley model, was then employed to model scenarios typical of those experienced by patients. **Results**: Current outdoor air exchange rates in the Lung Function Laboratory and Isolation Room were appropriate, and infection risks for all modelled scenarios were <3.6%. Influenza risk for patients entering the OPD Room after an infectious patient departed ranged from 3.6 to 20.7% depending on the occupancy time of the susceptible and infectious patient. **Conclusions:** In the absence of definitive guidelines, air exchange measurements combined with modelling afford a useful means of assessing, on a case-by-case basis, the suitability of room ventilation at preventing airborne transmission.

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