

POSTER PRESENTATION

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P396: Balancing ventilation and energy use in hospitals: a case study of bioaerosol transport in healthcare environments

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Introduction

Hospitals are among the most energy intensive buildings in industrialized countries, using more than two-thirds of total energy consumption to maintain climate control and indoor air quality (IAQ). Yet, hospital acquired infections (HAIs) afflict approximately 8% of the inpatient population and claim more than 115,000 lives each year in Europe and the U.S. alone.

Methods

A series of 4 tests were conducted in an actual hospital to observe removal rates and containment of synthetic bioaerosols with respect to air change rate, air pressure differential and door position in a general patient room, and, an isolation patient room.

Results

Air change rates were not found to be effective in proportionately reducing aerosol concentrations within patient rooms when the aerosol was *continuously* released. Specifically, increasing mechanical ventilation rates from 2.5 to 5.5 air changes per hour (ACH) reduced aerosol concentrations only 30% on average. An air pressure differential of 2.5Pa, however, was found to be effective in containing aerosol transport from patient rooms to adjacent corridors *except* in cases where isolation anterooms were negatively pressurized with respect to isolation spaces. Door position and door motion was also found to have a significant effect on aerosol containment.

Disclosure of interest

None declared.

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