Category 1 :**Infections + Antimicrobials**

A189 - ***Assessment of the Variability of Airborne Contamination Levels in an Intensive Care Unit over a 24 Hour Period***

M Booth [1] ; L Dougall [2] ; E Khoo [3] ; H Hood [3] ; S MacGregor [2] ; M Maclean [2]

[1]Glasgow Royal Infirmary , Intensive Care Unit, Glasgow , United Kingdom, [2]University of Strathclyde, Department of Electronic and Electrical Engineering, Glasgow , United Kingdom, [3]University of Glasgow , School of Medicine, Dentistry and Nursing , Glasgow, United Kingdom

Introduction:

The objective of this study was to evaluate the variability in the dynamics and levels of airborne contamination within a hospital Intensive Care Unit in order to establish an improved understanding of the extent to which airborne bioburden contributes to cross-infection of patients. Microorganisms from the respiratory tract or skin can become airborne by coughing, sneezing and periods of increased activity such as bed changes and staff rounds. Current knowledge of the clinical microflora is limited however it is estimated that 10-33% of nosocomial infections are transmitted via air.

Methods:

Environmental air monitoring was conducted in Glasgow Royal Infirmary ICU, in the open ward and in patient isolation rooms. A sieve impactor air sampler was used to collect 500 L air samples every 15 minutes over 10 hour (08:00-18:00 h) and 24 hour (08:00-08:00 h) periods. Samples were collected, room activity logged and the bacterial contamination levels were recorded as CFU/m^3 of air.

Results:

A high degree of variability in levels of airborne contamination was observed over the course of a 10 hour day and a 24 period in a hospital ICU. Counts ranged from 12-510 CFU/m^3 over 24 hours in an isolation room occupied for 10 days by a patient with C. difficile infection. Contamination levels were found to be lowest during the night and in unoccupied rooms, with an average value of 20 CFU/m^3. Peaks in airborne contamination showed a direct relation to increased room activity.

Conclusion:

This study demonstrates the degree of airborne contamination that can occur in an ICU over a 24 hour period. Numerous factors were found to contribute to microbial air contamination and consideration should be given to potential improved infection control strategies and decontamination technologies which could be deployed within the clinical environment to reduce the airborne contamination levels, with the ultimate aim of reducing healthcare-associated infections from environmental sources.