**EV0395**
**ePoster Viewing**
**Susceptibility testing methods**

# Killing of Enterobacter cloacae (Ecl), E. coli (Ec) and Klebsiella pneumoniae (Kp) by pulmonary drug concentration of ciprofloxacin dry powder for inhalation (Cdpi)

Joseph M. Blondeau*[1], Shantelle Shebelski[2]

[1]*Royal University Hospital, Clinical Microbiology, Saskatoon, Canada*

[2]*Royal University Hospital, Microbiology Research, Saskatoon, Canada*

**Background:** Ciprofloxacin has broad spectrum activity against Gram-negative bacilli and Cdpi delivers high pulmonary drug concentrations of 35->409 µg/ml. Bacterial eradication impacts symptom resolution and clinical cure. We determined the rate and extent of killing Ecl, Ec and Kp clinical strains by the Cdpi pulmonary drug concentration over a range of bacterial densities ($10^6$-$10^9$ colony forming units/millilitre [cfu/ml]).

**Material/methods:** MIC and MPC values were measured for ciprofloxacin against clinical strains of Ecl, Ec and Kp. MIC testing used $10^5$ cfu/ml in appropriate media with doubling drug dilutions with incubation under optimal conditions (temperature and atmosphere) and MPC testing utilized $10^{10}$ CFUs on agar media containing drug in doubling dilutions with incubation under ideal conditions. The lowest drug concentration blocking growth was the MIC or MPC, depending on method. For kill measurements $10^6$-$10^9$ cfu/ml were exposed to pulmonary drug concentrations and the percent kill ($\log_{10}$ reduction) in viable cells measured at 30 minutes, 1, 2, 3, 4, 6, 12 and 24 hours.

**Results:** 3 strains each were used and all measurements were in triplicate resulting in 9 independent measurements per time point; results were averaged. For the Ecl $10^6$-$10^9$ cfu/ml, 63-77% (0.46-0.65 $\log_{10}$) were killed by 1 hr of drug exposure and this increased to 65-95% kill (0.5-1.3 $\log_{10}$) by 6 hr and 98-99% (0.63-5.9 $\log_{10}$) kill by 12-24 hr. For EC $10^6$-$10^9$ cfu/ml,75-81% (0.7-0.8 $\log_{10}$) by 1 hr, 75-95% kill (0.7-2.4 $\log_{10}$) by 6 hr and75-100% kill (0.66-6.4 $\log_{10}$) by 12-24 hr. For Kp ($10^6$-$10^9$ cfu/ml) 77-92% kill (0.64-1.28 $\log_{10}$) by 1 hr, 84-99% kill (0.82-2.75 $\log_{10}$) by 6 hr and 84-100% kill (0.85-7.49 $\log_{10}$) by 12-24 hr.

**Conclusions:** Cdpi was rapidly bactericidal against Ecl, Ec and Kp strains over low to high density bacterial burdens –burdens likely present during infection. Such findings are likely important for use of this formulation.