

# **Point-of-Care Intelligent Decision Support System for Antimicrobial Prescribing in the Intensive Care Unit**

Bernard Hernández, Pau Herrero, Luke Moore, Esmita Charani,  
Alison Holmes, Pantelis Georgiou

## **Introduction**

Antimicrobial resistance is now a major threat to patient safety and increasingly we are seeing patients infected with bacteria for which there are very few antimicrobials that remain effective. To conserve the effectiveness of antimicrobials it is necessary to develop ways to prescribe antimicrobials rapidly and more sensibly.

## **Methods**

ENIAPP (ENhanced Imperial Antibiotic Prescribing Policy application) is an intelligent clinical decision support system developed at Imperial College that uses past clinical cases to inform clinicians about effective antimicrobial prescribing in the intensive care unit (ICU). Cases are created by combining patient specific data automatically collected from NHS servers (i.e. microbiology and pathology) with other data manually inputted through a mobile device (tablet). An artificial intelligence technique (i.e. Case-Based Reasoning) is applied to analyse and compare patient's profiles and advice is provided at point of care. The back-end, developed in Java and SQL, runs in a server within the NHS firewall. Therefore any mobile device connected to a secure NHS Wi-Fi can access it through the web-based front-end application.

## **Results**

In a small 6-week pilot study conducted by infection specialists with a small case-base (approximately 80 cases), ENIAPP recommended the correct treatment 95% of the times.

## **Conclusion**

ENIAPP improves reliability and consistency of data collection, its visualization, interpretation and analysis at patient bed side. ENIAPP has potential to provide personalized, accurate and effective diagnostics and enhances continuity, interpersonal communication and knowledge transfer on antimicrobial prescribing at the ICU.