THE UNIVERSITY OF QUEENSLAND
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CRE RESPOND
CENTRE OF RESEARCH EXCELLENCE
Optimising and personalising antimicrobial dosing to reduce resistance

Population Pharmacokinetics: from fundamentals to clinical practice workshop

Wednesday 16 July – Friday 18 July 2025
UQ Brisbane City, 308 Queen Street, Brisbane, Queensland, Australia

PROGRAM

Wednesday 16 July: Introduction to Pharmacokinetics and Population Pharmacokinetics

Morning session:

- **09:00 – 09:30 h | Registration & Welcome**
  Welcome participants, introduce the workshop objectives, and outline the agenda.

- **09:30 – 10:30 h | Pharmacokinetics: Key Concepts for Beginners**
  A foundational session introducing the key principles of pharmacokinetics, focusing on absorption, distribution, metabolism, and excretion (ADME).

- **10:30 – 11:30 h | Understanding Pharmacokinetic Models**
  Introduction to compartmental modelling and parameterisation.

- **11:30 – 12:00 h | Morning Tea Break**

- **12:00 – 13:00 h | Introduction to Population Pharmacokinetics**
  Discuss the basics of population pharmacokinetics, including interindividual variability, residual error, and covariates.

- **13:00 – 14:00 h | Hands-on: Data Extraction**
  Identify and extract relevant data from a published population pharmacokinetic model

- **14:00 – 15:00 h | Lunch Break**

Afternoon session:

- **15:00 – 15:30 h | Building a dataset**
  Discuss key components and structure of a dataset for population pharmacokinetic modelling.

- **15:30 – 16:15 h | Hands-on: Building a dataset**
  Practical session where participants will build a basic dataset.

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Thursday 17 July 2025: Model Building and Validation

Morning session:

- **09:00 – 09:30 h | Recap and Overview of Day 2**
  Brief recap of Day 1 and an overview of the Day 2 agenda

- **09:30 – 10:30 h | Components of a Model File**
  Overview of the key elements in a model file, including the role of differential equations in defining pharmacokinetic models. Compare how different software platforms organise these components, highlighting the consistency of core information despite structural variations.

- **10:30 – 11:30 h | Hands-on: Writing a Model File**
  A practical session on developing a model file.

- **11:30 – 12:00 h | Morning Tea Break**

- **12:00 – 13:00 h | Model Development**
  Discuss of the steps involved in developing a pharmacokinetic model, from hypothesis generation to model selection and refinement. Emphasis on the importance of sampling times in parameter estimation.

- **13:00 – 14:00 h | Model Validation**
  Explore internal validation techniques (e.g., goodness-of-fit plots, visual predictive checks, and bootstrapping) and the importance of external validation using independent datasets.

- **14:00 – 15:00 h | Lunch Break**

Afternoon session:

- **15:00 – 16:00 h | Monte Carlo Simulations and Dosing Optimisation**
  Introduction to Monte Carlo Simulations and their role in pharmacokinetic analysis for dosing optimisation.

Friday 18 July: Clinical Application of Population Pharmacokinetics Models

Morning session:

- **09:00 – 09:30 h | Recap and Overview of Day 3**
  Brief recap of Day 2 and an overview of the Day 3 agenda

- **09:30 – 10:30 h | Software Demonstration**
  Demonstration of key software platforms, focusing on user interface, coding requirements, and ease of use.

- **10:30 – 11:00 h | Morning Tea Break**

- **11:00 – 13:00 h | Hands-on: Software Operation**
  Participants will work with the dataset and model file developed in previous sessions to operate relevant software.

- **13:00 – 14:00 h | Practical applications: dosing software in clinical settings**
  Demonstration of dosing software used in hospital pharmacy, with a focus on real-world applications, patient case studies, and best practices.

- **14:00 h | Q&A and Closing**

- **14:00 – 15:00 h | Lunch Break**

Afternoon session (Optional)
An optional session where participants can work on their own dataset with guidance from tutors.

If you have any questions, please contact cre.respond@uq.edu.au