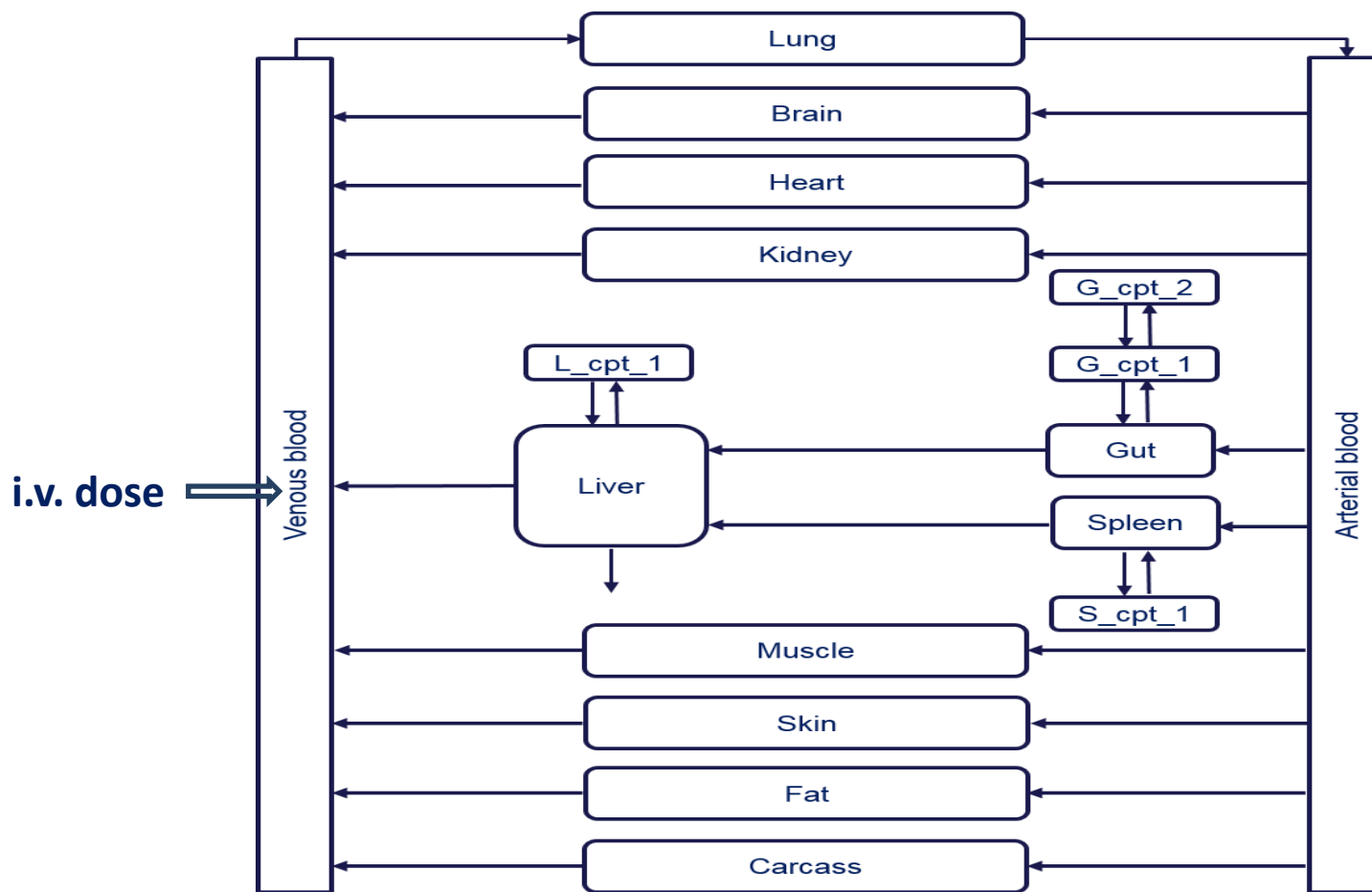


Illustrative example

PBPK of Fentanyl

Shan Pan
Vittal Shivva
Stephen Duffull

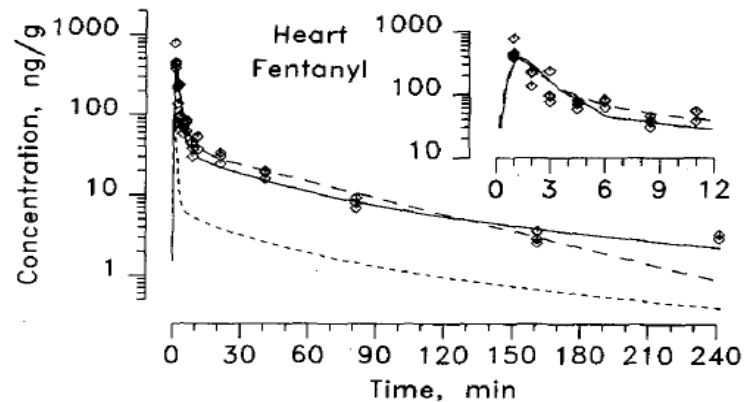
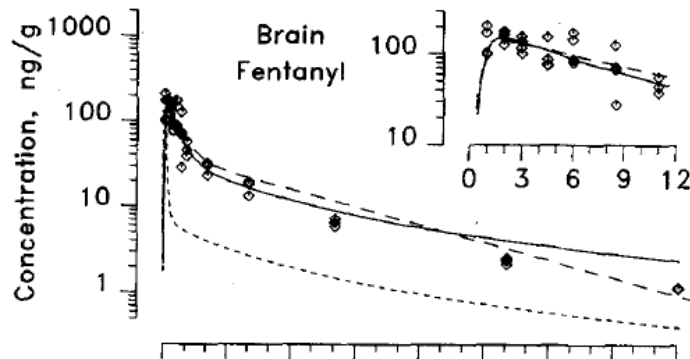
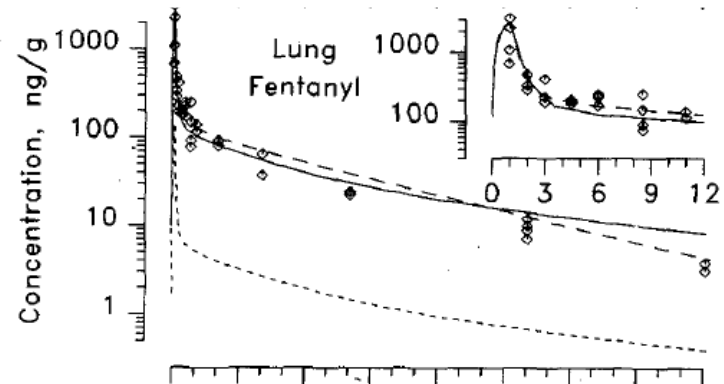
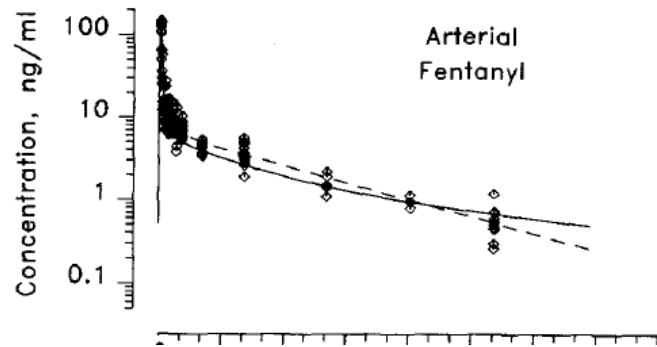
Original fentanyl human PBPK model



Björkman et al, J Pharmacokinetic Biop 1994

Rat profiles

- Rat parameter values to test human model

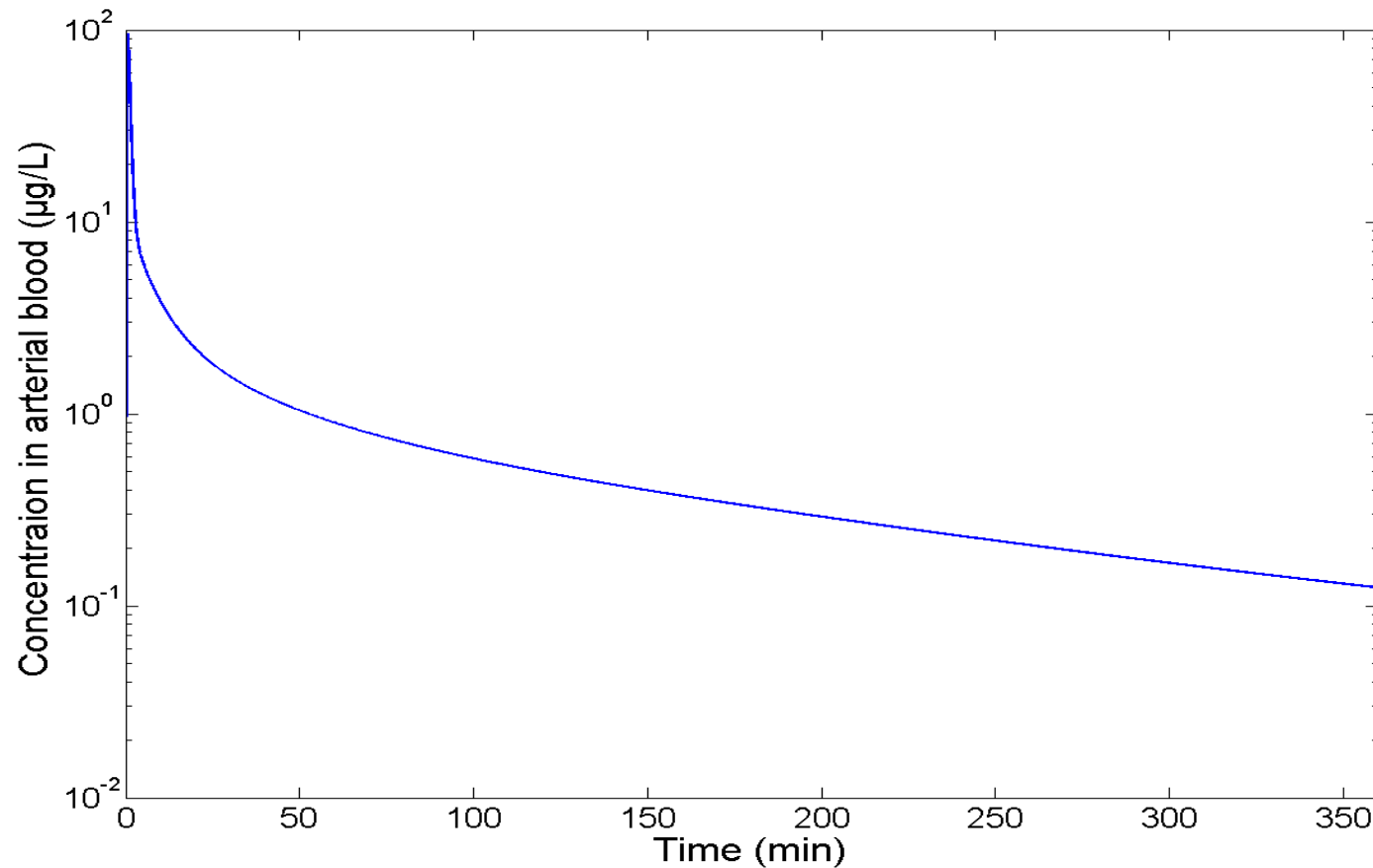


Time, min
Björkman et al, J Pharmacokinetic Biop 1994

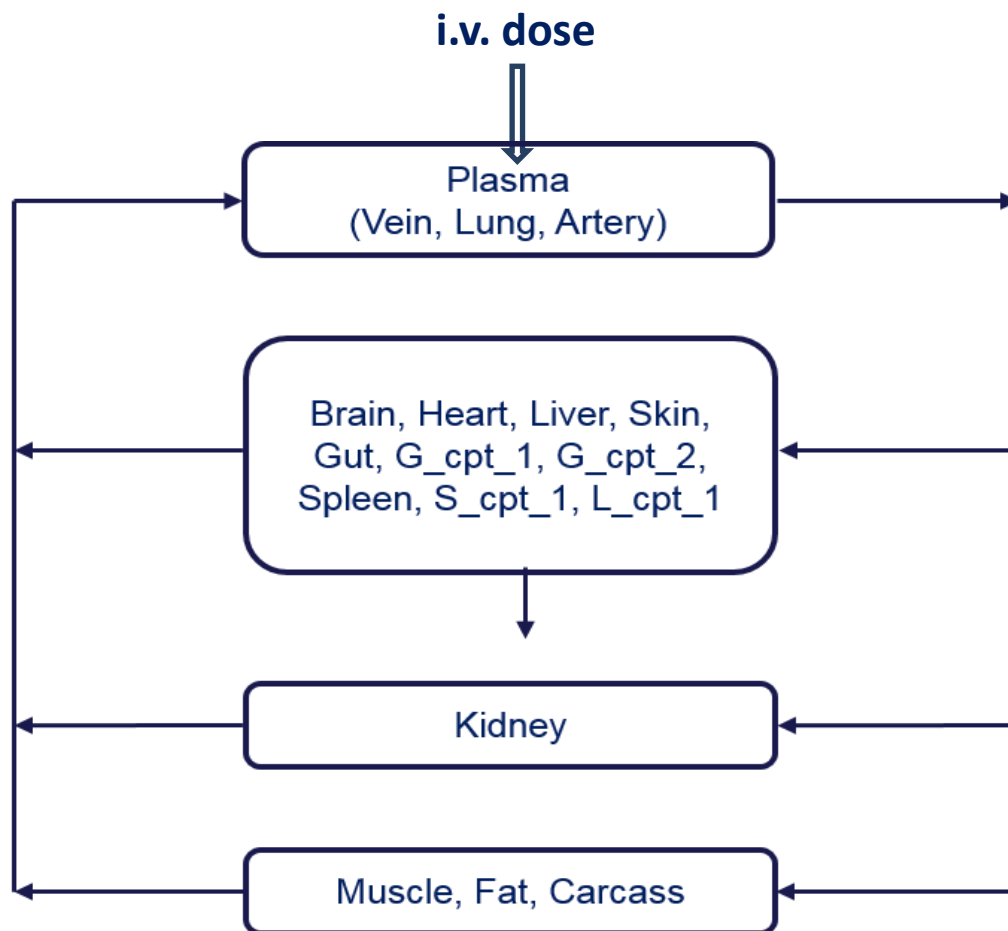
Why PBPK? Why Lump?

- To get predictions of the concentration-time profile in human tissues scaled from rat data:
 - PBPK experiment in animals
 - Model parameters
 - Develop PBPK model for animals
 - Using human blood flows and tissue weights, scale the parameters to humans
- Lump scaled human PBPK model:
 - If we're only interested in 1 tissue then develop a simpler structure
 - Lump tissues we're not interested in

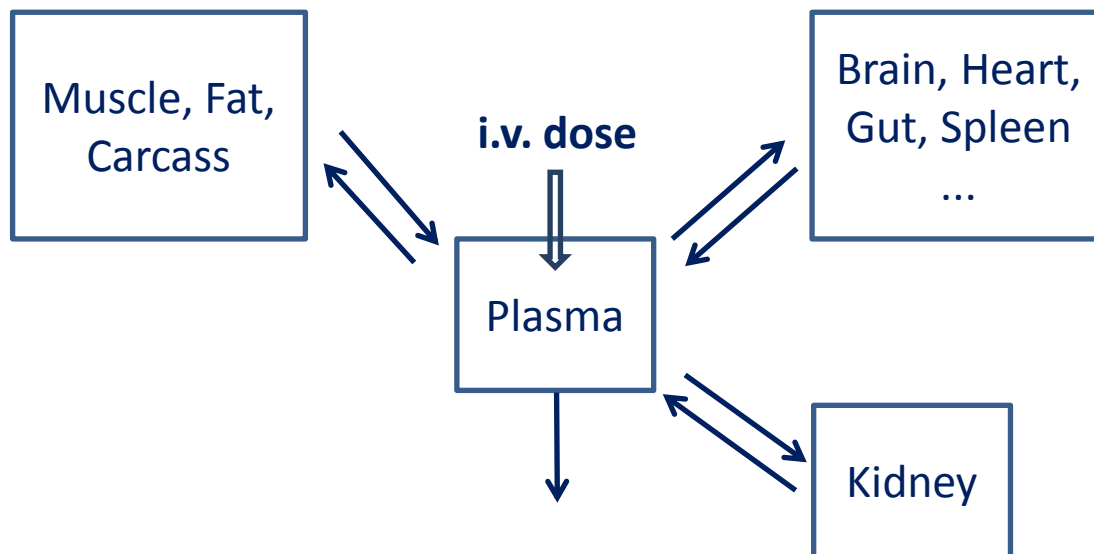
Simulated plasma profile from full PBPK model



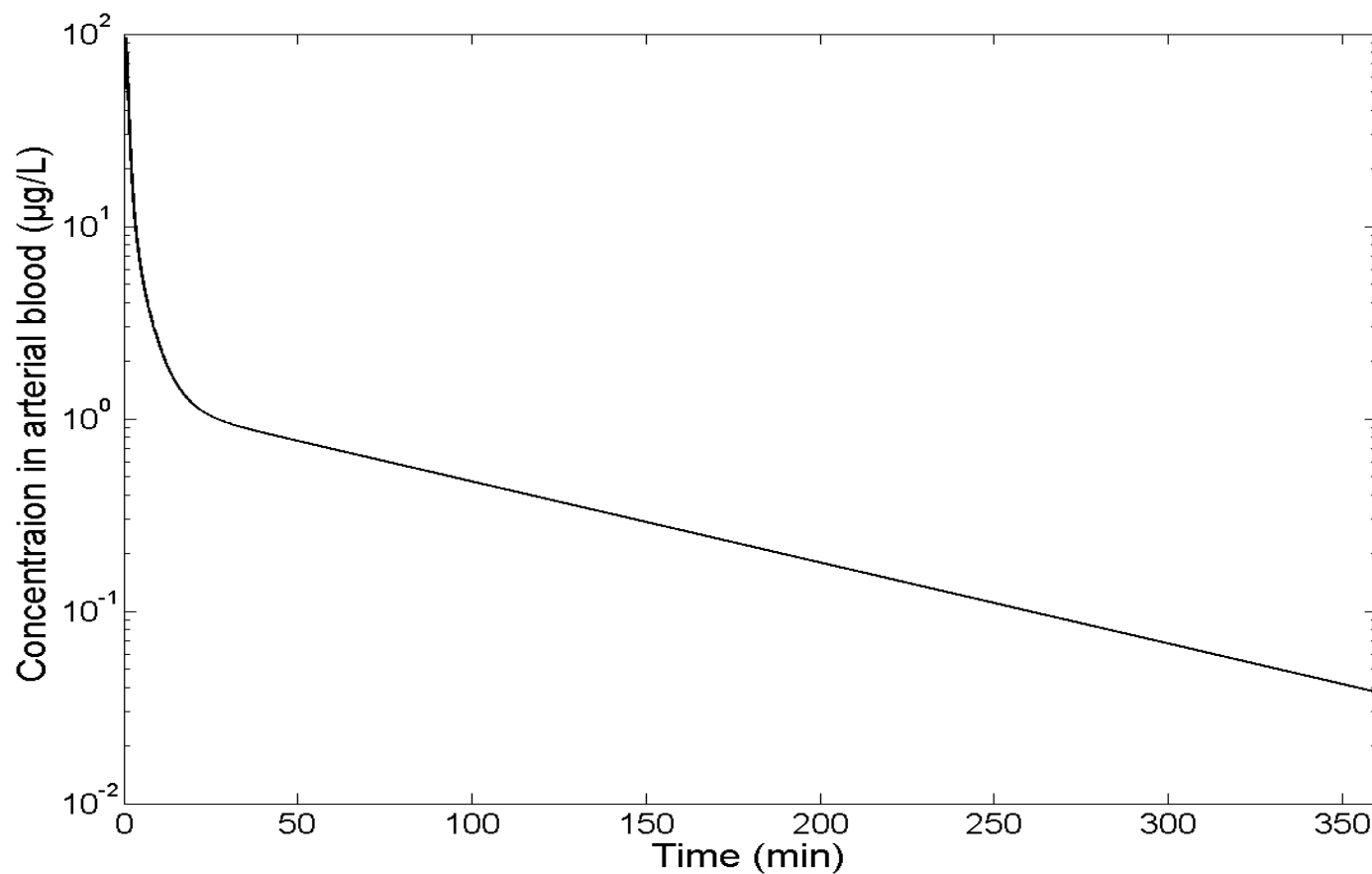
Simplified fentanyl human PBPK model



Simplified fentanyl human PBPK model



Simulated plasma profile from lumped model



Simulated profiles from full & lumped models

