First 2009
VIVA 6

This viva will explore your knowledge of the pharmacokinetics in two areas: 1. Alcohol 2. Ageing
What is the pharmacokinetics of alcohol metabolism?

"What are the pharmacokinetics of alcohol metabolism?"

Alcohol is absorbed rapidly across cell membranes (stomach 70%, duodenum 30%)
First pass metabolism is roughly 20%, resulting in a bioavailability of around 80%
Peak absorption occurs within 20 mins (increased if fasting) and total absorption 90mins
It has a relatively large volume of distribution and crosses the BBB
it is metabolised in the liver via alchohol dehydrogenase to acetylaldehyde
this is further metabolised into acetate by aldehyde dehydrogenase
most text indicate metabolism demonstrates zero order kinetics at normal doses
it is excreted in the urine as metabolites

"What is the difference between zero order kinetics and first order kinetics?"

First order kinetics indicate that rate of clearance is dependent on drug concentration
Zero order kinetics indicate that the rate is independent of drug concentration
Other examples of drugs with zero order kinetics include phenytoin and aspirin

"Define volume of distribution and show how loading doses may be calculated"

Vd is the total amount of drug in the body divided by the plasma concentration
Loading dose = Vd x desired plasma concentration

"What changes are expected in the elderly with respect to pharmacokinetics?"

Pharmacokinetic changes result from changes in body composition and renal/hepatic function
reduction in lean body mass coupled with the increase in percentage of body fat
reduced serum albumin and total body water
clearance of many drugs is reduced in the elderly
Renal function variably declines to ~50% of that in young adults
Hepatic blood flow and drug metabolism vary considerably
activity of hepatic CYPs are reduced
but conjugation mechanisms are relatively preserved