Organ Dysfunction & Drug Elimination

1. How do renal and hepatic dysfunction affect elimination in general?

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## Renal disease

Clearly renal disease has vast systemic consequences; however, two main affects are thought to be important for elimination:

1. Reduced filtration (quantified by creatinine clearance estimations)  
   *Maintenance doses often need to be reduced*
2. Volume of distribution may be **the same** or **increased***Loading doses remain similar or, paradoxically, may need to be increased*

Appropriate doses should be chosen by either:

1. Looking in the BNF
2. Titrating drug to effect (*i.e. beta blockers for AF, warfarin*)
3. Measuring levels (*i.e. vancomycin, gentamicin, digoxin*)

An approximation that may be quoted is:

*Whether this is helpful to the jobbing clinician is debatable.*

## Hepatic disease

Hepatic disease has a whole host of effects but unfortunately, unlike renal disease, these are not easily quantified:

1. Reduced metabolic capacity
   1. Reduced phase 1 & 2 reactions
   2. Portocaval shunting bypasses first-pass metabolism
2. Reduced synthetic function
   1. Decrease plasma proteins & therefore decrease protein binding
   2. Decreased clotting factors
3. Increased volume of distribution
   1. Ascites
   2. Whole body fluid increased
4. Other organ dysfunction
   1. Renal dysfunction
   2. Tendency to delirium

There is no clear single strategy that allows compensation for this.