LG: Feb. 21, 2017.

Housekeeping.

- HW 8 due today
- HW 9 due Thursday.

Last time: Constrained population growth

QUESTIONS?

This time: Module 2.5 (drug dosage)

Pharmacokinetics is the quantitative science related to determining the correct / effective dosages for medicines and drugs — this science must consider:

- absorption
- distribution
- metabolism
- elimination

As a first attempt to model the metabolism of a drug in the human body, we might make the simplifying assumption that the body is a single, homogeneous compartment, where • distribution of the drug is instantaneous; • the concentration of the drug in the system (conc. = $\frac{\text{amt. of drug}}{\text{volume of blood}}$) is proportional to the drug's dosage; • the rate of elimination is proportional to the amt. of drug in the system.

This set of assumptions is called the ONE-COMPARTMENT MODEL.

When making any simplifying assumptions, it is useful to think of real-world situations that VIOLATE those assump'ns — that's where you should not use your model — and to think of situations where those assump'ns do hold (or might?) — that's where your model will be most useful.

VIOLATE: Extended-release drugs (inst. distribut'n)

UPHOLD:

Note on concentration vs. amount / absolute quantity:

The absolute qty. of drug that's effective for a small child, for example, might not be effective for an adult (conversely, the qty. effective for an adult might be toxic/excessive for a child). This should tell us that quantity alone is not as effective a parameter as quantity, relative to the size of the patient.

If we assume the drug travels in blood, then "size of patient" is best characterized by "volume of blood". So the parameter that's most effective has smth. to do with