

BACCALAURÉAT-Session 2015

Epreuve de Discipline Non Linguistique

Mathématiques/Anglais

Pharmacokinetics

To produce its characteristic effects, a drug must be present in appropriate concentrations at its sites of action.

Pharmacokinetics is the study of what the body does to foreign substances. It looks at how the human body absorbs, distributes and eliminates drugs.

Clinical pharmacokinetics helps to decide the correct dose needed for effectiveness.



Imagine that each morning a patient must take a pill containing 50 mg of a certain medicine. Assume that the medicine is immediately introduced to his system. One of the things that our bodies do is to wash stuff out of our systems. In this process, 40% of the medicine taken by the patient is eliminated on the following morning when one must have another tablet.

www.forcon.ca/learning/pharmakocinetics.html

Questions

- 1) Make a short presentation of the text.
- 2) For all natural number n , let's call u_n the quantity of medicine one had in one's body the day $n+1$ after taking one's pill.
 - a) Calculate u_0 , u_1 and explain what they represent. Find a relation between u_{n+1} and u_n .
 - b) We are going to introduce the sequence defined for $n \geq 0$ by $v_n = u_n - 125$. Prove that (v_n) is a geometrical sequence, give its characteristics and express v_n as a function of n .
 - c) Show that, for all natural number n , $u_n = -75 \times (0,6)^n + 125$
 - d) If the patient must take this treatment all his life, do you think that the quantity of medicine in one's body will increase indefinitely?
- 3) Do you think selling drugs on the Internet should be allowed ?