The aim of this thesis is to formulate the basic pharmacokinetic model, describe its properties and to introduce an example use of this model. To describe the situation we use a system of ordinary differential equations and afterwards we analyze its properties, especially uniqueness and stability. To solve the system in the example, we use MATLAB software and we compare different methods of solving the system. We will determine that our problem is *stiff*. It will be visible from our MATLAB results as well as from the eigenvalues of the linearized system.