SCUDEM 2017 Problem B - Drug Interactions

Patients undergoing medical treatment may be given a combination of drug therapies, and the information about the interaction between drugs can be limited[1]. One commonly prescribed class of drugs is diuretics which promote kidney function as a way of removing water and sodium from the circulatory system. The way that a diuretic can interact with other drugs can be quite complicated and depends on the type of diuretic.

We ask that you examine the simpler issues of the reduction or removal of a compound from within a patient's system. A drug can be reduced within a patient’s system in several different ways. For example, it can be metabolized and broken down within the liver, and a patient's kidneys can directly remove it from the bloodstream.

You are asked to provide an analysis that will give direct guidance for the administration of a drug. The patient will be given a diuretic to relieve symptoms associated with heart disease. At the same time a patient will be given another drug to help treat other symptoms. The goal is to maintain a consistent level of both drugs within a patient's circulatory system.

The issue is that the diuretic will promote a more rapid removal of both drugs from the patient's system, but at the same time the other drug must be maintained at levels that are effective and safe. The medical staff would like to know how to balance the administration of the two drugs. They need to know what schedule and what dosages are appropriate for a given situation.