

## Deformation and Fracture Mechanics of Engineering Materials

Pharmacokinetics is concerned with what your body does with a drug. Think about what happens when you eat food. The food travels from your mouth to your stomach and then to your intestines. Along each step of the process, the food is broken down, nutrients are absorbed, and waste is removed. A similar process occurs with drugs. Determining how the drug is absorbed, distributed throughout the body, broken down, and then eliminated is what constitutes pharmacokinetics. Pharmacokinetics is based on ADME: absorption, distribution, metabolism, and elimination.

Pharmacokinetics is especially crucial for understanding the proper dose to take as well as the safety of a drug. Imagine that you currently take 2 medications. One medication is for your diabetes and another is for your blood pressure. And then you contract an infection that requires antibiotics. It is essential to let your doctor know about your current medications. Otherwise, you may risk a serious complication if your doctor prescribes a drug to clear the infection that lessens the effect of your other medications or causes a dangerous interaction between medications. Pharmacokinetic testing, which means testing to determine how the body handles a drug, is one of the first steps in the FDA regulatory process for getting a new drug approved.

### Pharmacodynamics

Pharmacodynamics is concerned with how the drug works on the body. When you take a medication, you expect a certain reaction to occur. Maybe you have a headache and pop an ibuprofen. You are relying on that drug to help squash the pain and make you feel better. Pharmacodynamics is the second piece of pharmacology and is responsible for ensuring that the drug works like it is supposed to. Efficacy, or the ability to cause a favorable change, is the end goal for all drug development. Pharmacodynamics assures the overall effect of a drug, such as curing a headache or clearing an infection, while maintaining safety. The FDA also requires several pharmacodynamic trials to determine how a drug works on the body before a drug can be approved.

### Lesson Summary

Pharmacology is the study of drugs and concentrates on the safety and efficacy of medications before they are approved by the FDA. Pharmacology is made up of two areas of study: pharmacokinetics and pharmacodynamics. Pharmacokinetics focuses on how the body breaks down the drug, whereas pharmacodynamics ensures that the drug works on the body like it should. The overall goal of pharmacology is to develop safe and effective drugs that provide a favorable benefit to the patient.

## Reference

[Handbook of Cosmetic Science and Technology](#)

[Systems Engineering Principles and Practice](#)