

passive diffusion across a biologic barrier and into the circulation. The rate of absorption is proportional to the drug concentration gradient across the barrier and the surface area available for absorption at that site, known as Fick's Law. Drugs can be absorbed passively through cells either by lipid diffusion or by aqueous diffusion (Finkel et al., 2009). Lipid diffusion is a process in which the drug dissolves in the lipid components of the cell membranes. This process is facilitated by a high degree of lipid solubility of the drug. Aqueous diffusion occurs by passage through aqueous pores in cell membranes. Because aqueous diffusion is restricted to drugs with low molecular weights, many drugs are too large to be absorbed by this process. A few drugs are absorbed by active transport or by facilitated diffusion. Active transport can transfer drugs against a concentration gradient (Finkel et al., 2009).

Distribution of a drug refers to the process of a drug leaving the blood stream and going into the organs and tissues. Drugs are distributed to organs and tissues via the circulation, diffusing into interstitial fluid and cells from the circulation (Boullata & Armenti, 2010). Most drugs are not uniformly distributed throughout total body water, and some drugs are restricted to the extracellular fluid or plasma compartment. The delivery of drug from blood to the interstitium primarily depends on blood flow, capillary permeability, the degree of binding of the drug to plasma and tissue proteins, and the relative hydrophobicity of the drug.

Drug metabolism and excretion are the two processes responsible for the decline of the plasma drug concentration over time (Alavijeh et al., 2005). Both of these processes contribute to the elimination of active drug from the body, most drug metabolism takes place in the liver, but drug-metabolizing enzymes are found in many other tissues including the gut, kidneys, brain, lungs, and skin (Kanter et al., 2002). The major role of drug-metabolizing enzymes is to inactivate and detoxify