All absorbed…

Nitrates given sublingually (under the tongue), buccally (in the pocket of the cheek), as chewable tablets, as lingual aerosols (sprayed onto or under the tongue), or by inhalation (amyl nitrite) are absorbed almost completely because the mucous membranes of the mouth have a rich blood supply.

…Half-absorbed…

Swallowed nitrate capsules are absorbed through the mucous membranes of the GI tract, and only about one-half of the dose enters circulation.

Transdermal nitrates (a patch or ointment placed on the skin) are absorbed slowly and in varying amounts, depending on the quantity of drug applied, the location of its application, the surface area of skin

used, and circulation to the skin.

…Or no absorption required

I.V. nitroglycerin, which doesn't need to be absorbed, goes directly into circulation.

Pharmacodynamics

Nitrates cause the smooth muscle of the veins and, to a lesser extent, the arteries to relax and dilate. This is what happens:

- When the veins dilate, less blood returns to the heart.
- This, in turn, reduces the amount of blood in the ventricles at the end of diastole, when the ventricles are full. (The volume of blood in the ventricles just before contraction is called

preload.)

- By reducing preload, nitrates reduce ventricular size and ventricular wall tension (the left ventricle doesn't have to stretch as

much to pump blood). This, in turn, reduces the oxygen requirements of the heart.

Don't fight it

The arterioles provide the most resistance to the blood pumped by the left ventricle (called *peripheral vascular resistance*). Nitrates decrease afterload by dilating the arterioles, reducing resistance, easing the heart's workload, and easing the demand for oxygen.