

JULY 2008  
QUESTION 20

Compare and contrast the pharmacology of sodium nitroprusside and glyceryl trinitrate

	Sodium nitroprusside	Glyceryl Trinitrate
	Is an inorganic complex that acts as a prodrug, with five CN groups and one NO group attached to an iron molecule covalently bonded to sodium	Is an organic nitrate.
Pharmaceutical	injectable only Is unstable and must be stored out of light	SL, patch and injectable. must be stored in glass vials due to absorption into some plastics
Pharmacodynamics mechanism	NO in SNP reacts with SH groups in vascular smooth muscle stimulating cGMP and causing generalised vasodilation.	nitrate combine with thiol to produce NO which reacts with cGMP and causes vasodilation
systems	Acts on both arterial and venous equally Attenuates HPV in lungs Increases ICP due to increase in CBF Renal blood flow maintained	Venous dilation is greater than arterial Can cause bronchodilation Increases ICP due to increase in CBF May disrupt renal autoregulation in CCF pts
Pharmacokinetics Absorption	IV only	V.high first pass metabolism (up to 95%) Rapid absorption via other routes
Distribution	not known	moderate volume of distribution 60% protein binding
Metabolism	rapidly metabolised in the blood stream to prussic acid then thiocyanate	rapidly metabolised hepatically via thiols
Elimination	half life of 2-4 minutes urine (inactive)	half life is 2-4 minutes urine (inactive)
Side effects	excessive hypotension nausea, vomiting and abdo pain rebound hypertension on cessation long term risks with cyanide accumulation impaired oxidative phosphorylation	excessive hypotension patients develop tolerance, requiring breaks may develop methemoglobin (decreased O2 carrying capacity)