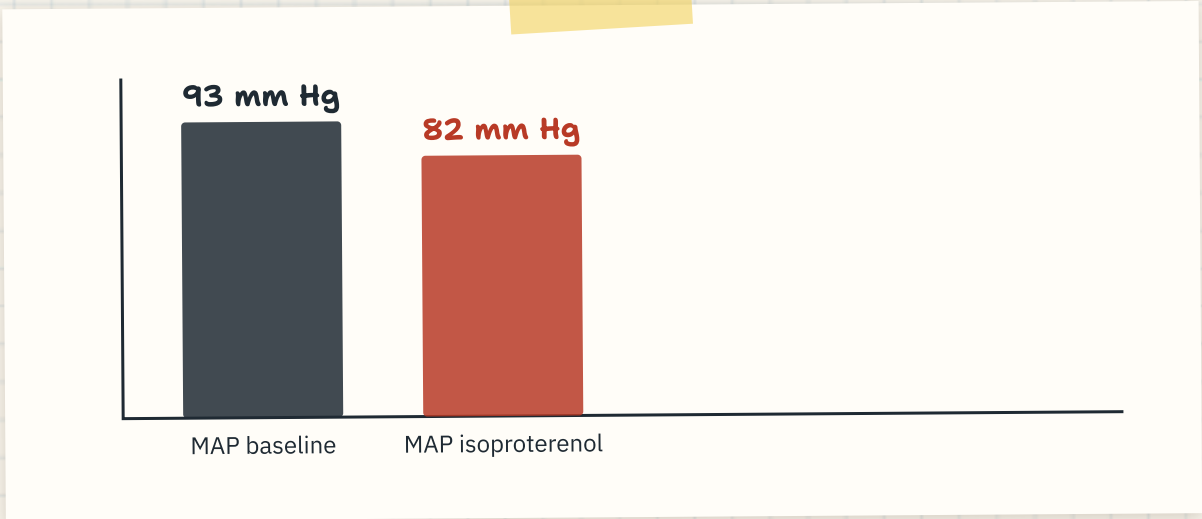
Vasopressors compared

Receptors predict pressure and heart rate



Step by step

1. Name the receptors
2. Squeeze (α1) or dilate (β2)?
3. Estimate the change in MAP
4. Baroreflex: HR goes against pressure

ESTIMATING MAP

$$MAP \approx DBP + (SBP - DBP) / 3$$

MAP ≈ CO × SVR; the baroreflex moves heart rate against pressure

Drug	Receptors	MAP / HR
Phenylephrine	α1	MAP up, HR down
Norepinephrine	α1 > β1	MAP up, HR little change
Isoproterenol	β1 = β2	MAP down, HR up
Epinephrine	α1, β1, β2	low dose β, high dose α
Epi after α-blocker	β1, β2	MAP down, HR up

Receptor profile and effect

Rule of thumb

Pure alpha-1: pressure up, heart rate down

Beta-1 plus beta-2: mean pressure down, heart rate up

Block alpha, and epinephrine reverses

Exam traps

- Phenylephrine raises pressure but slows the heart.
- Isoproterenol lowers diastolic and mean pressure.
- An alpha blocker turns epinephrine into an isoproterenol-like drug.

Vasopressors compared: receptors, pressure and heart rate

Video, written lesson, practice question and sources: medservatory.com/usmle-step-1/pharmacology-principles-autonomic/vasopressors-compared-norepinephrine-epinephrine-phenylephrine-isoproterenol

For exam study only, not medical advice. Follow local guidelines and your lab's ranges.
© 2026 Medservatory, a project of ADMR Solutions Ltd. Free to print and share for personal study.