VASOPRESSORS

Squeeze the pipes · receptor pharmacology & the ladder

MAP
≥ 65

THE RECEPTORS

where vasopressors act

α_1
Vascular smooth muscle
vasoconstriction, ↑ SVR / BP

β_1
Myocardium
modest inotropy / chronotropy

β_2
Vessels & bronchi
vasodilation (unwanted here)

V_1
Vessels (vasopressin)
non-adrenergic, works in acidosis

AT_1
Angiotensin receptor
renin-axis vasoconstriction

AGENT ACTIVITY & DOSING

receptor strength +++ strong to - none

Agent	α_1	β_1	Other	Dose	First choice for
Norepinephrine	+++	++	-	0.05-0.5 mcg/kg/min	Septic & most vasodilatory / undifferentiated shock
Vasopressin	-	-	V_1 +++	0.03 U/min fixed	Catecholamine-sparing adjunct to norepinephrine
Adrenaline	+++	+++	β_2 ++	0.01-0.5 mcg/kg/min	Anaphylaxis, arrest, refractory septic shock
Phenylephrine	+++	-	-	0.1-0.5 mcg/kg/min	Tachyarrhythmia; transient / bolus hypotension
Angiotensin II	-	-	AT_1 +++	start 20 ng/kg/min	Catecholamine-refractory vasodilatory shock
Dopamine	dose	++	D_1 (low)	2-20 mcg/kg/min	Rarely; only select bradycardic shock

SEPTIC SHOCK LADDER

escalate for MAP ≥ 65 despite fluids

1 NOREPINEPHRINE — First-line. Titrate to MAP ≥ 65. Start peripherally if central access is delayed.

2 + VASOPRESSIN 0.03 U/min — Add when norepinephrine reaches ~0.25-0.5 mcg/kg/min. Reduces catecholamine load.

3 + ADRENALINE (or angiotensin II) — For refractory vasodilatory shock on norepinephrine + vasopressin.

4 + HYDROCORTISONE 200 mg/day — Add if ongoing vasopressor requirement. Reassess perfusion and de-escalate.

Vasopressor load (norepinephrine-equivalents): NE 1 = adrenaline 1 = phenylephrine 10 = dopamine 100 (mcg/kg/min) ≈ vasopressin 0.04 U/min. Refractory ≈ NEE > 0.5 - escalate, add steroid, reassess Ca / acidosis / source.

AT THE BEDSIDE

PERIPHERAL & EXTRAVASATION

Norepinephrine may run short-term through a good proximal peripheral line while central access is obtained. Watch the site; antidote for extravasation is phentolamine (or topical GTN).

MAP TARGET

≥ 65 mmHg (60-65 if age ≥ 65). Individualise higher in chronic hypertension. Titrate to perfusion, not the number: lactate clearance, urine output, mentation.

MONITOR & COMPLICATIONS

Arterial line for accurate pressure. Watch for tachyarrhythmia, digital and mesenteric ischaemia, hyperglycaemia. Reassess need and de-escalate daily.

PEARLS & PITFALLS

- Norepinephrine is first-line for nearly all vasodilatory and undifferentiated shock - reach for it early.
- Start peripherally to avoid delay - do not withhold vasopressors while waiting for central access.
- Vasopressin is fixed-dose: do not titrate it up as a rescue pressor; escalate a different agent instead.
- Refractory shock: reassess for adrenal insufficiency, acidosis, hypocalcaemia and an untreated source.

References: Surviving Sepsis 2021/2026 · ATHOS-3 2017 · SOAP II 2010 · VASST (vasopressin).

Educational aid; verify doses against local protocol and patient factors.