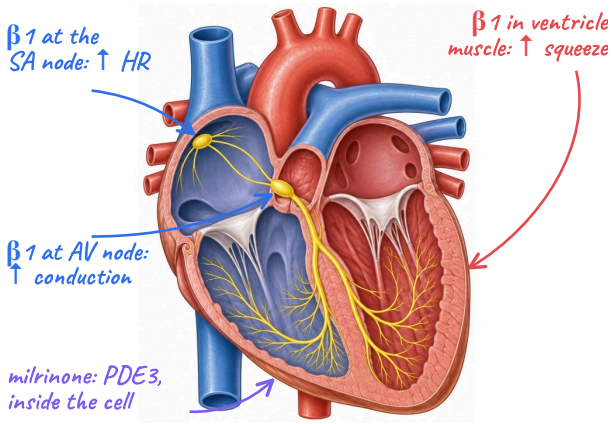
ER BASICS · ONE-PAGER

Vasopressors and Inotropes

Receptors, doses, SSC 2026 septic shock order, push-dose pressors and extravasation

28 sources + more detail
erbasics.com/sheets/vasopressors.html
checked Nov 2026

TARGETS Where the drugs act: heart and vessels



1 Receptors and effects

Vasopressors raise SVR; inotropes boost contraction; some do both. α1, V1 and AT1 receptors constrict vessels. β1 raises HR and contractility. β2 and dopamine D1 dilate vessels.

DRUG	RECEPTORS	HR / CONTRACTILITY / SVR
Norepinephrine	α1 > β1 (little β2)	↔ / ↑ / ↑↑
Epinephrine	β1, β2, α1	↑↑ / ↑↑ / ↑ (↓ at low dose)
Vasopressin	V1 (V2 in kidney)	↔ or ↓ / ↔ / ↑↑
Phenylephrine	α1 only	↓ reflex / ↔ / ↑↑
Dopamine	DA <5, β1 5–10, α1 >10 mcg/kg/min	↑ / ↑ / ↑ at high dose
Dobutamine	β1 > β2	↑ / ↑↑ / ↓
Milrinone	PDE3 inhibitor (no receptor)	↔ / ↑↑ / ↓
Angiotensin II	AT1	↔ / ↔ / ↑↑

EXAM TIP Exam favorites: dobutamine and milrinone are inodilators that can drop BP; vasopressin and angiotensin II are not catecholamines; low-dose 'renal' dopamine does not protect the kidneys. In LVOT obstruction (HOCM), avoid inotropes and give phenylephrine.

2 Typical adult doses

Study ranges from FDA labeling, for exam prep only. Follow your institution's protocols, concentrations and titration limits.

DRUG	TYPICAL ADULT RANGE
Norepinephrine	Start 8–12 mcg/min; label maintenance 2–4; shock often needs more
Epinephrine	0.05–2 mcg/kg/min (septic shock)
Vasopressin	0.03 units/min, usually fixed (label 0.01–0.07)
Phenylephrine	10–35 mcg/min, max 200; bolus 40–100 mcg
Dopamine	Start 2–5 mcg/kg/min; label max 50
Dobutamine	2–20 mcg/kg/min, rarely up to 40
Milrinone	Load 50 mcg/kg over 10 min, then 0.375–0.75 mcg/kg/min; reduce by CrCl
Angiotensin II	Start 20 ng/kg/min; ≤80 first 3 h, then ≤40

Many ICUs dose norepinephrine in mcg/kg/min, as guideline thresholds do. Angiotensin II is in nanograms.

3 Uses and adverse effects

DRUG	CLASSIC USE	WATCH FOR
Norepinephrine	First line in septic shock	Extravasation necrosis, limb ischemia, arrhythmias
Epinephrine	Anaphylaxis (IM first), arrest, septic shock add-on	Tachyarrhythmias, ischemia, ↑ lactate, ↑ glucose
Vasopressin	Add-on in vasodilatory shock	Digital and gut ischemia, ↓ Na, ↓ HR, ↓ CO
Phenylephrine	Anesthesia hypotension; LVOT obstruction	Reflex bradycardia, ↓ CO
Dopamine	Bradycardia after atropine	More arrhythmias than norepinephrine
Dobutamine	Low output with adequate MAP	Tachycardia, ectopy, hypotension
Milrinone	Low output, including on β-blockers	Hypotension, arrhythmias, builds up in AKI
Angiotensin II	Add-on in septic or distributive shock	Thrombosis (give VTE prophylaxis); central line advised

4 Septic shock order (SSC 2026)

1. Crystalloid at least 30 mL/kg in 3 h, balanced over 0.9% saline; then norepinephrine if still hypotensive. Unstable: start both together.
2. Initial MAP target 65 mm Hg (60–65 if age 65 or older).
3. Norepinephrine is first line, not dopamine. With cardiac dysfunction: norepinephrine or epinephrine.
4. Norepinephrine climbing: add vasopressin. SSC 2026 sets no threshold (the panel's median start was about 0.3 mcg/kg/min; the 2021 remark said 0.25–0.5).
5. MAP still low: add epinephrine.
6. Hypoperfusion from cardiac dysfunction despite adequate volume and MAP: add dobutamine, or use epinephrine alone.
7. IV corticosteroids are suggested; the usual regimen is hydrocortisone 200 mg/day (SSC 2021 remark).

Guide resuscitation with capillary refill and serial lactate (epinephrine raises lactate itself). Suggested against: terlipressin, levosimendan, beta-blockers.

EXAM TIP Exam pattern: fluids plus norepinephrine, then vasopressin, then epinephrine. Dobutamine treats poor output once MAP is adequate; it is never the pressor.

5 Push-dose pressors

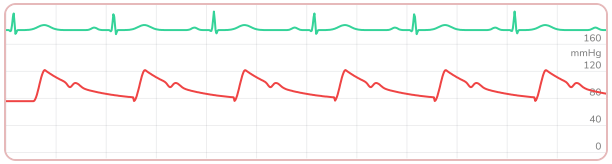
Small IV boluses that bridge brief hypotension, such as around intubation, until an infusion runs. Evidence is mostly observational and doses vary: follow your institution's protocols.

- Epinephrine 10 mcg/mL: 10–20 mcg (1–2 mL), about every 3 min.
- Phenylephrine 100 mcg/mL: 40–100 mcg; repeat up to 200 mcg every 1–2 min (anesthesia labeling).

SAFETY Push-dose epinephrine is micrograms, not the 1 mg arrest dose. Bedside dilution errors cause overdoses: use prefilled or clearly labeled syringes and an independent double-check.

6 Lines, extravasation and titration

- Start peripherally rather than delay for a central line (SSC 2026, which sets no site, dose or duration limits).
- Typical protocols: 20 G or larger in a large proximal arm vein; avoid the hand and wrist.
- Check the site often (hourly in many protocols); go central if the infusion runs long or doses climb.
- Treat hypovolemia (the label says before starting), or vasoconstriction causes ischemia.
- Titrate to MAP: noninvasive BP is acceptable; use an arterial line for high, rising or multiple pressors. Wean gradually.
- Dedicated line: never flush or push anything through it. Double-pump bag changes: start the new bag on a second channel before stopping the old one.



A well-damped trace: brisk upstroke, clear but not exaggerated dicrotic notch, no ringing. Confirm with a fast-flush test.

SAFETY Extravasation: stop the infusion, aspirate, remove the catheter, mark and elevate. For catecholamines or phenylephrine, infiltrate phentolamine 5–10 mg in 10–15 mL saline subcutaneously as soon as possible (label: within 12 h). Alternatives: terbutaline or topical nitroglycerin.

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