Vasopressor Administration via Peripheral IV

Section Editor: seat open
Chief Editor: Maged Tanios, MD

Version 0.1 · Last reviewed 2026-07-19

Disclaimer: This protocol is an educational reference intended to support — not replace — institutional policy, pharmacy and therapeutics review, and individual clinical judgment. Verify current dosing, contraindications, and local formulary/practice constraints before adopting into an EMR or using in patient care.

Overview

Vasopressors were traditionally restricted to central venous catheters (CVCs) after early case reports of extravasation-related tissue injury. Peripheral administration is now well-studied: in a 635-patient prospective study, over half of patients avoided CVC placement entirely, with a low extravasation rate (5.5%) and no case requiring surgical intervention. SSC 2026 explicitly supports peripheral vasopressor start to avoid delaying perfusion restoration while central access is obtained. The tradeoff is operational, not just clinical: safe peripheral use depends on a defined site/gauge standard, dedicated monitoring, and a clear extravasation response — not on the drug itself.

Steps

01 Confirm the Patient Is a Candidate

- Norepinephrine is first-line and the best-studied agent for peripheral use; phenylephrine has also been used peripherally at some centers.
- Anticipated short duration and a single vasopressor agent. Two or more vasopressors, or an anticipated prolonged course, is a peripheral contraindication (Step 5).
- Order via a defined peripheral-vasopressor order set, not an ad hoc nursing order — approval by the attending/consultant (day) or senior (night) is standard practice at sites with a mature protocol.

02 Site Selection and Line Requirements

Table 1. PIV requirements for vasopressor infusion

REQUIREMENT	DETAIL
Location	Forearm/upper arm or antecubital — never hand, wrist, lower extremity
Gauge	≥ 20 gauge, ideally ultrasound-guided placement
Blood return	Brisk, no resistance on flush — confirm before starting and every shift
Line use	Dedicated to the vasopressor only — no other medication in the same line, even if compatible
Backup access	A second line meeting the same criteria is recommended

Exact site/gauge rules vary by institution — the two source SOPs behind this protocol differ slightly (e.g., antecubital-acceptable vs. antecubital-excluded). The adopting site's Section Editor should set one local standard.

03 Set Local Dose and Duration Thresholds

Table 2. Example thresholds from two institutional protocols reviewed for this protocol

SOURCE	AGENT(S)	MAX DOSE	MAX DURATION
Protocol A	Norepinephrine or dopamine (single agent)	Norepinephrine ≤ 12 mcg/min or dopamine ≤ 10 mcg/kg/min	24 hours
Protocol B	Norepinephrine or phenylephrine (single agent)	Norepinephrine ≤ 15 mcg/min or phenylephrine ≤ 75 mcg/min	48 hours

These numbers are **not interchangeable** — they reflect two different institutions' risk tolerance, not a single evidence-based cutoff. This protocol needs one locally-approved threshold before it can be built into the EMR order set.

04 Monitor

- Assess and document the infiltration and phlebitis scale **every 1–2 hours** and PRN.
- Reassess PIV function (site appearance, blood return, flush resistance) at the same interval.
- Notify the charge nurse whenever a vasopressor is infusing peripherally.
- Consider whether an arterial line can be deferred: arterial lines remain preferred for accurate/frequent BP measurement during vasopressor titration, but deferral can be considered for patients meeting the peripheral protocol, with explicit physician sign-off.

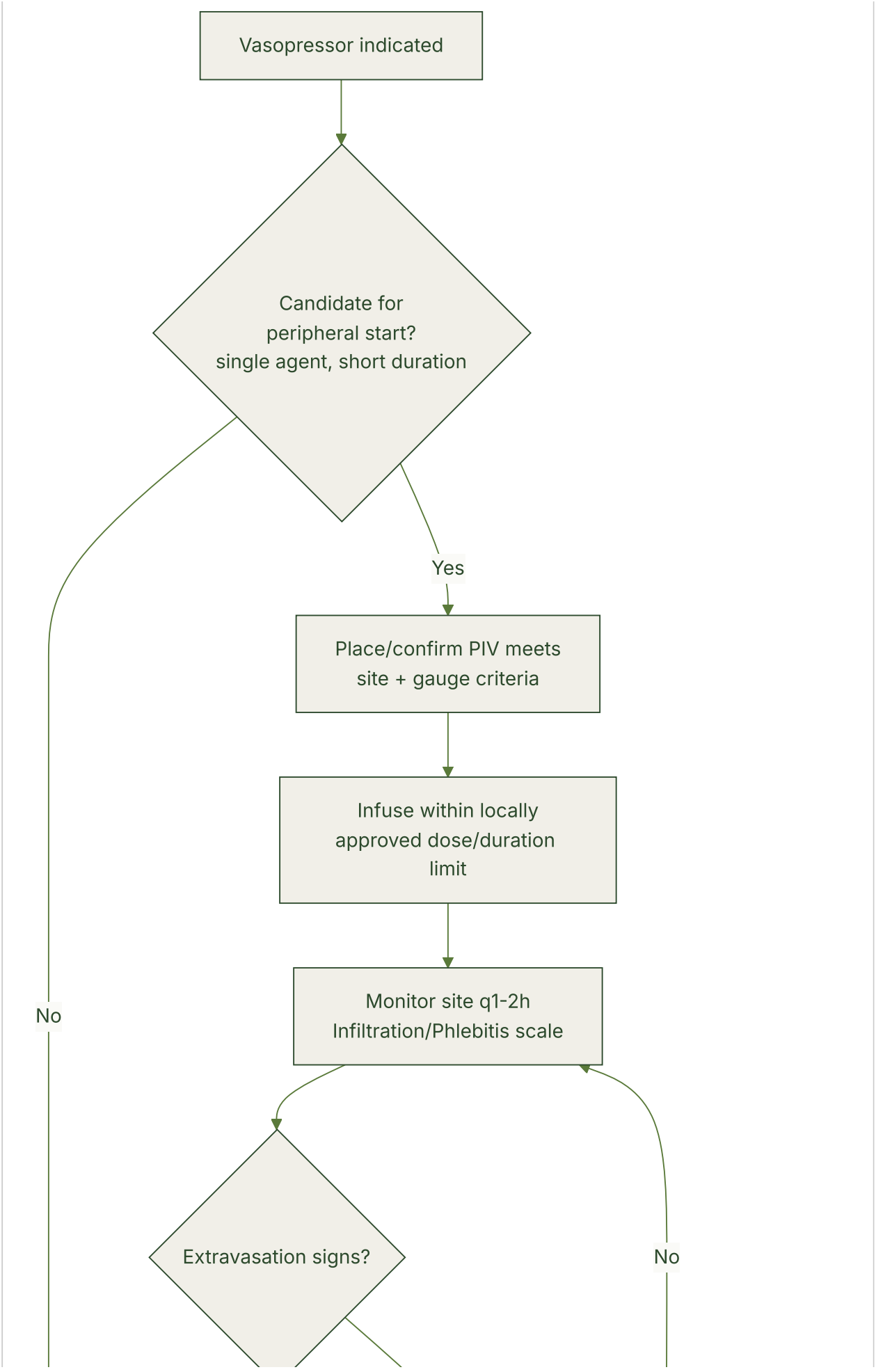
05 Escalate to Central Access When Any of These Apply

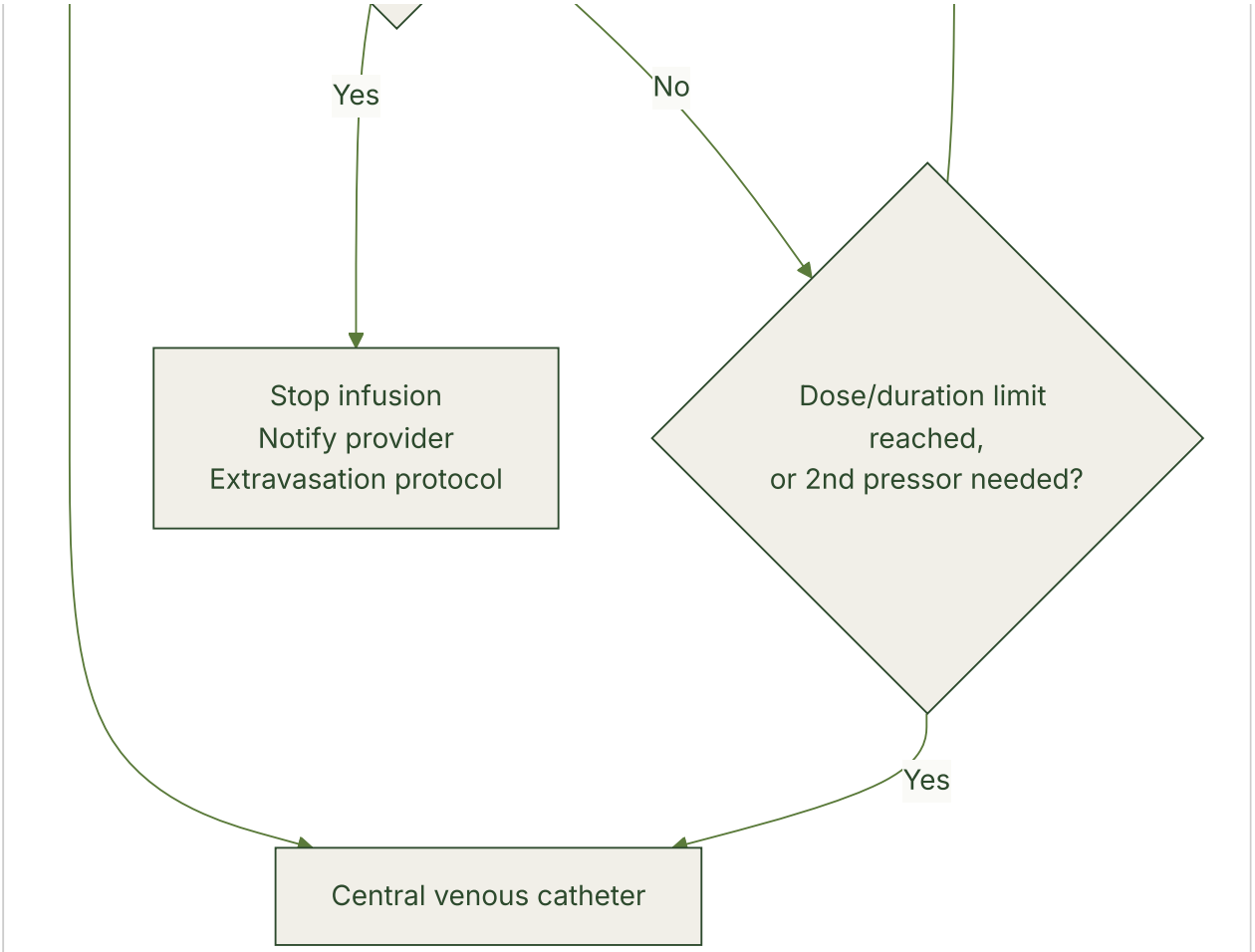
- A second vasopressor is needed.
- The single-agent maximum dose is reached, or the requirement is rising.
- Duration will exceed the locally approved maximum.
- Two compliant peripheral IVs cannot be established or maintained.
- Additional access is needed for fluids/other medications.
- The infusion requires a hypertonic, high/low-pH, or concentrated electrolyte solution not appropriate for peripheral use.
- During acute resuscitation, CVC placement can be deferred up to ~2 hours to avoid delaying reversal of shock; if no vascular access can be established within 5 minutes, consider intraosseous access.

06 Respond Immediately to Extravasation

- Any sign of extravasation (pain, swelling, blanching, cord formation) → **stop the infusion, notify the provider immediately**, and follow the local extravasation/infiltration management protocol.
- Stock the rescue agents needed for a fast response **before** go-live — phentolamine and nitroglycerin paste were both cited as unit stock items in the source protocols reviewed for this protocol.
- Complete an adverse-event report for any site or insertion complication, peripheral or central.

Algorithm


Vasopressor indicated
Candidate for peripheral start? single agent, short duration
Yes
No
Place/confirm PIV meets site + gauge criteria
Infuse within locally approved dose/duration limit
Monitor site q1-2h Infiltration/Phlebitis scale
Extravasation signs?
No



EMR Order Set

PHYSICIAN ORDERS

- Peripheral vasopressor order set entry, naming the approving consultant/senior, with the agent and locally-approved max dose built in as order limits (not free text).
- Arterial-line-deferral order, separate and explicit, when applicable.

NURSING ORDERS

- Vein assessment scale documentation at insertion.
- Infiltration/Phlebitis scale documentation, structured field, every 1–2 hours and PRN.
- Task reminder every 12 hours for consultant/senior re-review of continued peripheral use (auto-generated, not memory-dependent).
- Extravasation protocol activation order, one click from the vasopressor MAR entry.

PHARMACY ORDERS

- Standard-concentration verification for peripheral-appropriate dosing.
- Dose-limit alert if ordered/titrated dose approaches or exceeds the local peripheral maximum.

Build notes — the dose ceiling and duration ceiling should hard-stop or hard-alert in the pump/MAR integration, not rely on nursing recognition; the 12-hour (or locally chosen) re-review task should be genuinely recurring, not a one-time checkbox.

Adoption Notes

- This protocol cannot go live without a **local P&T/nursing/pharmacy decision** on the exact agent list, dose ceiling, and duration ceiling (Step 3) — that decision, not the clinical concept, is the actual rollout blocker.
- Confirm phentolamine and nitroglycerin paste are stocked on the unit before go-live.
- Champion: pairs well with a vascular access/PIVAT nursing champion plus a pharmacy co-sign, given the dosing and monitoring load sits mostly with nursing and pharmacy.

- Stage rollout: pilot with norepinephrine only before adding a second agent to the approved list.

Success Metrics & Monitoring

CVC-days avoided (or CVC placement rate before/after protocol implementation, mirroring the Yerke et al. study design), extravasation rate and severity, rate of protocol-compliant site/gauge documentation, and time from vasopressor decision to infusion start. Track via nursing flowsheet data and adverse-event reporting; review monthly during rollout.

Suggested Reading

1 Yerke JR, Mireles-Cabodevila E, Chen AY, et al. Peripheral Administration of Norepinephrine: A Prospective Observational Study. *Chest*. 2024;165(2):348–355. doi:10.1016/j.chest.2023.08.019. The largest prospective implementation study to date (635 patients); over half avoided CVC placement, extravasation rate 5.5% with no case requiring surgical intervention — the primary evidence this protocol is built on.

2 Munroe ES. A Case for the Evidence-Based Use of Peripheral Vasopressors. *Chest*. 2024;165(2):238–239. Editorial accompanying Yerke et al. above; argues norepinephrine should remain first-line regardless of route, and flags PIV-monitoring frequency as still unstandardized — reflected in this protocol's Step 4.

3 Cardenas-Garcia J, Schaub KF, Belchikov YG, Narasimhan M, Koenig SJ, Mayo PH. Safety of peripheral intravenous administration of vasoactive medication. *J Hosp Med*. 2015. doi:10.1002/jhm.2394. One of the two large prospective studies establishing peripheral vasopressor safety with 2-hourly PIV monitoring.

4 Parienti JJ, Mongardon N, Mégarbane B, et al. Intravascular complications of central venous catheterization by insertion site. *N Engl J Med*. 2015;373(13):1220–1229. Quantifies the CVC complication rates (pneumothorax, CRBSI, DVT) that peripheral administration aims to avoid.

5 Prescott HC, Antonelli M, Alhazzani W, et al. Surviving Sepsis Campaign: International Guidelines for Management of Sepsis and Septic Shock 2026. *Crit Care Med*. 2026;54(4):725–812. doi:10.1097/CCM.0000000000007075. Supports peripheral norepinephrine start under a defined safety protocol rather than delaying vasopressors for central access — see the companion [Sepsis and Septic Shock](sepsis-septic-shock.md) protocol.

Revision History

VERSION	DATE	EDITOR	SUMMARY
0.1	2026-07-19	FunctionalHealth editorial team	Initial version grounded in two institutional SOPs and current literature from the local source folder

Disclaimer: This protocol is an educational reference intended to support — not replace — institutional policy, pharmacy and therapeutics review, and individual clinical judgment. Verify current dosing, contraindications, and local formulary/practice constraints before adopting into an EMR or using in patient care.