ICR-MEN-022

Neurocritical / infectious · critical care

Updated 21 Jun 2026

CRITICAL CARE ORDER SET

Meningitis & Meningoencephalitis

A time-critical CNS emergency. Draw blood cultures and start empiric antibiotics — with dexamethasone and acyclovir when indicated — **immediately**; never wait on CT or LP to treat. Risk-stratify the lumbar puncture, cover by age and host (Listeria, Pseudomonas, HSV), manage raised ICP and seizures, and engage ID, Neurology, and Neurosurgery early. Adapt every dose to renal function, weight, and the patient in front of you.

PATIENT	MRN	WEIGHT (KG) / CRCL	GCS / HOST STATUS
ALLERGIES	**FIRST ANTIBIOTIC TIME**	**ORDERING CLINICIAN**	**CODE STATUS**

KEY PRINCIPLE Draw blood cultures, then start **empiric antibiotics ± dexamethasone ± acyclovir immediately** — then arrange CT / LP. **Do not wait** on imaging or LP to begin treatment.

01 ICU admission criteria — admit if ANY

Airway / breathing

- [ ] GCS ≤ 10 or rapidly fluctuating mental status
- [ ] Cannot protect airway, copious secretions, or frequent suctioning

Circulation / sepsis

- [ ] Septic shock / vasopressor need (MAP < 65 mmHg despite fluids)
- [ ] Lactate ≥ 4 mmol/L or rising despite resuscitation

- [ ] Respiratory failure or need for intubation / mechanical ventilation

Neurologic

- [ ] New focal neurologic deficit
- [ ] Recurrent or status seizures
- [ ] Raised ICP / impending herniation (anisocoria, Cushing triad, posturing)
- [ ] Need for continuous neuro monitoring (suspected encephalitis, ICP monitor, EVD)

Other

- [ ] Rapidly progressive illness, meningococcal sepsis, purpura fulminans
- [ ] Significant immunosuppression with suspected CNS infection
- [ ] Need for continuous cardiorespiratory monitoring & q1h neuro checks

02 Immediate stabilization orders

LOCATION & MONITORING

- [ ] Admit to: **Medical ICU / Neuro ICU**; continuous cardiac & SpO_2 monitoring
- [ ] Neuro checks **q1h × 6 h**, then **q2–4h** as stable
- [ ] Strict I/O; Foley if shock / oliguria or accurate hourly output needed

AIRWAY / BREATHING

- [ ] NPO; oxygen titrated to $SpO_2 \geq$ **92%** (higher if pregnant / severe anemia)

INDICATIONS FOR INTUBATION

- [ ] GCS ≤ **8–10**, loss of airway reflexes, or inability to protect airway
- [ ] Refractory / recurrent seizures; signs of herniation / markedly ↑ ICP

CIRCULATION / FLUIDS

- [ ] IV access — 2 large-bore PIVs ± central line
- [ ] Initial bolus for hypotension / sepsis — **30 mL/kg IV crystalloid** (LR or NS), adjust for cardiogenic risk
- [ ] **Norepinephrine** infusion — start **0.02–0.05 µg/kg/min**, titrate to MAP ≥ 65 mmHg

ICP MEASURES — IF SUSPECTED ↑ ICP

- [ ] HOB 30°, neck midline; avoid hypotension, hypoxia, hypercapnia, hyperthermia

- [ ] Goal $PaCO_2$ **35–40 mmHg**; brief hyperventilation to ~30–32 only as a bridge for impending herniation

HYPEROSMOLAR THERAPY — CONSIDER

- [ ] Hypertonic saline 3% **250 mL IV over 10–20 min** (or 2–3 mL/kg)

OR

- [ ] Mannitol **0.25–1 g/kg IV bolus** (if hemodynamically appropriate & kidneys intact)
- [ ] Neurosurgery / neurocritical care consult for ICP monitor / EVD

03 Diagnostics — do NOT delay antibiotics

Baseline labs

- [ ] CBC with differential
- [ ] CMP (or BMP + LFTs); serum glucose
- [ ] Coags — PT/INR, aPTT, fibrinogen
- [ ] Serum lactate (serial per sepsis protocol)
- [ ] CRP and/or procalcitonin; Mg, phosphate
- [ ] Type & screen; pregnancy test (childbearing potential)

Microbiology — blood

- [ ] **Blood cultures × 2 sets** from different sites — before antibiotics if it does not delay therapy

Lumbar puncture — if safe to perform

- [ ] Opening pressure
- [ ] Cell count with differential
- [ ] Protein, glucose (with paired serum glucose)
- [ ] Gram stain & culture
- [ ] CSF bacterial antigen / multiplex PCR panel
- [ ] CSF HSV, VZV PCR; other viral PCRs per panel
- [ ] CSF fungal stain & culture, TB testing, syphilis serology if indicated

Imaging before LP — if ANY of

- [ ] Immunocompromised
- [ ] New-onset seizure
- [ ] Focal neurologic deficit
- [ ] Papilledema (if assessable)
- [ ] Moderately–severely altered mental status
- [ ] CNS mass lesion / prior neurosurgery

ORDER

- [ ] **CT head without contrast STAT** (or emergent MRI if available & feasible)

04 Empiric antibiotics — bacterial meningitis

DOSING Assumes normal renal function & adult weight — adjust accordingly. **Vancomycin backbone:** load `25–30 mg/kg IV` once (ABW), then `15–20 mg/kg IV q8–12h` to trough 15–20 µg/mL.

A **Age 18–50, immunocompetent, community-onset**

- [ ] Vancomycin (backbone)

PLUS

- [ ] **Ceftriaxone `2 g IV q12h`** (alt: cefotaxime `2 g IV q4–6h`)

B **Age > 50 OR Listeria risk** · alcoholism, malignancy, pregnancy, immunosuppression

- [ ] Vancomycin + ceftriaxone 2 g IV q12h (or cefotaxime 2 g IV q4–6h)

PLUS

- [ ] **Ampicillin `2 g IV q4h`** (Listeria coverage)

C **Immunocompromised** · chemo, low-CD4 HIV, transplant, chronic steroids

- [ ] Vancomycin + ampicillin 2 g IV q4h

PLUS ONE OF

- [ ] Cefepime `2 g IV q8h`

OR

- [ ] Meropenem `2 g IV q8h` (extended infusion often preferred)

D **HCA meningitis / ventriculitis / recent neurosurgery / CSF shunt**

- [ ] Vancomycin

PLUS ONE ANTIPSEUDOMONAL β-LACTAM

- [ ] Cefepime `2 g q8h`
- [ ] Ceftazidime `2 g q8h`
- [ ] Meropenem `2 g q8h`

E **Basilar skull fracture**

F **Penetrating head trauma**

- [ ] Vancomycin + ceftriaxone 2 g IV q12h (or cefotaxime 2 g IV q4–6h)
- [ ] Vancomycin + ONE of cefepime / ceftazidime / meropenem **2 g IV q8h**

G **Suspected rickettsial / ehrlichial CNS infection:** add **doxycycline 100 mg IV q12h** to any regimen above.

05 Empiric therapy — meningoencephalitis

When you suspect meningoencephalitis — altered mental status, focal deficits, seizures, temporal-lobe findings, or hemorrhagic CSF.

5A Antiviral — HSV / VZV coverage

- [ ] **Acyclovir 10 mg/kg IV q8h** (IBW if obese), infused over 1 h; up to 10–15 mg/kg q8h in severe disease
- [ ] Duration **14–21 days** — ≈14 d if immunocompetent, 21 d if immunocompromised
- [ ] Renal dosing — extend interval / reduce per CrCl; aggressive IV hydration & monitor creatinine for crystal nephropathy

START NOW Begin acyclovir **immediately** when encephalitis is suspected — do not wait for CSF PCR. Early HSV PCR may be falsely negative; if suspicion persists, continue acyclovir and **repeat CSF PCR in 3–7 days**.

5B Bacterial meningitis coverage

- [ ] Add the **full empiric bacterial regimen** (Section 4) — distinguishing pure encephalitis from bacterial meningitis is difficult at presentation

5C Tick-borne coverage — if indicated

- [ ] Doxycycline **100 mg IV q12h** if exposure / season / geography AND compatible rash or rickettsial / ehrlichial syndrome

06 Corticosteroids

INDICATION Suspected or confirmed **pneumococcal or H. influenzae** meningitis.

- [ ] **Dexamethasone `0.15 mg/kg IV` (typically 10 mg) q6h × 2–4 days**
- [ ] Start **before or with** the first antibiotic dose
- [ ] Discontinue if pathogen is not *S. pneumoniae* or *H. influenzae*

ADD WITH STEROIDS

- [ ] PPI or H2 blocker for GI prophylaxis if high-risk
- [ ] Glucose checks q6h with correctional insulin for steroid hyperglycemia

NOTE For pure HSV encephalitis, routine steroids are not clearly recommended — consider only with subspecialty advice.

07 Symptom control & ICU supportive care

SEIZURE MANAGEMENT — ACTIVE SEIZURE

- [ ] Lorazepam **`0.1 mg/kg IV`** (max 4 mg) q5–10 min PRN × up to 2 doses
- [ ] Then load levetiracetam **`1–3 g IV`** once; maintenance **`1–1.5 g IV/PO q12h`**
- [ ] Continuous EEG if concern for nonconvulsive status; Neurology consult for ongoing AED management

Analgesia & sedation

- [ ] Acetaminophen **`650–1000 mg PO/IV q6h`** PRN (max 3–4 g/day)
- [ ] Opioids IV PRN (fentanyl 25–50 µg q15min; hydromorphone 0.2–0.4 mg q2–4h), titrate carefully
- [ ] If intubated: propofol **`5–50 µg/kg/min`** or dexmedetomidine **`0.2–1.4 µg/kg/h`**

Antipyretics

- [ ] Acetaminophen as above
- [ ] External cooling if refractory hyperthermia, esp. with elevated ICP

Antiemetics — PRN

- [ ] Ondansetron 4 mg IV/PO q6–8h
- [ ] Metoclopramide 10 mg IV q6h, or prochlorperazine 5–10 mg IV/IM q6h

DVT & GI prophylaxis

- [ ] Enoxaparin 40 mg SC daily (or heparin 5000 units SC q8–12h) unless contraindicated; SCDs
- [ ] Pantoprazole 40 mg IV/PO daily or famotidine 20 mg IV/PO BID in high-

risk patients

Electrolytes & fluids

- [ ] Balanced crystalloid maintenance; daily weight; strict I/O; replace Na, K, Mg, phosphate per ICU protocols
- [ ] Investigate hyponatremia for SIADH vs cerebral salt wasting

08 Monitoring, consults & follow-up

MONITORING

- [ ] Neuro checks **q1–4h** (GCS, pupils, focal signs); MAP goal ≥ 65 mmHg (higher if raised ICP)
- [ ] Daily labs — CBC, CMP, magnesium, phosphate; coags as indicated
- [ ] Daily review to narrow antimicrobials based on cultures, PCR & clinical course

CONSULTS

- [ ] **Infectious Disease** — diagnostics, narrowing, duration
- [ ] **Neurology** — seizures, encephalitis, imaging, EEG
- [ ] **Neurosurgery** — hydrocephalus, EVD/ICP monitor, mass lesions
- [ ] **Audiology / rehab** — during recovery (hearing, cognition, function)

POSTEXPOSURE PROPHYLAXIS / PUBLIC HEALTH — IF N. MENINGITIDIS

- [ ] Chemoprophylaxis for close contacts per local protocol (e.g., rifampin, ciprofloxacin, or ceftriaxone)
- [ ] Notify infection control & public health