

CRITICAL CARE ORDER SET

Myxedema coma

ICU management of severe, decompensated hypothyroidism. Treat empirically on clinical suspicion — do not wait for confirmatory thyroid studies. Adapt every dose to your institutional protocol and the patient in front of you.

PATIENT -----	MRN -----	WEIGHT (KG) -----	DATE / TIME -----
ALLERGIES -----	ATTENDING -----	ORDERING CLINICIAN -----	CODE STATUS -----

01 General orders

- ☐ Admit / transfer to **ICU**
- ☐ Diagnosis: **myxedema coma** (severe hypothyroidism) due to presumed [Hashimoto thyroiditis / post-radioiodine / post-thyroidectomy / medication nonadherence / other]

MONITORING

- ☐ Continuous cardiac monitoring
- ☐ Continuous pulse oximetry
- ☐ Noninvasive BP **q5–15 min**; arterial line if hemodynamically unstable
- ☐ Temperature **q1–2 h** (continuous core temp if available)
- ☐ Strict intake & output; hourly urine output
- ☐ Daily weight

NURSING

- ☐ Vital signs per ICU protocol

- ☐ Notify MD / APP for:
 - ☐ SBP < **90 mmHg** or MAP < **65 mmHg**
 - ☐ HR < **40/min** or new arrhythmia
 - ☐ Worsening mental status or decreased responsiveness
 - ☐ Temperature < **34 °C (93.2 °F)** or failure to warm
 - ☐ New or worsening hypoventilation / rising CO₂
- ☐ Maintain head of bed 30–45°
- ☐ Gentle passive rewarming only (blankets, warm room); avoid active core rewarming initially — risk of vasodilation and circulatory collapse

02

Diagnostic workup

INITIAL STAT LABS

- ☐ TSH, free T4 (and total T4 if free T4 unavailable)
- ☐ Total T3 (optional — not required to treat)
- ☐ CBC with differential
- ☐ CMP (electrolytes, BUN, creatinine, glucose, LFTs)
- ☐ Coagulation profile: PT/INR, aPTT
- ☐ ABG or VBG — CO₂ retention, hypoxemia, acidosis
- ☐ Serum lactate if hemodynamically unstable
- ☐ Serum cortisol (baseline) **before steroids** if it will not delay treatment
- ☐ Creatine kinase (rhabdomyolysis risk)
- ☐ Troponin ± BNP if cardiopulmonary symptoms
- ☐ Lipid panel for baseline (not urgent)

IDENTIFY THE PRECIPITANT

- ☐ Blood cultures ×2 if infection suspected
- ☐ Urinalysis and urine culture
- ☐ Chest x-ray (pneumonia, heart failure, effusion)
- ☐ ECG (bradycardia, low voltage, conduction delays, ischemia)

- ☐ CT head if focal deficits or concern for intracranial event
- ☐ Medication review (sedatives, opioids, antipsychotics, amiodarone, lithium, missed levothyroxine)

ENDOCRINOLOGY

- ☐ Endocrinology consult **urgently** for confirmation, dosing guidance, and follow-up plan

03 Airway & respiratory support

PEARL Myxedema coma frequently presents with hypoventilation and CO₂ retention. Have a low threshold for ventilatory support and watch the rising PaCO₂, not just the SpO₂.

- ☐ Supplemental O₂ to maintain SpO₂ **92–96%** (tailor for chronic hypercapnia / COPD)
- ☐ Monitor for hypoventilation (RR, serial ABG/VBG, mental status)

NONINVASIVE & MECHANICAL VENTILATION

- ☐ Consider NIV (BiPAP) for hypercapnic respiratory failure if the patient can protect the airway
- ☐ Indications for intubation:
 - ☐ Depressed mental status / inability to protect airway
 - ☐ Refractory hypoxemia
 - ☐ Hypercapnia with acidosis, inadequate response to NIV or not a candidate
- ☐ After intubation: lung-protective ventilation per ICU protocol; **avoid excessive sedation** — heightened sensitivity in hypothyroidism

04 Hemodynamic & volume management

- ☐ Assess volume status (clinical exam + POCUS / echo as available)
- ☐ IV access: two large-bore peripheral IVs ± central venous catheter if unstable

FLUIDS

- ☐ Isotonic crystalloid for hypotension or suspected hypovolemia:
 - ☐ **250–500 mL** boluses with frequent reassessment (BP, JVP, lungs, echo)

- ☐ Avoid fluid overload in known cardiomyopathy or heart failure

VASOPRESSORS

- ☐ Norepinephrine infusion per ICU protocol if hypotension persists despite cautious fluids — target MAP $\geq$ 65 mmHg
- ☐ Vasopressin as adjunct for catecholamine-resistant hypotension

CAUTION Hypotension in myxedema is often refractory to pressors until thyroid hormone and glucocorticoids are on board. Treat the endocrine cause in parallel — pressors alone will disappoint.

05 Glucocorticoids — empiric adrenal support

SEQUENCE Give glucocorticoids **before or together with** thyroid hormone. Treat presumptive adrenal insufficiency until excluded — thyroid replacement alone can precipitate adrenal crisis.

- ☐ Draw baseline serum cortisol if it will not delay treatment
- ☐ Hydrocortisone **100 mg IV bolus STAT**
- ☐ Then hydrocortisone **50–100 mg IV q6–8 h** (e.g., 50 mg q6h or 100 mg q8h)

REASSESSMENT

- ☐ Reevaluate need for steroids once adrenal insufficiency is excluded and the patient stabilizes
- ☐ Plan gradual taper in coordination with endocrinology

06 Thyroid hormone replacement

CAUTION Dosing balances urgency against cardiac risk — use the lower end in the elderly, low body weight, or CAD / heart failure. Confirm steroids are given first. Involve endocrinology early.

LEVOTHYROXINE (T4) — IV PREFERRED

- ☐ Loading dose: **200–400 mcg IV once** (lower end if elderly, low weight, or significant CAD / HF)
- ☐ Maintenance: **50–100 mcg IV daily** (some use ~1.2 mcg/kg/day), adjusted by endocrinology

LIOTHYRONINE (T3) – HIGHER RISK, OPTIONAL

- ☐ Reserve for severe, refractory cases, usually with endocrine involvement
- ☐ Liothyronine (T3) IV loading **5–20 mcg**, then **2.5–10 mcg IV q8 h**
- ☐ Use lower doses in older patients or those with CAD / arrhythmia risk

TRANSITION TO ORAL

- ☐ Switch to oral / NG levothyroxine when stable, absorbing enterally, and mental status improved

07 Temperature management

- ☐ Gentle passive rewarming: warm blankets, raise ambient room temperature
- ☐ Warm IV fluids if needed
- ☐ **Avoid aggressive external warming** early (forced warm air to trunk) — risk of vasodilation and circulatory collapse
- ☐ Frequent temperature checks **q1–2 h** until stable

08 Metabolic & glucose management

- ☐ Check serum glucose with CMP and POC as needed

GLUCOSE

- ☐ Hypoglycemia: dextrose **25 g IV (50 mL D50W) STAT**, then D5W / D10W infusion as needed
- ☐ Hyperglycemia: insulin per ICU protocol if persistent glucose > **180 mg/dL**

ELECTROLYTES

- ☐ **Correct hyponatremia cautiously** — usually chronic and dilutional; aim for slow correction
- ☐ Fluid restriction if euvolemic / hypervolemic hyponatremia

- ☐ Hypertonic saline only for severe, symptomatic hyponatremia per ICU protocol
- ☐ Replace potassium, magnesium, and phosphorus per ICU protocols

09 Treat precipitating factors

PEARL Myxedema coma is almost always precipitated by another stressor — infection, cold exposure, sedatives, MI, or stopping levothyroxine. Find and treat it.

INFECTION

- ☐ Empiric broad-spectrum IV antibiotics if clinical suspicion (sepsis, pneumonia, UTI)
- ☐ Adjust regimen for renal function and local resistance patterns
- ☐ De-escalate based on cultures and clinical course

MEDICATIONS & OTHER TRIGGERS

- ☐ Review and hold / reduce sedatives, opioids, benzodiazepines, and other CNS depressants as safely possible
- ☐ Review amiodarone, lithium, or other thyroid-affecting drugs
- ☐ Evaluate for recent surgery, cold exposure, trauma, stroke, MI; nonadherence or interruption of levothyroxine

10 Neurologic & sedation management

- ☐ Frequent neurologic checks (GCS / mental status)
- ☐ **Avoid unnecessary sedatives** — patients are highly sensitive to CNS depressants
- ☐ For procedures or severe agitation: minimal effective doses of short-acting agents (fentanyl, low-dose propofol)
- ☐ CT head / neurology consult if focal deficits, seizures, or atypical course

11 Cardiovascular evaluation & management

- ☐ ECG monitoring: bradycardia, low-voltage QRS, conduction delays, QT prolongation, ischemia

- ☐ Echocardiogram (bedside or formal): LV function, pericardial effusion, valvular disease
- ☐ Pericardial effusion / tamponade suspected: cardiology consult; pericardiocentesis if tamponade physiology
- ☐ **Avoid aggressive β -blockade** — bradycardia is often part of myxedema, not a treatment target

12 Prophylaxis & supportive care

DVT PROPHYLAXIS

- ☐ Enoxaparin 40 mg SC daily
- ☐ Or heparin 5,000 units SC q8–12 h (adjust for renal function / bleeding risk)

STRESS ULCER PROPHYLAXIS

- ☐ PPI (e.g., pantoprazole) or H2 blocker per ICU protocol

NUTRITION

- ☐ NG / OG tube for enteral feeding if unable to take PO
- ☐ Start enteral nutrition when hemodynamic and respiratory status allow
- ☐ Dietitian consult for caloric and protein goals

BOWEL REGIMEN

- ☐ Stool softener $\pm$ gentle laxative — prone to ileus / constipation; avoid aggressive agents

13 Reassessment & follow-up

- ☐ Serial assessment of mental status, temperature, BP / HR, urine output, and ABG/VBG for ventilation and CO₂
- ☐ Repeat free T4 every 24–48 h until improving (TSH lags behind)
- ☐ Adjust thyroid hormone dose per endocrinology and lab / clinical response
- ☐ Review and update goals of care and code status with patient / family when feasible



EDUCATIONAL USE ONLY

Not a substitute for clinical judgement. Adapt all doses, agents, and thresholds to your institutional protocols, formulary, and the individual patient. Involve endocrinology early.

Spreading knowledge

Improving outcomes