Adult ICU Comfort Medication Nomogram

Adult Trauma/SICU and controlled DCD | Version 0.4 | September 6, 2026

Draft for institutional review - not approved for clinical use.

1. Activate the correct pathway

- Establish the comfort-focused decision independently of donation. Confirm goals, consent/surrogate, code status, IV access, allergies, recent opioid/sedative exposure and renal/hepatic function. Continue an appropriate effective baseline; do not reset tolerant patients to naive doses.

- The **rapid pathway** below requires a treating ICU clinician at bedside and continuous nursing observation during active withdrawal or severe rapidly changing distress. Prescriber explicitly selects the drug, entry step and authorized subsequent steps. It is not the default order for every patient made comfort-focused, nor a routine ward/hospice regimen.

- For frailty, low body mass, heightened sensitivity, impaired clearance or uncertain exposure, select the **reduced-dose option** in section 4 or an individualized order. Significant renal failure generally favors fentanyl over morphine; hydromorphone metabolites also warrant caution. Prior tolerance may instead require doses above this starting pathway. [1, 2, 5]

- Choose ONE opioid. Use ONE benzodiazepine only for anxiety, anticipated withdrawal distress or specifically assessed refractory agitation; benzodiazepines are not analgesics. Confirm neuromuscular-blockade recovery. Prepare clinically indicated anticipatory medication before withdrawal; do not wait for avoidable distress. [2, 8]

Assessment and common rescue rule

Treat unacceptable self-reported pain or dyspnea. If self-report is unavailable, proposed triggers are CPOT at least 3, RDOS at least 3, or convincing distress despite a low/uninterpretable score. Aim for patient-acceptable comfort, CPOT at most 2 and RDOS below 3 when interpretable. RASS describes arousal, not pain; specify an individualized sedation goal. Injury, paralysis, weakness and sedation may obscure behavior. These thresholds are local choices. [6, 7]

Reassess before each dose and at the stated interval. If comfortable, give nothing further. With meaningful but incomplete relief, repeat the current dose if still indicated. With little/no relief and no suspected toxicity, advance ONE expressly authorized step. Notify the bedside clinician at the first advancement. Severe nonresponse or an adverse effect warrants immediate review at any step; do not wait to finish a ladder.

2. Rapid opioid rescue - choose one row

Each arrow is a conditional NEXT dose after reassessment, never a loading sequence to administer automatically. These are not equianalgesic conversion rows.

Selected IV opioid	Prescriber-selected rapid pathway	Reassessment / authorization boundary
Morphine	**5 mg**, then **7.5 mg**, then **10 mg** if the common escalation rule is met	Minimum **10 minutes** between rescue doses. Persistent distress after 10 mg requires immediate bedside reassessment and a revised plan before further escalation. [2; local step selection]
Fentanyl	**50 mcg**, then **75 mcg**, then **100 mcg** under the same rule	Minimum **10 minutes** between doses. Persistent distress after 100 mcg requires immediate bedside review. Use mcg, never mg. [1, 4; local adaptation]
Hydromorphone	**0.8 mg**, then **1.2 mg**, then **1.6 mg** under the same rule	Minimum **10 minutes** between doses. Persistent distress after 1.6 mg requires immediate bedside review. Avoid rapid administration. [1, 12; local adaptation]

Stop advancing at relief. The selected effective fixed dose can remain every 10 minutes PRN only while the acute order and direct observation remain active. Higher individualized doses are possible with a new order; the listed boundary is not a pharmacologic maximum. Closely spaced IV doses can overlap before peak effect. The shortened path, entry choices and review boundaries require local validation; published dose ranges do not validate this combined sequence.

3. ICU option: fentanyl + midazolam (Versed)

Explicit alternative regimen, not an additional opioid stacked onto morphine or hydromorphone. Select fentanyl for pain/dyspnea and add midazolam for assessed anxiety, anticipated withdrawal distress or a documented sedation indication. This option may be especially practical for patients already receiving these ICU medications. Midazolam is not mandatory when fentanyl alone achieves the patient's goals. The same pathway is available to donors and non-donors.

A. Patient already receiving fentanyl and/or midazolam

Continue clinically appropriate effective baseline rates and reconcile current rescue orders. The clinician selects fixed rescue doses from recent response and exposure; do not force a tolerant patient onto the low-exposure entries below. If only one drug is needed, do not add the second automatically. Have the selected boluses ready before withdrawal and maintain access during transport.

B. Prescriber-selected rapid pathway for eligible patients

Component	Fentanyl: pain / dyspnea	Midazolam: anxiety / indicated sedation
Rapid IV rescue entry	**50 mcg IV**	**2 mg IV**, only when indicated
Conditional next fixed doses	**75 mcg**, then **100 mcg IV**	**4 mg IV**
Repeat interval and selection	At least **10 minutes**; apply the section 1 rule to the opioid-responsive symptom	At least **10 minutes**; assess anxiety and the individualized sedation goal, not pain alone
Stop / review	Stop advancement at relief. Persistent distress after 100 mcg prompts immediate bedside review before further escalation	Stop advancement at relief. Persistent distress after 4 mg prompts immediate bedside review before further escalation
Infusion only for established sustained need	Exact prescriber-selected **25 or 50 mcg/hour**, or an individualized rate based on exposure; no automatic start	Exact prescriber-selected **2 mg/hour** after response assessment; **1 mg/hour** may be chosen for sensitivity; no automatic start
Routine basal adjustment if expressly authorized	Choose **25% OR 50%** increase, not more often than **every 4 hours**, with an individualized authorized ceiling	For a 2 mg/hour start: **1 mg/hour** increase, not more often than **every 60 minutes**; initial review boundary **4 mg/hour**. See section 5 for the sensitive-start rule

Do not escalate both drugs together merely because one symptom score remains elevated. Match fentanyl changes to pain/dyspnea and midazolam changes to its indication and sedation goal; reassess their combined effects. The table restates the choices in sections 2, 5 and 6, not extra doses to add to those orders. Fentanyl is measured in **mcg** and midazolam in **mg**. Pharmacy-approved IV administration speed, concentrations and pump limits are mandatory.

This pairing and the selected stepped implementation are a local proposal using published component dosing, not a validated head-to-head superior regimen. Fentanyl's rapid-rescue dose steps are informed by Penn and the ACS sample; the midazolam component uses withdrawal guidance and the ACS infusion example. [1, 2, 4]

Reduced-dose, renal/hepatic and toxicity safeguards still apply. Fentanyl can accumulate during prolonged infusion; midazolam clearance and metabolite handling may be impaired in organ failure. Sudden rigidity or unexpected difficulty ventilating after fentanyl requires immediate clinician assessment, not further automatic opioid escalation. Do not use neuromuscular blockade to conceal distress. [9, 13]

4. Reduced-dose option and anticipatory treatment

For a sensitive patient, the prescriber selects ONE fixed lower entry dose rather than activating the higher rapid entry. Proposed lower entries: morphine **2 mg IV**, fentanyl **25 mcg IV**, or hydromorphone **0.2 mg IV**. Reassess at 10 minutes; repeat the same dose once only if still needed without suspected toxicity. If inadequate after these two doses, the bedside prescriber writes the next fixed dose/ladder after reassessing risk. Do not automatically jump to the rapid pathway. Still lower or longer-interval dosing may be necessary. [1, 12; local risk adaptation]

Before planned withdrawal, select an anticipatory dose based on current symptoms, expected distress and prior exposure. A comfortable patient is not required to receive the high-entry rescue dose. Have additional medication available at bedside and establish comfort before reducing support. Do not impose a prolonged low-dose trial on an already tolerant or severely distressed patient; the treating clinician may select a suitable higher entry immediately. [2]

5. Anxiety / agitation - midazolam OR lorazepam

Assess pain, dyspnea, delirium, retention, seizures and other reversible contributors within the goals of care. Sedation is not a substitute for analgesia. Preserve desired interaction where possible. If intentional deeper sedation is required for refractory suffering, document the indication, goals/consent and specialist-supported plan. [8, 12]

Midazolam (Versed): rapid ICU option

Order component	Proposed explicit selection	Reassessment and next action
Rapid rescue / anticipated anxiety	**2 mg IV** when indicated; minimum **10 minutes** between rescue doses	If partial relief, repeat 2 mg only if still needed. If little/no relief without toxicity, the expressly ordered next step is **4 mg IV** at the next 10-minute reassessment. [2; local sequencing]
Effective dose / nonresponse	Continue the effective fixed **2 mg or 4 mg IV every 10 minutes PRN** only during observed acute rescue	Persistent distress after 4 mg requires immediate bedside reassessment. Higher doses or another sedative strategy require a new plan, not automatic progression.
Sensitive patient	Prescriber may instead select **0.5 mg or 1 mg IV**, fixed dose, with reassessment at 10 minutes	One conditional repeat of that dose; then clinician review if still inadequate. Do not activate both the reduced and rapid orders.
Sustained need after rescue assessment	Prescriber may start **2 mg/hour IV**; **1 mg/hour** may be selected for sensitivity, or continue an appropriate established rate	Exact start required. Proposed optional RN titration: **increase by 1 mg/hour no more often than every 60 minutes**, only for recurrent benzodiazepine-responsive symptoms above goal, without toxicity. For a 1 mg/hour sensitive start, use **0.5 mg/hour** increments instead.
Initial infusion authorization	Exact individualized ceiling required; **4 mg/hour** is the proposed initial review boundary for the low-exposure build	If needs exceed the boundary, obtain immediate reassessment and revised authorization. Do not reduce an appropriate established higher rate to fit this example. Rescue boluses address immediate distress.

The 2 mg/hour option is supported by the ACS sample. The infusion increments, hourly interval and review boundary are local build proposals, not a validated terminal-extubation nomogram. Renal/hepatic dysfunction, interacting drugs and prolonged infusions can prolong sedation. Give IV doses slowly using product-specific pharmacy instructions; do not treat "IV push" as permission for an instantaneous injection. [4, 9]

Lorazepam (Ativan): intermittent alternative

For significant assessed anxiety, proposed entry is **1 mg IV**; reassess after **30 minutes** and repeat 1 mg once if still needed without toxicity. If these two doses fail, bedside review may authorize **2 mg IV every 30 minutes PRN** or a switch to midazolam with explicit stop/overlap instructions. The 2 mg step is not automatic. A sensitive patient may start at **0.5 mg IV**, with one conditional repeat after 30 minutes and review if inadequate. [1; local entry selection]

For anticipated extubation anxiety, a separately selected **1-2 mg IV 20-30 minutes before withdrawal** is a published option. Do not combine it with a simultaneous PRN dose. After stabilization, replace acute rescue orders with a prescriber-selected **0.5 mg or 1 mg IV every 4 hours PRN**; scheduled dosing requires established ongoing need and separate authorization. No routine lorazepam infusion is proposed. IV administration must not exceed **2 mg/minute**, with product-specific dilution. [2, 3, 10]

6. Maintenance infusion - do not use a drip increase as rescue

An infusion is optional and must have an established ongoing indication. Review early for recurrent distress despite effective boluses. A proposed review trigger is **two or more rescue doses per hour for two consecutive hours**; severe recurring symptoms warrant earlier review. Do not wait two hours to relieve suffering, and do not convert a brief withdrawal-related cluster of boluses automatically into a high basal rate. [3; local trigger]

Choose the initial basal rate deliberately

Opioid	Proposed prescriber-selected starting framework	Subsequent routine basal review
Morphine	Continue an appropriate existing rate. For ongoing need after effective rapid rescue, a prescriber may select **2.5-5 mg/hour**; choose one exact rate, not the band as an order. A lower rate or bolus-only treatment may be appropriate.	Routine increases no more often than **every 8 hours**. [2, 5]
Fentanyl	Continue an appropriate existing rate, or select **25-50 mcg/hour** after considering rescue response and ongoing need; exact rate required.	Routine increases no more often than **every 4 hours**. [1; local starting band]
Hydromorphone	Continue an appropriate existing rate, or select **0.2-0.5 mg/hour** after considering ongoing need; exact rate required. The higher rescue entry does not force a higher drip.	Routine increases no more often than **every 8 hours**. [1, 5; local starting band]

Default: prescriber-directed basal changes. At reassessment, consider a **25% or 50% increase** for recurrent opioid-responsive symptoms; write ONE selected increment, exact next rate and timing. The 50% option is new in v0.3, not a mandatory escalation. Pharmacy must specify pump-compatible rounding. An optional RN-titration order must preselect the increment, minimum interval above, symptom conditions and individualized upper authorized rate. Missing fields mean no RN basal-titration authority. Do not leave a range such as "25-50%" for unconstrained selection. [5; local authorization design]

The clinical team may issue a new, explicitly justified basal order sooner when necessary after bedside assessment of exposure, response and accumulation; this is not permission for automatic rapid drip escalation. Routine intervals NEVER delay an authorized rescue bolus. New symptoms after multiple increases may reflect toxicity rather than undertreatment.

Tolerant patients and opioid rotation

Use recent effective rescue doses and exposure to select the fixed rescue. For morphine/hydromorphone, **50%-150% of the hourly dose** is a published starting guide, not a universal prescription. Example: morphine 4 mg/hour corresponds to a clinician-selected starting rescue of 2-6 mg; it does not require decreasing a previously effective higher rescue. Calculate prior 24-hour exposure and use pharmacy-verified conversions, including incomplete cross-tolerance when changing opioids. Methadone, buprenorphine and complex rotations require specialist/pharmacy planning. [5]

There is no universal opioid ceiling that fits all tolerant patients. Each order needs an authorized boundary and a prompt route to revised treatment. Reaching a pump/order limit requires clinician escalation, not leaving the patient distressed and not RN dosing beyond authorization.

Toxicity, nonresponse and documentation

Unexpected sedation beyond the prescribed goal, paradoxical agitation, new myoclonus, suspected opioid neurotoxicity or an unexplained medication-related respiratory change requires immediate bedside reassessment. Suspend automatic advancement; adjust/hold/reduce/rotate the implicated drug while maintaining an active plan for suffering. Renal failure/anuria may favor intermittent dosing or a different opioid. Opioid-benzodiazepine effects are additive. Expected dying respirations alone do not establish toxicity, and neither apnea nor hypotension is a treatment target. [5, 9, 10]

During rescue, document symptom/score or its limitations, indication, drug/dose/time, cumulative recent exposure, response and adverse effects. Observe continuously and reassess before dosing, at 10 minutes for the rapid IV pathway or 30 minutes for lorazepam. Once stable after withdrawal, proposed checks are every 15 minutes for the first hour, then at least hourly/PRN; increase frequency with renewed distress. Rewrite the acute plan before transfer to a setting unable to provide this observation.

7. DCD continuity, companion orders and EHR safeguards

Donation does not change the medication target. The treating team controls end-of-life prescribing and administration. Do not select a higher pathway merely because the patient may donate; use the same symptom and toxicity standards as for non-donors. Do not increase or withhold indicated medication to influence a procurement timeline. Continue appropriate infusion/rescue access through transport and if donation cannot proceed. Preserve required death-determination monitoring. Heparin, death determination and NRP remain separate approved policies; this document does not authorize them. [11]

Secretions: proposed glycopyrrolate **0.2 mg IV every 6 hours PRN** troublesome secretions. A separately selected **0.4 mg IV 20-30 minutes before extubation** is an option; count it as the first dose and avoid immediate duplication. Reposition and use gentle oral care; avoid distressing deep suction. Noisy secretions alone do not demonstrate suffering. [2, 3, 4]

Required order-set fields before clinical activation

- Eligibility, goals/code status, treating/covering clinician and contact, withdrawal location and observation capability.

- ONE primary opioid and one anxiety strategy, if indicated; current exposure, organ-function review and allergy/interaction check.

- Assessment tool and comfort goal; individualized RASS goal if sedation is used. Document why the rapid or reduced pathway was selected.

- Fixed initial dose, every authorized next step, indication, minimum repeat interval, stop/advance conditions and review boundary. Do not authorize a range without the selection algorithm.

- Product-specific administration speed, concentration, pump library, line/flush instructions and pharmacy-approved rounding. Use mg or mcg, not a universal mL/hour rate.

- For infusions: exact start, prescriber-only versus expressly enabled RN titration, ONE increment, minimum interval, ceiling and linked fixed rescue order. Leave infusions unchecked unless needed.

- Prevent duplicate opioids, simultaneous midazolam/lorazepam pathways, overlapping anticipatory and PRN doses, and continued acute orders after step-down. No neuromuscular blocker as comfort medication.

- Immediate bedside escalation for severe persistent symptoms, suspected toxicity, unclear orders, loss of IV access or an authorization boundary. Pause further withdrawal steps while distress is addressed.

Build example, not a patient prescription: after eligibility/risk assessment, clinician selects rapid morphine entry 5 mg with the conditional 7.5 mg and 10 mg steps, minimum 10-minute interval and bedside review at nonresponse. Select midazolam only if anxiety/withdrawal distress warrants it. Leave both infusions off unless ongoing need is established. Pharmacy and nursing must complete administration and authorization fields before the build can be used.

What changed from v0.2

Component	Prior proposal	v0.3 review proposal
Rapid morphine entry	2 mg; repeated low-dose steps	Selected 5 mg entry with explicit access to 7.5 mg and 10 mg rescue
Alternative rapid opioid entry	Fentanyl 25 mcg; hydromorphone 0.4 mg	Selected fentanyl 50 mcg; hydromorphone 0.8 mg, with defined next steps
Rapid midazolam / intermittent lorazepam	1 mg / 0.5 mg entries	Selected 2 mg / 1 mg entries; reduced-dose choices retained
Maintenance	Predominantly 25% opioid increments; midazolam 1 mg/hour start	Prescriber can select 25% OR 50% opioid increments; midazolam 2 mg/hour option after need/response assessment
Limits and intent	Assessment-based treatment	Unchanged: stop at relief, individualize for tolerance/clearance, preserve DCD safeguards

These are selectable changes for the relevant clinical context, not instructions to increase an already comfortable patient's medications.

8. Institutional alignment and evidence

Design target: assertive, assessment-driven ICU symptom relief. Use anticipatory treatment, prompt rescue boluses and immediate escalation for persistent suffering. The doses below compare actual published approaches; they do not define a target dose for every patient. Version 0.4 expands the evidence comparison; clinical doses, intervals and safeguards are unchanged from v0.3.

Adult institutional dosing precedents

Program / source status	Published approach	Fit with this draft
Penn Medicine, June 2018 guideline; approved in that document [1]	Opioid-naive morphine starts at 2 mg IV, then 4 and 6 mg, with conditional repeat doses 10 minutes apart. Its later infusion-linked chart includes 8, 10, 12 and 16 mg rescues and higher individualized steps.	Strong precedent for repeated symptom-based IV rescue and continuing an effective baseline. Our selected 5/7.5/10 mg entry is not Penn's initiation sequence. The public PDF does not confirm the current EHR build.
Henry Ford Health System, April 2, 2020 withdrawal education [14]	For persistent respiratory distress: morphine 2, 4, 8, 12, then 16 mg IV, with reassessment after 10 minutes at each step; provider notification if still uncontrolled. Reuse the dose that relieved distress.	An independent institutional precedent for substantial, prompt escalation when needed. Our 10 mg initial review boundary is not a maximum. This is historical COVID-era teaching, not verified current policy; its oxygen and stable-assessment instructions are not adopted.
Vanderbilt, handbook updated August 24, 2026 [3]	Withdrawal guidance starts morphine 2 mg IV every 10 minutes for its distress trigger; after two doses, increase the bolus 50% or 100% according to RDOS severity.	Supports response-based escalation rather than leaving a patient on an ineffective low dose. Our selected entry is higher, and our local assessment thresholds differ. Handbook summary, not an order-set export.
Vanderbilt-contributed sample in ACS TQIP, Appendix 1 [4]	IV morphine 4 mg every 15 minutes OR fentanyl 100 mcg every 15 minutes; midazolam 4 mg every 30 minutes OR lorazepam 1 mg hourly. Optional midazolam infusion 2 mg/hour.	Relevant trauma/withdrawal comparator for opioid and benzodiazepine options. The fentanyl/midazolam combination is available within its choices, but our intervals and conditional steps differ. Count with Vanderbilt, not as a fourth independent institution.

Evidence count: three independent US institutional dosing sources/programs above, plus professional guidance below. Their agreement supports the approach and component doses, not proof that our entire combined ladder has been adopted or validated elsewhere. A national aggressiveness quartile is not established by this sample.

Dose-by-dose comparison for the proposed ICU pathway

Comparison only: source doses here are not additional authorized orders.

Our selected option	Closest published dose precedent	What remains a local adaptation
Morphine 5/7.5/10 mg IV, at least 10 minutes apart	PCNOW 34 gives a post-extubation rescue band of 5-10 mg IV every 10 minutes. Penn and Henry Ford also publish higher rescue steps when symptoms persist. [1, 2, 14]	The 7.5 mg intermediate step, higher entry selection and review boundary. Not an exact hospital ladder.
Fentanyl 50/75/100 mcg IV, at least 10 minutes apart	Penn includes these doses in its infusion-associated rescue chart; ACS includes 100 mcg every 15 minutes. [1, 4]	Penn starts naive patients lower and includes a 62 mcg intermediate step. Our shortened sequence is not Penn's full algorithm; ACS uses a longer repeat interval.
Hydromorphone 0.8/1.2/1.6 mg IV, at least 10 minutes apart	Penn includes these amounts across initiation and infusion-linked rescue, with 10-minute bolus intervals. [1]	Starting at 0.8 mg and compressing the stages. Penn's naive entry is 0.4 mg; the 1.6 mg step occurs in its infusion-linked chart.
Midazolam 2 or 4 mg IV rescue; selected 2 mg/hour infusion	PCNOW 34 gives 2-4 mg IV every 10 minutes after withdrawal; ACS provides 4 mg every 30 minutes and 2 mg/hour infusion. [2, 4]	Our conditional step rule, hourly infusion increments and initial 4 mg/hour review boundary. Neither source validates the whole fentanyl-plus-midazolam pathway.
Lorazepam 1 mg IV, one repeat at 30 minutes; 2 mg only after review	Penn uses 30-minute rescue intervals but starts at 0.5 mg and has staged escalation. PCNOW describes 1-2 mg IV before anticipated extubation anxiety. [1, 2]	Our 1 mg entry and accelerated clinician-reviewed escalation. Pre-extubation and post-withdrawal repeat orders are different contexts, not interchangeable evidence.

Institutional support for rescue-first infusion management

Cleveland Clinic's 2020 ICU withdrawal guidance supports individualized opioid/sedative continuation and treatment of distress; it is a workflow comparator, not support for these exact doses. Kaiser Permanente Southern California's 2019 implementation poster describes shifting from drip doubling toward bolus treatment and graded basal changes, with eight-hour infusion reassessment. These are additional institutional process precedents, not extra votes for higher starting doses. [8, 15]

What protects against undertreatment

Have medication ready before withdrawal; continue an appropriate effective baseline; reassess promptly; use the effective rescue dose again when needed; and obtain immediate bedside revision when an order boundary is inadequate. Do not restart tolerant patients at naive doses or wait for a basal infusion change to relieve acute suffering. Stop escalation at the patient's comfort goal. [1, 2, 5, 14]

Higher medication totals alone do not establish better comfort. A five-site withdrawal trial enrolled 168 patients (120 usual care, 48 algorithm) and found less respiratory distress in the algorithm arm despite more opioid/benzodiazepine use in usual care. The trial stopped early during COVID-19 and tested a broader withdrawal strategy, not this nomogram. A separate two-center order-set report identified discomfort from rapid infusion titration and emphasized pharmacologic redesign. [16, 17]

Approval and evaluation

Before activation, ICU/palliative leadership, Pharmacy/P&T and nursing must approve dose selection, intervals, administration instructions, monitoring, escalation authority and pump limits; DCD governance must confirm independent, uninterrupted comfort care. Confirm current comparator policies directly if the institution requires formal peer-policy attestation. Audit time to comfort, persistent distress, rescue delays, toxicity and transport interruptions, not medication totals or time to death.

References

Sources accessed September 6, 2026. Primary public institutional guidance and professional publications are linked below; dates refer to the visible documents, not verified current institutional EHR builds. The local synthesis, branching rules and approval requirements are distinguished from the source examples.

1. Penn Medicine. Comfort Care Guidelines for Providers. June 2018; appendices B-E, PDF pages 8-15. Open source

2. von Gunten CF, Weissman DE. PCNOW Fast Fact 34: Symptom Control for Ventilator Withdrawal in the Dying Patient. February 20, 2025. Open source

3. Trulove V. Vanderbilt Internal Medicine Residency Handbook: Caring for Imminently Dying Patients. Updated August 24, 2026. Open source

4. ACS TQIP. Best Practices Guidelines in Palliative Care. Appendix 1, sample end-of-life orders attributed to Vanderbilt. Open source

5. Weinstein E, Arnold RM, Weissman DE. PCNOW Fast Fact 54: Opioid Infusions in the Imminently Dying Patient. October 1, 2024. Open source

6. SCCM. PADIS Guidelines. 2018; pain assessment recommendations. Open source

7. Campbell ML, Templin TN. Intensity cut-points for the Respiratory Distress Observation Scale. Palliative Medicine. 2015;29:436-442. Open source

8. Cleveland Clinic. COVID-19: Withdrawal from Life Support in the ICU. May 29, 2020. Historical workflow comparator; COVID-specific device advice is not adopted. Open source

9. DailyMed. Midazolam injection labeling. ICU dosing and administration/interaction precautions; not a terminal-extubation protocol. Open source

10. DailyMed. Lorazepam injection labeling. Administration and additive CNS-depression precautions. Open source

11. ATS/ISHLT/SCCM/AOPO/UNOS. Ethical and Policy Considerations in Organ Donation after Circulatory Determination of Death. 2013;188:103-109. End-of-life principles, not a substitute for current local death-determination policy. Open source

12. Blinderman CD, Billings JA. Comfort Care for Patients Dying in the Hospital. NEJM. 2015;373:2549-2561. Table 2. Open source

13. FDA. Fentanyl Citrate Injection prescribing information, revised December 2025. Distribution/accumulation, muscle rigidity, additive CNS depression and administration precautions; not an end-of-life dosing protocol. Open source

14. Henry Ford Health System. Ensuring Comfort at End of Life: Tier 1 COVID-19 Withdrawal of Mechanical Ventilator at End of Life. April 2, 2020; slides 14-19. Historical institutional education, not verified current orders. Open source

15. Ngo J, et al. Southern California Permanente Medical Group. End of Life Care Order Set Development in an Integrated Health Care System. CAPC poster, 2019; describes 2018 implementation. Process evidence, not a complete dosing protocol. Open source

16. Campbell ML, Yarandi HN. Effectiveness of an Algorithmic Approach to Ventilator Withdrawal at the End of Life: A Stepped Wedge Cluster Randomized Trial. J Palliat Med. 2024;27:185-191. Open source

17. Bender MA, et al. A New Generation of Comfort Care Order Sets: Aligning Protocols with Current Principles. J Palliat Med. 2017;20:922-929. Abstract reviewed; full implementation algorithm not used as a dosing source. Open source

Approval status: all clinical, pharmacy, nursing and DCD approvals pending. Effective date not assigned. Current review copy: https://www.awctrauma.org/comfort-care/nomogram