



Ventilator Withdrawal Guidelines

Preparation

1. **Family meeting.** Review decision to withdraw life-sustaining treatment (LST), and discuss a preferred process.
 - a. If the patient is conscious, what are his or her desires about conducting the procedure?
 - b. Does the family want to be present in the patient's room or in the waiting room, or how should they be notified about the completion of the procedure or death? Do they want to see the patient after the death? Consider special readings, rituals, prayers, or music before, during, and after withdrawal of the ventilator. Advise the family on the possibility, if any, of prolonged survival after withdrawal of ventilatory support.
 - c. Discuss how younger children would be involved and what resources are available to help them: social worker, nursing, Parenting at a Challenging Time (PACT) at 724- 7272, or community hospice programs, etc.
 - d. Consider discussing in advance decisions that will be faced after death, such as tissue, organ, or body donation, autopsy, and funeral arrangements. (If tissue or organ donation can be considered, notify the New England Organ Bank at 800-446-NEOB to discuss it with the family.)
 - e. Establish a time for withdrawal when the family and selected staff can be present. Does the family want others present (e.g., a family priest)?
 - f. Decide on a plan, and then document the meeting and plan in the chart.
 - g. Adjust Limiting Life Sustaining Treatment (LLST) orders in POE.

2. **Clinical team meeting** may include physicians, nurses, social service, chaplaincy, and respiratory therapists:
 - a. Review which Life-Sustaining Treatments (LSTs) are being provided now and which should be withdrawn. Review all orders (life-sustaining and routine treatments) and discontinue whatever is causing the patient discomfort, including routine treatments (e.g., turning), while adding measures to palliate current or anticipated distress.
 - b. What order of LST withdrawal makes most sense? Typically, adequate sedation is achieved before any anticipated discomfort arises, but the following order of withdrawal usually makes sense:
 - i. Blood draws, arterial sticks
 - ii. Intermittent therapies (antibiotics, hemodialysis)
 - iii. Fluid and nutrition
 - iv. Continuous therapies that maintain circulation (pressors, pacers, CVVH, LVAD, IABP)
 - v. Ventilator
 - c. Ventilator withdrawal
 - i. Assure discontinuance of neuromuscular blockade (which would mask distress).
 - ii. Is pre-sedation necessary? Target SAS ≤ 2 (deep sedation).
 - iii. Different methods of discontinuation may be discussed, and may be chosen on the basis of the patient's clinical condition and the family's preferences:
 - **Rapid Reduction** (dialing down the ventilator settings stepwise for FiO₂, PEEP, respiratory rate, and volume or pressure every few minutes, watching for distress) *vs.* **Immediate Cessation of ventilatory support** (immediate discontinuation of mechanical ventilation).

- **Leave in Endotracheal Tube until the patient dies vs. Immediate or Eventual Extubation.** Removal of the endotracheal tube can be associated with severe coughing and messy secretions, but the tube may be a source of distress in conscious patients and prevent talking, while the ventilator may hinder the family from gathering around the bed and touching the patient. Maintaining the airway protects against stridor and difficulty with copious secretions, especially when the patient lacks adequate gag or cough reflex. .
- d. Who will be present during and after the withdrawal procedure in order to assure that plenty of hands are available, but also to address the family's needs (e.g., nurse, social worker, or chaplain)? Consider involving Palliative Care. Who will watch the children? Consider consulting with the Parenting at a Challenging Time (PACT) at 724-7272
 - e. Write orders for management of distressing symptoms and signs, such as agitation, air hunger, and noisy secretions. (Narcotic plus benzodiazepine, and consider anticholinergic agents)

Withdrawal Procedure

1. Create Peaceful Surroundings

- a. Remove unnecessary equipment, creating bedside space for the family.
- b. Provide tissues and comfortable chairs.
- c. Remove mitts and poseys, lower bedrails, and set bed height to facilitate family-patient touching or handholding.
- d. Discontinue monitors and alarms in the room, including but not limited to: oximeters, vital sign monitor, ECG recording, unneeded pumps, and respirator alarms.
- e. Discontinue inappropriate television or radio distractions.

2. Gather Family.

- a. If they stay in the room, review the process of what they might see.
- b. Allow time for any rituals and for saying a final goodbye.
- c. Address particular needs of young children.
- d. Social worker, nurse, or chaplain may stay with the family by the bedside or in the waiting room.
- e. Check family perception of the level of patient comfort, and address appropriately to incorporate their wishes about sedation and analgesia.

3. Determine if premedication is necessary: if the patient is capable of experiencing distress or if distress is likely during the withdrawal procedure, continue current analgesia and sedation regimen, and *premedicate with opioids and benzodiazepines via bolus or infusion* (see below). Even if the patient appears comfortable when undisturbed, *anticipatory dosing* is appropriate if he or she has shown signs of distress during nursing or respiratory care interventions. For example, a comfortable appearing patient may have experienced grimacing or distress with prior suctioning, repositioning, or reduction in ventilatory support, and would be expected to experience distress with withdrawal of ventilatory support.

4. During the withdrawal process, use suctioning as needed, monitor the patient's comfort frequently, and **titrate medications for any signs of distress**, such as tachypnea, labored breathing, accessory muscle use, nasal flaring, tachycardia, hypertension, diaphoresis, grimacing, restlessness, and excess or noisy secretions. The **combination** of an opioid plus benzodiazepine is indicated because narcotics provide relief of dyspnea and pain, while

suppressing cough, whereas benzodiazepines provide sedation, and anxiolysis. Benzodiazepines also offer anticonvulsant effects that may protect from hypoxemia-related seizures. In the ICUs, fentanyl is often the preferred narcotic because of staff familiarity with this agent, while morphine is more likely to lead to toxicity (typically myoclonus) at high doses, especially in the setting of renal failure. However, morphine, not fentanyl, may be continued out of the ICU.

SUGGESTED REGIMENS FOR SEDATION/ANALGESIA/ANXIOLYSIS:

1. Narcotic: increase current regimen or start Fentanyl or Morphine

a. Fentanyl infusion at current rate (assuming patient is comfortable) then bolus with $\frac{1}{4}$ - $\frac{1}{2}$ the hourly dosage and increase infusion rate by 25%.

OR begin with a bolus of 25-100 mcg and start the infusion at 25-100 mcg/hr. For signs of discomfort after the bolus, give an additional bolus of up to 50% of the hourly infusion rate every 3-5 minutes and titrate the infusion q10 minutes in increments of 25-50%.

Note: Fentanyl infusions are not allowed on routine wards. The approximate equianalgesic conversion between intravenous fentanyl and intravenous morphine is 10 mg/hr morphine = 100 mcg/hr fentanyl.

b. Morphine continuous infusion at current rate (assuming patient is comfortable), then bolus with current hourly infusion dose and increase rate by 25%.

OR begin with a 10 mg IV bolus and begin infusion at 5-7 mg/hr. For signs of discomfort, give a bolus equal to the hourly infusion dose and increase the infusion rate by 25-50%. Repeat upward titration every 10 minutes, as needed.

Note: Remember that just increasing the infusion rate for morphine (and hydromorphone [Dilaudid] or methadone) will not lead to a new steady state for a number of hours, so you need to both bolus the patient and increase the infusion rate in order to achieve a new level of analgesia quickly.

2. Sedative: continue current regimen or start a benzodiazepine

a. Lorazepam continuous infusion at current rate (assuming patient is comfortable), then bolus equal to hourly dose and increase rate by 25-50%

OR begin with a bolus of lorazepam 2.5-10 mg IV and repeat boluses every 15 minutes as need or begin a continuous infusion at 2.5-5.0 mg/hr. If an infusion is chosen, titrate upward as often as every 15 minutes for signs of discomfort: give an additional lorazepam bolus equal to the current hourly infusion rate and increase the infusion rate by 25-50%.

b. Midazolam infusion at current rate (assuming patient comfortable at that dose), then bolus over 2 minutes with $\frac{1}{2}$ the hourly rate and increase the infusion rate by 2 mg/hr or 25%

OR begin with a bolus of 2-4 mg IV over 2 minutes and start an infusion at 2-4 mg/hr. For signs of discomfort, give an additional midazolam bolus equal to $\frac{1}{2}$ – 1x the current hourly infusion rate up to q15 minutes and increase infusion rate by 2 mg/hr or 25%.

Note: midazolam infusions are not allowed on routine wards.

(Alternately, titrate equivalent dosages for diazepam or a barbiturate.)

Ventilator Withdrawal

a. If the patient experiences discomfort during any of the following reductions in ventilation, resume higher settings and adjust the medication for comfort prior to further ventilator changes.

- b. Reduce alarm settings (apnea, heat, etc.) to minimal settings or, if possible, turn them off.
- c. Over 0-5 minutes, reduce FiO₂ to room air and PEEP to zero.
- d. You may want to wait a while at this point, expecting the patient to expire, or you can proceed over 0-15 minutes to reduce the respiratory rate and tidal volume or target pressure on the ventilator to 0.
- e. Concerning the airway:
 - i. Extubate patient to room air, wrapping the ET tube (which may be messy) in a towel, or
 - ii. Remove connection to the ventilator, keeping the ETT or tracheostomy in place.
- f. If tracheal secretions are bothersome, an in-line suction catheter can be attached to the ETT without supplemental O₂ or humidity.
- g. Note time of death, if it occurs.

After the Death

- a. Allow family and staff to be with patient.
- b. Allow family to help with postmortem care, if they choose so.
- c. Assess family member's state of grief and ability to travel.
- d. Sedation for family members is generally not appropriate immediately and should usually be reserved for bereaved with serious sleep disorders after 2-3 days. Family members should be referred to their primary care doctor, but hospital rules allow you to prescribe a few pills of a sedative-hypnotic to family members who are not your regular patient.
- e. Assist with decisions, if relevant, about tissue, organ, or body donation, autopsy, rituals after death (calling a funeral home, arranging a wake, funeral service, or memorial service), and notification of relatives and friends.
- f. Place brief note in chart and prepare death certificate (in black ink).
- g. Notify involved staff and allow time for health care team to debrief.

Notes on Discussing Withdrawal with Patient and/or Family

1. Describe the process. Use simple language and allow for questions.
2. **Pause periodically and leave time to listen to family members' concerns and/or reminiscences.**
3. Assure them that achieving comfort is the goal and can be managed.
4. Determine in advance a reasonable level of sedation desired by the patient and family (conscious but calm, light sleep, heavily sedated).
5. Explain that breathing changes will occur, but that breathlessness can be alleviated. If the patient is capable of feeling discomfort, medications will be given to avoid the sensations of breathlessness, pain, or anxiety.

"She'll have many breaths that may look like her last breath but, in the end, we'll know."
6. If a well-sedated or comatose patient shows gasping, twitching or other involuntary movements, reassure the family that such actions do not reflect conscious suffering.
7. Encourage the family to engage in cultural or spiritual practices befitting of the patient's life and traditions.
8. Caution the family that, while death is expected, the timing of it is uncertain.

"After life support machines are withdrawn, we will watch and wait as we continue to focus on comfort while letting nature take its course."

References

- Brody H, Campbell ML, Faber-Langendoen K, Ogle KS. Withdrawing intensive life-sustaining treatment -- recommendations for compassionate clinical management. *N Engl J Med* 1997;336: 652-7
- Campbell ML. Terminal dyspnea and respiratory distress. *Crit Care Clin.* 2004; 20:403-17.
- Curtis JR, Rubenfeld GD, eds. *Managing Death in the Intensive Care Unit: The Transition from Cure to Comfort.* New York, Oxford University Press, 2001.
- Hawryluck LA, Harvey WRC, Lemieux-Charles L, Singer PA. Consensus guidelines on analgesia and sedation in dying intensive care unit patients. *BMC Medical Ethics* 2002;3:3. www.biomedcentral.com/1472-6939/3/3
- O'Mahoney S, McHugh M, Zallman L, Selwyn P. Ventilator withdrawal: procedures and outcomes. Report of a collaboration between a critical care division and a palliative care service. *J Pain Symptom Manage* 2003; 26: 954-961.
- Prendergast TJ, Puntillo KA. Withdrawal of life support: intensive caring at the end of life. *JAMA* 2002;288:2732-2740.
- Truog RD, Cist AFM, Brackett SE, Burns JP, Curley MAQ, Danis M, DeVita MA, Rosenbaum SH, Rothenberg DM, Sprung CL, Webb SA, Wlody GS, Hurford WE. Recommendations for end-of-life care in the intensive care unit: The Ethics Committee of the Society of Critical Care Medicine. *Crit Care Med* 2001;29:2332-2348.
- Treace PD, Engelberg RA, Crowley L, Chan JD, Rubenfeld GD, Steinberg KP, Curtis, JR. Evaluation of a standardized order form for the withdrawal of life support in the intensive care unit. *Crit Care Med* 2004; 32:1141-1148.
- Way J, Back AL, Curtis JR. Withdrawing life support and resolution of conflict with families. *BMJ* 2003; 325:1342-1345. .

REFERENCE TO VENTILATOR WITHDRAWAL POLICIES

- Massachusetts General Hospital Policy and Procedures: *Limitation of Life Sustaining Treatment Policy.*
- Harborview Medical Center-University of Washington Medical Center, Seattle, Washington, "Comfort Care Orders for the Withdrawal of Life Support in the ICU."
- The Johns Hopkins Hospital, Policy: "Procedure for Withdrawal of Life Support in the MICU/MCP."
- Hospice and Palliative Care of Metropolitan Washington Protocol: "Discontinuing of Ventilator Support." 2001.