

PALLIATIVE PEARLS

BY ENCLARA PHARMACIA

Management of Terminal Secretions in the Pediatric Patient November 2018

Patient Case

KC is a 1 year old girl with a primary diagnosis of congenital malformation of the brain who was admitted to hospice 4 months ago. She has no known drug allergies and weighs 22 lbs (10 kg). KC lives at home with her parents and two older siblings.

KC's mother has noticed pauses in her breathing, lasting a few seconds to a minute, and a loud gurgling sound in the back of her throat. The noise is bothersome and uncomfortable for the family. KC's mother recalls the hospice nurse told them to expect this and, now recognizing KC is close to passing, is distraught, and can't recall the nurse's guidance. How could we manage KC's symptoms and her family's distress?

What Causes Terminal Secretions?

Terminal secretions, also known as "death rattle", is a type of noisy breathing from retained secretions that sounds like snoring or rattling during the inspiratory and expiratory phases of respiration. It's estimated to occur in approximately a third of patients during the final days or hours of life when they can no longer clear secretions.¹ Patients with a prolonged dying phase and those with brain and lung cancers are at the highest risk to develop terminal secretions.

How Are Patients and Family Members Impacted By Terminal Secretions?

It is unlikely that patients suffer distress from terminal secretions because they are generally unconscious when it develops.¹ Even in patients who appear comfortable, treatment is often initiated in an attempt to decrease distress for family members. However, not all family caregivers are troubled by secretions depending on whether or not they believe the patient is suffering. The way in which hospice clinicians interpret the symptom influences the perceptions of family members.² Educating caregivers that terminal secretions is a normal part of the dying process and not likely to be causing discomfort to the patient could help to lower family members' distress levels.

What are the Best Interventions for Terminal Secretions?

Studies of the management of terminal secretions have not identified any therapies that are very effective, whether pharmacological or non-pharmacologic. Specifically, current literature does not support the standard use of anticholinergic drugs in the treatment of terminal secretions.^{1,3}

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Non-pharmacological therapy:

- Managing family distress by explaining the nature of dying process, reassuring the family that the child is not suffering⁴
- Repositioning the patient to a side-lying position with the head slightly raised may encourage drainage and decrease pooling of secretions
- Although not supported by research, reducing fluid intake by discontinuing or decreasing parenteral fluids or tube feedings may help to decrease pulmonary edema
- Deep suctioning is not recommended. Terminal secretions are usually inaccessible to suction and the procedure may result in discomfort to the patient.

Pharmacological therapy:

- Despite lack of evidence that they are no better than no treatment or placebo, anticholinergic agents such as atropine, glycopyrrolate, hyoscyamine and scopolamine are commonly used to manage terminal secretions
- Although they may reduce saliva production, anticholinergics are less likely to be effective when secretions are of a pulmonary origin
- Anticholinergics have no effect on secretions that are already present. Therefore, if therapy is indicated, initiate treatment of an agent with a fast onset of action at the first sign of congestion.
- Using more than one anticholinergic medication together provides no additional clinical benefits, but increases the potential for adverse effects

Pharmacological agents:

Hyoscyamine (Levsin®) (PO, SL)

Age - 2-12 years old^{4,5}

- Pediatric dosage - 0.0625-0.125 mg/dose
- Frequency – Every 4 hours
- Maximum dosing - 2-12 years old: 0.75 mg/day, > 12 years old: 1.5 mg/day

Age - < 2 years old⁴

- 2.3 kg: 3 drops/dose every 4 hours; max 18 drops/day
- 3.4 kg: 4 drops/dose every 4 hours; max 24 drops/day
- 5 kg: 5 drops/dose every 4 hours; max 30 drops/day
- 7 kg: 6 drops/dose every 4 hours; max 36 drops/day
- 10 kg: 8 drops/dose every 4 hours; max 48 drops/day
- 15 kg: 10 drops/dose every 4 hours; max 60 drops/day

Comment - Compared to other anticholinergics, hyoscyamine is cost-effective and has a very fast onset of action (3 to 5 minutes)

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Glycopyrrolate (Robinul®) (PO, IV, SC)^{4,5}

- Age – n/a
- Pediatric dosage – PO: 0.04-0.1 mg/kg/dose, IV/SC: 0.004-0.01 mg/kg/dose
- Frequency – 3 to 4 times/day
- Maximum dosing – 1-3 mg/dose PO, 8 mg/day
- Comments – Oral glycopyrrolate has slow, erratic absorption and usually requires higher starting doses for effect compared to parenteral administration. NOTE: The solution for injection is 10 times more expensive in comparison to the 1mg and 2mg oral tablets for the same days' supply. Despite the absorption limitations with oral glycopyrrolate, the tablets still represent a more cost-effective option if therapy is necessary.

Atropine (PO, SL, IV)⁴

- Age – n/a
- Pediatric dosage - 0.01-0.02 mg/kg/dose or 1 drop of 1% ophthalmic solution
NOTE: One study reported a regimen of "0.03mg/kg/dose" appeared to be a safe place to start and was well tolerated.⁵
- Interval for routine dosing – 2 to 6 hours
- Maximum dosing – 0.4 mg/dose
- Comments – Due to its high cost, commercially available atropine eye drops are not recommended. Some pharmacies compound oral atropine suspension that is comparably more cost-effective.

Scopolamine (Transderm Scop®)⁴

- Age - > 12 years
- Pediatric dosage – 1 patch (delivers 1mg over 72 hours)
- Interval for routine dosing – 3 days
- Maximum dosing – 1 patch
- Comments - Scopolamine patches take up to 12 hours for effect and 24 hours to reach a steady state, making them a poor choice in the management of terminal secretions and are not recommended as the first therapeutic choice.³

Assessment

Terminal secretions is a common symptom at the end of life and is a strong predictor of impending death and are unlikely to be a source of distress for patients, but may be for family members. Providing education and reassurance about the cause and management of secretions may help to reduce caregiver distress. Evidence is lacking that any intervention, whether pharmacologic or nonpharmacologic, is better than no treatment in reducing the severity and prevalence of death rattle.

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Recommendations

- Reassure the family that KC is not suffering
- Reposition KC to a side-lying position with the head slightly raised to encourage drainage and decrease pooling of secretions
- Hyoscyamine 0.125mg/ml oral solution was included in the hospice emergency kit delivered to the patient's home shortly after admission: Give 8 drops under the tongue every 4 hours as needed

For additional information on this topic, please review Enclara resources available on the client portal and the below references:

Enclara Resources (Clinical Tools > Resource Documents):

- Information about Secretions for Friends and Family
- Terminal Secretions FAQ
- Atropine and Terminal Secretions FAQ
- Skills Training Secretion Management

References:

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6. Rapoport A. Sublingual Atropine Drops for the Treatment of Pediatric Sialorrhea. *J Pain Symptom Manage* 2010;40:783-788.