

**FAST FACTS AND CONCEPTS #109  
DEATH RATTLE AND ORAL SECRETIONS  
Kathleen Bickel and Robert Arnold MD**

**Background** As consciousness decreases in the dying process, patients lose their ability to swallow and clear oral secretions. Air moves over the secretions, which have pooled in the oropharynx and bronchi, resulting in turbulence and noisy ventilation with each breath. This is often described as ‘gurgling’ or ‘rattling noises.’ While there is no evidence that patients find this ‘death rattle’ disturbing, evidence from bereaved surveys suggests the noises can be disturbing to the patient’s visitors and caregivers who may fear that the patient is choking to death. Similar sounds may occur in patients who are not imminently dying, such as in those with brain injuries or in disorders like Amyotrophic Lateral Sclerosis in which increased production or decreased clearance of secretions occurs. Two sub-types of the death rattle have been proposed, although the significance regarding treatment has not been established: Type 1 = predominantly salivary secretions and Type 2 = predominantly bronchial secretions. Death rattle is a good predictor of near death; one study indicated the median time from onset of death rattle to death was 16 hours.

**Non-Pharmacological Treatments**

- Position the patient on their side or in a semi-prone position to facilitate postural drainage
- A minute or two of Trendelenburg positioning can be used to move fluids up into the oropharynx for easier removal; aspiration risk is increased, however.
- Gentle oropharyngeal suctioning is used although this can be ineffective when fluids are beyond the reach of the catheter. Frequent suctioning is disturbing to both the patient and the visitors.
- Reduction of fluid intake.
- Communication with family and caregivers aimed to address associated fears and interpretations.

**Pharmacological Treatments** While multiple studies have questioned the utility of pharmacologic treatments for death rattle, muscarinic receptor blockers (anti-cholinergic drugs) are the most commonly used class of medication for this symptom. Such agents include scopolamine, hyoscyamine, glycopyrrolate, and atropine. All of these agents can cause varying degrees of blurred vision, sedation, confusion, delirium, restlessness, hallucinations, palpitations, constipation, and urinary retention. The primary difference in these drugs is whether they are tertiary amines which cross the blood-brain barrier (scopolamine, atropine, hyoscyamine) or quaternary amines, which do not (glycopyrrolate). Drugs which cross the blood-brain barrier are apt to cause CNS toxicity (sedation, delirium).

Drug	Trade Name	Route	Starting Dose	Onset
scopolamine (hyoscine) hydrobromide	Transderm Scop	Patch	One 1.5 mg patch	~12 h (24 h to steady state)
hyoscyamine	Levsin	PO, SL	0.125 mg	30 min
glycopyrrolate	Robinul	PO	1 mg	30 min
glycopyrrolate	Robinul	SubQ, IV	0.2 mg	1 min
atropine sulfate	Atropine	SubQ, IV	0.1 mg	1 min
atropine sulfate	multiple	Sublingual	1gtt (1% ophth. soln)	30 min

**Pharmacological pearls**

- Glycopyrrolate has five times the anti-secretory potency compared to atropine but is poorly and erratically absorbed orally. The clinical significance of this is unclear.
- The scopolamine patch releases ~1 mg over 72 hours. It takes 24 hours to reach steady state and for acute symptoms other drugs should be used. The patch should be placed on hairless skin just behind the ear, is changed every 72 hours, and more than one patch can be used at a time.

- Hyoscyamine is available in short-acting, sustained-released, orally dispersible tablet, and oral solution formulations.

#### References

1. Back IN, Jenkins K, Blower A, Beckhelling J. A study comparing hyoscine hydrobromide and glycopyrrolate in the treatment of death rattle. *Palliat Med* .2001; 15:329-336.
2. Ohio Hospice & Palliative Care Organization. *Palliative Care Pocket Consultant*. Dubuque, IA: Kendall Hunt Publishing; 2001.
3. Twycross R, Wilcock A, eds. *Hospice and Palliative Care Formulary USA*. Nottingham, UK: Palliativedrugs.com Ltd; 2006.
4. Wilders H, Menten J. Death rattle: prevalence, prevention and treatment. *J Pain Symptom Manage*. 2002; 23:310-317.
5. Wee B, Hillier R. Interventions for noisy breathing in patients near to death. *Cochrane Database of Systematic Reviews* 2008, Issue 1. Art. No.: CD005177. [DOI: 10.1002/14651858.CD005177.pub2](https://doi.org/10.1002/14651858.CD005177.pub2).
6. Shimizu Y, Miyashita M, et al. Care strategy for death rattle in terminally ill cancer patients and their family members: recommendations from a cross-sectional nationwide survey of bereaved family members' perceptions. *Journal of pain and symptom management* 2014; 48: 2-12.
7. Lokker ME, van Zuylen L, et al. Prevalence, impact, and treatment of death rattle: a systematic review. *Journal of pain and symptom management* 2014;47: 105-122.

**Fast Facts and Concepts** are edited by Sean Marks MD (Medical College of Wisconsin) and associate editor Drew A Rosielle MD (University of Minnesota Medical School), with the generous support of a volunteer peer-review editorial board, and are made available online by the [Palliative Care Network of Wisconsin](#) (PCNOW); the authors of each individual *Fast Fact* are solely responsible for that *Fast Fact's* content. The full set of *Fast Facts* are available at [Palliative Care Network of Wisconsin](#) with contact information, and how to reference *Fast Facts*.

**Copyright:** All *Fast Facts and Concepts* are published under a Creative Commons Attribution-NonCommercial 4.0 International Copyright (<http://creativecommons.org/licenses/by-nc/4.0/>). *Fast Facts* can only be copied and distributed for non-commercial, educational purposes. If you adapt or distribute a *Fast Fact*, let us know!

**Disclaimer:** *Fast Facts and Concepts* provide educational information for health care professionals. This information is not medical advice. *Fast Facts* are not continually updated, and new safety information may emerge after a *Fast Fact* is published. Health care providers should always exercise their own independent clinical judgment and consult other relevant and up-to-date experts and resources. Some *Fast Facts* cite the use of a product in a dosage, for an indication, or in a manner other than that recommended in the product labeling. Accordingly, the official prescribing information should be consulted before any such product is used.