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FAST FACTS AND CONCEPTS #109

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Background As the level of consciousness decreases in the dying process, patients lose their ability to swallow and clear oral secretions. As air moves over the secretions, which have pooled in the oropharynx and bronchi, the resulting turbulence produces noisy ventilation with each breath, described as 'gurgling' or 'rattling noises.' While there is no evidence that patients find this 'death rattle' disturbing, the noises may be disturbing to the patient's visitors and caregivers who may fear that the patient is choking to death. However, similar sounds may occur in patients who are not imminently dying, such as in those with brain injuries or in patients with various disorders leading to increased production or decreased clearance of secretions. 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.

Pharmacological Treatments While there are no evidence-based guidelines, the standard of care is to use muscarinic receptor blockers (anti-cholinergic drugs). These 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 1.5mg patch	~ 12 h (24 h to steady state)
hyoscyamine	Levsin	PO, SL	0.125mg	30min
glycopyrrolate	Robinul	PO	0.2mg	30min
glycopyrrolate	Robinul	SubQ, IV	0.1mg	1min
atropine sulfate	Atropine	SubQ, IV	0.1mg	1min
atropine sulfate	multiple	Sublingual	1gtt (1% opth. soln)	30min

Pharmacological pearls

- Glycopyrrolate has five times the anti-secretory potency compared to atropine but is poorly and erratically absorbed. 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.

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