Dealing with Drooling

Getting rid of excess saliva goes high-tech.

BY AMY PATUREL, M.S. M.P.H.

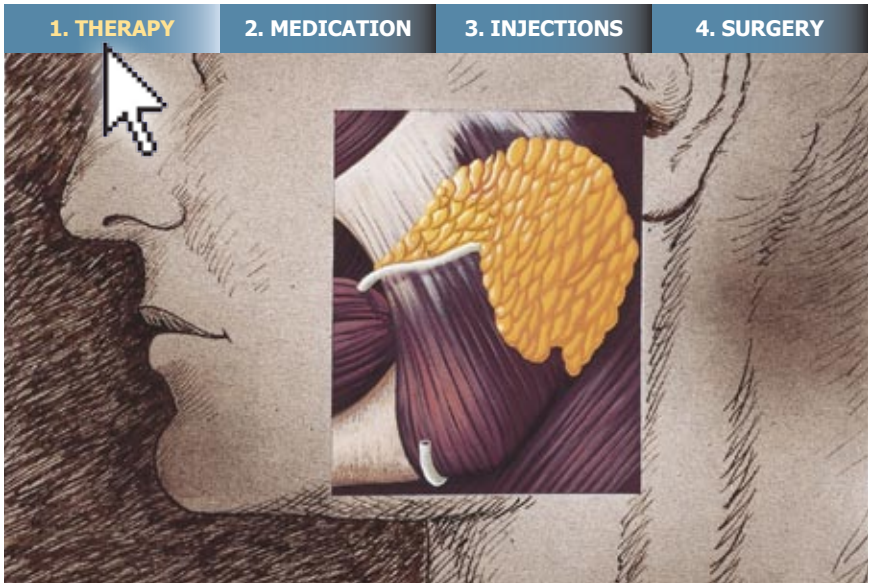
When 61-year-old Deborah Clark first experienced trouble swallowing, she didn't think much of it. But six months later, when she began having symptoms like slurred speech and difficulty projecting her voice, she visited a neurologist. Diagnosed with amyotrophic lateral sclerosis (ALS, also called Lou Gehrig's disease) in February 2008, Clark quickly discovered how integral the muscles in her mouth were to her quality of life. Not only did she have difficulty speaking, but she also experienced excess saliva pooling in her mouth. At its worst, Clark found herself changing clothes up to four times a day because she had drooled down the front of her shirt.

"I was reluctant to be in public or around strangers—especially when a meal was involved," says Clark. "People were always offering me tissues to control the drooling. It was embarrassing."

Drooling, or sialorrhea, can be a major problem for people with neurologic conditions ranging from Parkinson's disease and cerebral palsy to certain types of stroke and ALS. People with these conditions may not have the brain control to coordinate muscle movements in the face and mouth.

"Any condition that affects the muscles and nerves of the bulbar area (the swallowing mechanism) could cause increased drooling," says Steven Bachrach, M.D., co-director of the Cerebral Palsy Program for Alfred I. duPont Hospital for Children in Wilmington, DE. And if you're not swallowing your saliva, it tends to pool and accumulate in the mouth, and then it starts overflowing.

Beyond the obvious social implications of incessant drooling, the overflow of saliva in the mouth can irritate tissues around the lips and even cause aspiration pneumonia, a serious condition where people breathe fluid (or other foreign materials) from the mouth into the lungs. But with recent advances in everything from oral medication to botulinum toxin injections, people have more options than ever to control sialorrhea.



SWALLOWING THERAPY

Speech and swallowing therapy is a great option for people who are mildly impaired and highly motivated to control their drooling. Most neurologists will advise patients to investigate this approach before considering invasive procedures. Through a series of sessions, therapists teach patients a variety of techniques to improve the safety of swallowing and minimize the risks of aspiration.

"There's a lot that a swallowing therapist can do in this area," says Robert Miller, M.D., professor of neurology at Stanford University and director of the Forbes Norris ALS Research Center at the California Pacific Medical Center in San Francisco. "If you tuck in your chin when you're swallowing, for example, you'll open up the airway, making it easier for fluid and food to go down."

Even just becoming more aware of when and how you swallow can be effective. With regular training, people can learn to swallow more efficiently and get rid of excess saliva. Unfortunately, none of these techniques actually dries up the spit. If that's your goal, medications or surgery are your best bets.

MEDICATION

When less invasive methods have failed, the next approach is medication, usually anti-cholinergic medications. This class of drugs is used for everything from seasickness to overactive bladder. But with dry mouth as one of the main side effects, anticholinergics have become a useful tool to control drooling. In fact, studies investigating glycopyrrolate (the most commonly prescribed medication for drooling) consistently find the drug reduces drooling for up to 95 percent of patients who try it.

"One of the biggest challenges was that glycopyrrolate was only available in tablet form, so it was hard to adjust the dose to very small amounts," says Dr. Bachrach. But in January 2011, the Food and Drug Administration approved a liquid form of the drug, which will make it easier to take and easier to dose.

When Clark started taking glycopyrro-

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late, her drooling improved within a matter of days. Initially she took one tablet three times a day, but eventually she needed four tablets daily to experience the same effects. Over time, even four tablets didn't reduce her drooling to an acceptable level.

"Even if the drugs do work initially, receptors on the cells and within the salivary glands change, so patients may end up requiring higher and higher doses to get the same result—and then they get side effects," says Scott Brietzke, M.D., M.P.H., director of pediatric otolaryngology at the Walter Reed Army Medical Center in Washington D.C. While dry mouth is the most common side effect, some people also experience constipation, urinary retention, and cognitive side effects such as confusion and memory impairment.

If the anti-cholinergics stop working—or the side effects are intolerable—some physicians prescribe amitriptyline, an antidepressant that dries up saliva. A bonus: amitriptyline improves sleep, which is often disrupted in patients with ALS, multiple sclerosis, and other neurologic disorders.

INJECTIONS

If meds can't control drooling, botulinum toxin is another option. Using an ultrasound-guided approach, the physician injects the drug into the major salivary glands to paralyze the muscles that normally squeeze out saliva. In one study of 131 patients, published in the medical journal *Archives of Otolaryngology Head and Neck Surgery* in 2010, botulinum toxin injections in the submandibular glands (the two glands located in the lower jaw that produce most of the saliva) reduced drooling and improved quality of life among patients who received injections. Two months after the injections, nearly 50 percent of patients experienced significant improvement, with effects beginning to taper off at the eight-month mark.

Clark started with just two shots into the salivary glands on either side of her face. Within a week, her drooling had dissipated more than it had with glycopyrrolate alone, and the effects lasted for three months. On the heels of this success, Clark's physician gradually increased her dose to a total of six shots (three on each side).

"With six shots, the results were much more dramatic," says Clark. "I have very little drooling and the only side effect is dry mouth, which is easier to deal with than drooling." After the last round of botulinum toxin, Clark discontinued the glycopyrrolate without any noticeable difference.

Studies suggest that combined injections in both the parotid glands (which are located in the cheeks) and submandibular glands are slightly more effective than injections into the submandibular glands alone. And after repeated injections, there have been some reports that the salivary glands actually stop working, resulting in a permanent reduction in drooling. "You can't count on that," says Dr. Bachrach, "but it does happen in some patients."

For other people, though, botulinum toxin is just a trial procedure to determine whether surgery will be effective. "Botulinum toxin deactivates those major glands, so we can see if that helps the patient with either the social problem or aspiration," says Dr. Brietzke. "If there's significant improvement, then we can consider a potentially irreversible procedure, such as tying off the ducts or removing the glands."

SURGERY

Surgical treatment for drooling may be even more effective than injections, without subjecting people to recurrent treatments. Studies show that people who have surgery are generally happy with the results. Unfortunately, there are a variety of approaches and little consensus about which ones work best. The most straightforward procedure involves the submandibular glands: Rerouting the ducts from these glands to the back of the mouth makes it easier to swallow saliva. Alternatively, surgeons can reroute the ducts from the parotid glands or remove the submandibular glands altogether.

"The evidence we have suggests that intra-oral procedures (like tying off the four ducts in the mouth) may not be as successful," says Dr. Brietzke. According to a study he co-authored in *Archives of Otolaryngology Head and Neck Surgery* in 2009, removal of the submandibular glands and parotid duct rerouting appear to have the highest success rates at 87.8 percent while the success rates for tying off the four ducts varied wildly from 31 to 100 percent.

"The biggest downside is that surgery is not reversible," says Dr. Bachrach. "Once you've tied off the ducts, or removed the glands altogether, you can't undo that." So while you can go from drooling to dry, you can't go back. And dry mouth has its own set of complications.

Even so, treating symptoms like drooling still gets short shrift from some health care providers.

"We tend to think that since some of these [neurologic] conditions are incurable, they're also untreatable," says Dr. Miller. "That's a big mistake. We have many treatments—for the breathing issues, the nutritional issues, treatments that slow the progression of disease, and yes, treatments for drooling."

For Clark, that treatment has been invaluable. Today, she no longer carries a napkin with her at all times, she doesn't shy away from social events, even with strangers, and her shirt stays dry throughout the day. "I'm very happy with the results," she says. NN