

Understanding Drooling in Parkinson's Disease

Poor control of saliva is known as **sialorrhea** and is a common non-motor symptom in people with Parkinson's disease (PD), affecting up to 80% of individuals at some stage. This issue may be mild, such as waking with a damp pillow in the morning. In some cases, however, the problem can be severe and cause excessive drooling, which can result in significant embarrassment and social isolation. In addition, saliva can pool in the mouth, causing aspiration (the accidental entry of saliva into the lungs) which could lead to aspiration pneumonia, a serious complication.

Some people with PD have problems controlling saliva because swallowing is less frequent, due to the general slowness of movement that accompanies PD. In addition, a person with PD may have less control over the muscles of the oral cavity and face, leading to a delay in the person's ability to trigger a swallow when necessary.

An additional problem that some people with PD report is saliva that is too thick, making it difficult to manage.

The good news is that there are some effective options for improving drooling issues.

Solutions to Drooling

Non-pharmacological approaches

Chewing gum or sucking on a hard candy may be helpful for certain people to stimulate more frequent swallowing. Speech and swallow therapy with a speech-language pathologist (SLP) trained in neurodegenerative conditions can be helpful, although gains are typically difficult to maintain. Therapy will emphasize:

- Making sure that your neck is in an upright position
- Consciously remembering to swallow before you open your mouth to speak or eat
- Setting alarms or reminders to consciously swallow regularly throughout the day
- Focusing on keeping your lips together
- Keeping the head of the bed raised at night, or lying on your side when you sleep

Certain medications can increase saliva production. Clozapine, which is sometimes prescribed for psychosis in PD, is one of these medications. Be sure to review your medications with your doctor since it is possible

that one of your medications is contributing to the problem of sialorrhea.

For those struggling with thick saliva, non-pharmacological approaches include:

- Staying well hydrated and drinking frequently; carbonated fluids and ice chips can be helpful
- Trying sour or tart foods, as well as soft, moist foods to thin the saliva

Medications

- **Oral medications.** Anti-cholinergic medications such as benztropine, scopolamine, glycopyrrolate, and ipratropium bromide can cause dry mouth and can therefore be useful to control drooling. Unfortunately, because these medications are ingested by mouth and are distributed via the blood stream, they can also cause effects in other parts of the body such as urinary retention, constipation, and blurry vision. Recent guidelines recommend cautious use of anti-cholinergic in older adults with PD due to their risk of cognitive side effects as well. Therefore, these medications need to be used with caution. Scopolamine and benztropine can also cross the blood-brain barrier and cause side effects such as drowsiness and confusion. Some physicians prescribe atropine sulfate ophthalmic drops (another anti-cholinergic medication) to be placed under the tongue to control drooling. This method is meant to deliver the anti-cholinergic effects more locally, thereby preventing anti-cholinergic side effects in other parts of the body. However, this too must be used with caution as effects can still be widespread, and much care needs to be taken to deliver only 1-2 drops under the tongue at a time.
- **Botulinum toxin injections** into the salivary glands can decrease production of saliva and thereby decrease drooling. Botulinum toxin injections are generally well-tolerated, with effects typically lasting 2-4 months. They have become a common and effective method of controlling saliva with minimal side effects when administered correctly.

There are three sets of salivary glands in the human body: the parotid glands (in the cheek), the sublingual glands (under the tongue), and the submandibular glands (under the jaw). Parotid injections are the most straightforward to perform and are typically

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administered by a movement disorder physician during a routine office visit. If these injections are not sufficient to control the drooling, however, the next step is to try botulinum toxin injections of the sublingual and/or submandibular salivary glands. This is a more specialized procedure and may require a visit to an ear, nose, and throat (ENT) specialist.

It is important to note that botulinum toxin not only decreases saliva production but can also weaken muscles, including the muscles needed for swallowing. Botulinum toxin injections are therefore not a treatment for swallow dysfunction and can in fact cause swallow dysfunction. The parotid gland in the cheek is far enough away from the swallowing muscles that impairment of swallowing is typically not a side effect, although it can be in rare cases. Sublingual and submandibular salivary glands are in closer proximity to the swallowing muscles, so injections of these salivary glands have a higher risk of causing swallowing dysfunction. Therefore, only someone trained specifically in these injections should perform them.

Types of botulinum toxin on the market

There are seven different types of botulinum toxin. Two of them, called “A” and “B,” are available for medical use; the others are not. There are five formulations of botulinum toxin A: AbobotulinumtoxinA, IncobotulinumtoxinA, OnabotulinumtoxinA, PrabotulinumtoxinA-xvfs, and DaxibotulinumtoxinA-ianm; and one formulation of botulinum toxin B: RimabotulinumtoxinB. Each of these products differs slightly in their purity and dosing. Two of these preparations, IncobotulinumtoxinA and RimabotulinumtoxinB, are FDA-approved specifically for chronic sialorrhea. DaxibotulinumtoxinA-ianm is a newer formulation and is not yet FDA-approved for drooling but is undergoing continued study. The others have been tested less rigorously for drooling, but some practitioners use these formulations off-label for drooling as well. Below is a table that outlines the botulinum toxin products that are commercially available.

Toxin	Brand name	FDA approved for sialorrhea?
Botulinum toxin A		
AbotulinumtoxinA	Dysport®	No
DaxibotulinumtoxinA-ianm	Daxxify®	No
IncobotulinumtoxinA	Xeomin®	Yes
OnabotulinumtoxinA	Botox®	No
PrabotulinumtoxinA-xvfs	Jeaveau®	No
Botulinum toxin B		
RimabotulinumtoxinB	Myobloc®	Yes

*Availability and approval status may evolve. Providers should check current prescribing information and FDA updates.

If drooling is a problem for you, be sure to talk with your doctor about it, as there may very well be a solution to improve the situation.

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