

## Gastrointestinal and Urinary Dysfunction in PD

The clinical features of Parkinson's disease (PD) are reminiscent of bamboo. At first glance PD appears to be a very confined condition, characterized by problems with movement such as tremor, muscle stiffness and slowness in movement. Upon further inspection, it turns out that just as the bamboo plant sends out rootstalks that appear and grow in unexpected and unwanted locations, we find that Parkinson's disease is not limited to impairment of movement and that it too has "rootstalks" in the form of numerous clinical features that have little or nothing to do with movement.

Among these "non-motor" features of PD are disturbances within the autonomic nervous system — that is, the part of the nervous system that controls "automatic" bodily functions such as heart rate, blood pressure, sweating, sexual function and both gastrointestinal and urinary function. This article will focus on these latter two problems, which are often among the most serious and complex issues that people with PD face.

### The Mouth: Dental problems and saliva

Within the human body the gastrointestinal system stretches from "stem to stern," beginning with the mouth and terminating at the anus. People with Parkinson's can experience problems with gastrointestinal function at both of these ends and virtually everywhere in between.

Let's start at the top. There is a general perception that people with Parkinson's are prone to dental problems because of difficulty brushing their teeth, coupled with excess saliva and perhaps a fondness for sweets. However, studies have generally not confirmed this. In fact, in several studies from Japan, individuals with PD had fewer decayed, missing or filled teeth than comparably aged persons who do not have Parkinson's disease. On the other hand, people with Parkinson's may confront other oral abnormalities of a difficult nature, such as a burning sensation within the mouth (observed in 24 percent of PD patients in one study). Bruxism, or grinding of the teeth, may also occur and this can lead to dental damage and jaw dysfunction.

Excess saliva in the mouth, which often causes drooling, has been recognized as a feature of PD since James Parkinson first described the syndrome in 1817. Studies have shown that 70 to 78 percent of people with Parkinson's experience this problem. While not dangerous or life-threatening, it can sometimes be so socially embarrassing that a person becomes reluctant to go out in public.

This condition is not due to excess production. On the contrary, most people with Parkinson's actually produce *less* saliva than normal. The problem is that PD reduces the frequency of automatic swallowing, and this in turn allows saliva to accumulate within the mouth and then escape when the mouth is opened. Drooling can be controlled temporarily by chewing gum or sucking on hard candy, which triggers the

action of swallowing. This can help in social situations, but is not feasible for more constant saliva control.

Another recourse can be to take medications to reduce saliva formation, but these can make saliva thicker and stringier. These drugs (one is trihexyphenidyl) may also aggravate bowel and bladder problems and can even impair memory. Using atropine eye drops (one drop on or under the tongue once or twice daily) may avoid these adverse effects and still be effective. And in severe cases, injections of botulinum toxin into the salivary glands have been found to reduce saliva formation and drooling.

### Dysphagia

Difficulty swallowing, or dysphagia, is a very common problem in Parkinson's. At least 50 percent (some studies even suggest over 80 percent) of people with PD experience difficulty in swallowing, and an even greater percentage show abnormalities on x-ray tests of swallowing.

Difficulty swallowing is usually due to the lack of coordination among the many muscles in the mouth and throat that must work together in perfect precision to produce normal swallowing. When food gets stuck in the mouth, the person may have to try several times to complete a swallow. The muscles in the back of the throat — and in the esophagus — may also lose coordination, and individuals who have difficulty swallowing are at increased risk for food or liquid to get into the windpipe. From there, it can get into the lungs (called aspiration), which can result in pneumonia.

Although treatment of dysphagia can be difficult, speech/swallowing therapists can instruct patients on swallowing techniques and on designing changes in food consistency that reduce the risk of aspiration. Some improvement in coordination of the muscles used in swallowing may be achieved through adjustments in PD medications. Only very rarely is it necessary to place a feeding tube.

### Stomach problems

Impaired ability to empty the contents of the stomach, called gastroparesis, is another potential gastrointestinal complication of PD. This may produce a bloated sensation and cause people to feel full even though they have eaten very little. Sometimes nausea may develop.

Failure of the stomach to empty in a timely fashion may also impair or delay the effectiveness of PD medications, especially levodopa, since levodopa is absorbed from the small intestine and cannot get to its destination if it is trapped in the stomach.

Treatment of gastroparesis in Parkinson's has not been extensively studied. Domperidone is an effective medication, but unfortunately it is not available in the US. Treatment routes that bypass the stomach, such as transdermal drug

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delivery by skin patch, may become available in the near future. Another potential treatment under investigation involves a form of levodopa designed to be delivered directly into the small intestine via a feeding tube.

### **Bowel dysfunction**

The most widely recognized gastrointestinal problem in Parkinson's disease is impairment of bowel function. This can be one of two kinds. The better known is decreased frequency of bowel movements, or constipation. The current definition of constipation is fewer than three movements per week. Estimates of the number of people with PD who experience this difficulty range from 20 to 77 percent. Decreased bowel movement frequency is due to sluggish travel of material through the colon, and as many as 80 percent of people with Parkinson's may experience this slow rate of colon transit.

Treatment of slow-transit constipation in PD involves measures designed to increase colonic motility. The first step is to increase both fluid and fiber intake. Current recommendations suggest that daily fiber intake should be in the range of 20–35 grams, but the average American only consumes around 14 grams. Fiber intake can be increased through dietary measures or fiber supplements.

If increasing fiber and fluid intake is not adequately effective, the next step can be to add a stool softener. If the problem still persists, the doctor may suggest initiation of an agent that draws fluid into the colon, such as lactulose. If that does not help with the problem, daily doses of a colon-cleansing agent such as MiraLAX® may be employed. And if all else fails, it may be necessary to resort to enemas — but only under the supervision of a physician. We need to find new treatments to increase the speed of colon transit, and studies investigating some potential agents are underway.

The other, and less well-recognized, type of impaired bowel function in Parkinson's disease is difficulty with the act of defecation itself. Typically, this problem manifests itself in undue straining and sometimes incomplete emptying. In research studies, it is shown that this problem is actually more common than decreased bowel movement frequency. Difficulty with the act of defecation is due to failure of the rectal sphincter muscles to relax in a coordinated fashion when the bowel movement is being attempted — perhaps due to spasm, or dystonia, affecting these muscles.

The medications described earlier to hasten colon transit are of no value in addressing this problem, and could conceivably even worsen matters by rushing more fecal material to a rectal “door” that does not want to open. No proven treatment for this problem exists, although keeping stool soft seems logical. There have been some suggestions that apomorphine injections just prior to attempting a bowel movement may be helpful, but formal studies of this approach have not been undertaken. Botulinum toxin injections into the sphincter muscles have also been successfully employed in small numbers of patients.

### **Bladder and urinary difficulties**

Bladder or urinary difficulties are also common in PD.

Older research studies indicated the presence of impaired urinary function in slightly over 70 percent of PD patients, although recent studies suggest a more modest frequency of 27 to 39 percent. Despite the frequency of urinary dysfunction, actual urinary incontinence is relatively uncommon. Troublesome incontinence develops in only about 15 percent of individuals.

Unlike bowel dysfunction, which may precede (sometimes by years) the development of motor features in people with PD, urinary dysfunction typically does not become evident until the later stages of the disease. The primary function of the bladder is twofold — to store urine as it is formed and then to empty the urine when it is convenient and socially acceptable to do so. With PD, problems can emerge in both areas.

The most common urinary symptoms experienced by people with Parkinson's are first, the need to urinate extremely frequently, and second, difficulty in delaying urination once the need is perceived, creating a sense of urinary urgency. These symptoms usually indicate an irritable or overactive bladder that is signaling the brain that it is full and needs to empty when, in fact, it really is not. In addition to urinary frequency and urgency during the daytime, individuals with this problem also may have to get up multiple times during the night to urinate.

Medications that work to block or reduce bladder overactivity can be useful in treating this form of bladder dysfunction. A variety of medications are available for this purpose, including older medicines such as oxybutynin and tolterodine, and newer medications such as solifenacin and darifenacin.

Impairment of bladder emptying is a less frequent but still troublesome feature of urinary dysfunction in Parkinson's. This difficulty is produced by delay or difficulty in relaxation of the urethral sphincter muscles, which is necessary to allow the bladder to empty. This can result in hesitancy in initiating urination, difficulty in generating a stream and incomplete emptying of the bladder. Dystonia of the urethral sphincter has also been described.

The medications listed above are not helpful for this type of bladder dysfunction and may actually aggravate the difficulty. Medications such as bethanechol may be helpful but intermittent self-catheterization is sometimes necessary. Before initiating these, a doctor must make sure that some unrelated process, such as an enlarged prostate, is not responsible for the problem.

### **The Bottom line**

Both gastrointestinal and urinary problems are frequent features of PD. Awareness of their existence and recognition of their presence are the first necessary steps to adequate management. People with Parkinson's should not hesitate to bring these problems to the attention of their physicians, especially since effective treatment is often available.

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If you have or believe you have Parkinson's disease, then promptly consult a physician and follow your physician's advice.

This publication is not a substitute for a physician's diagnosis of Parkinson's disease or for a physician's prescription of drugs, treatment or operations for Parkinson's disease.