Skeletal & Bone Health

As Parkinson's disease (PD) progresses, it is common to experience changes in the spine, hands and feet.

Nearly every person who lives with PD will experience some degree of muscle rigidity or muscle stiffness. This leads to changes in posture. A third or more people with PD eventually experience changes in posture, although this occurs most often in **advanced PD**. Muscle rigidity associated with PD is most noticeable in the muscles that flex the limbs and trunk. Common experiences include bending of the neck, curling of the trunk, slumping of the shoulders, and bending at the wrists, fingers, elbows, hips and knees. These changes progress over time and some people

wrists, fingers, elbows, hips and knees. These changes progress over time and some people experience severe postural changes with extreme leaning forward or to one side. **Dystonia** occurs less often but can similarly impact the musculoskeletal system. Dystonia causes muscles to spasm and cramp, and is particularly common in the lower legs and feet.

Common Bone Health Changes

- **Frozen shoulder**: stiffness, pain and loss of range of movement in the shoulder, many people experience this symptom before a PD diagnosis.
- **Flexed fingers, toes or feet** (striatal hand and foot): one finger may extend, the thumb may fold inwards, fingers may clamp down onto the palm. In the leg, the foot may flex down or turn in, the big toe may flex upward while the other toes curl under.
- **Stooped posture** (camptocormia): the spine bends forward when walking, in the most severe cases by as much as 90 degrees. This posture arises because the hips and knees are flexed and will go away when lying down.
- **Leaning sideways** (Pisa syndrome): involuntarily tilting of the trunk to one side when sitting, standing or walking; always to the same side.
- **Scoliosis**: sideways twisting, or curvature, of the spine.
- **Dropped head** (anterocollis): the head and neck flex forward; the chin may drop all the way down to the sternum or breastbone (more common in multiple system atrophy than PD).
- **Bone fractures**: people with PD are at risk of broken bones from falling, especially from landing on the hip. Kneecap fractures also are common, painful and sometimes overlooked.
- **Low bone density/osteoporosis**: bones may become weak and at risk for osteoporosis from lack of weight-bearing exercise, like walking, and from too little calcium and vitamin D. Other risk factors for osteoporosis include older age, female sex, low body weight, and smoking. A person with PD who has osteoporosis is more likely to break a bone if they fall.

Therapies

Medical therapies can help relieve the rigidity and muscle contractions that contribute to changes in posture. The approach to therapy very much depends on a person's unique symptoms and overall health. Your doctor may advise:

Dopamine

The most potent medication for PD movement symptoms, carbidopa/levodopa (most often prescribed as Sinemet®). If you do not already take dopamine, starting on this drug may improve symptoms like stooped posture and help prevent changes from becoming permanent. If you already take dopamine, review your dose and medication schedule with your doctor to be sure it is optimal.

Botulinum Toxin Injections

This is often referred to as Botox® but there are other brand names that are used depending on what problem is being treated, and the preferences of your doctor and insurance company. These injections relax muscles that are flexed or having spasms. Injections are given in the specific areas that are affected, such as the hands, feet and neck. It is less commonly used in the larger muscles involved in postural abnormalities of the trunk.

Deep Brain Stimulation (DBS)

This is a surgical procedure for PD which may offer benefit for certain types of muscle contractions when they have not responded to other treatments.

Other Symptoms: Aging or PD?

Because the biggest risk factor for developing PD is age (the average age of diagnosis is 60), skeletal problems associated with aging are often experienced by people with PD. While it is not clear that PD increases the risk or even the severity of these other skeletal conditions, the

problems of PD can make the symptoms of these conditions more prominent.

- Osteoarthritis, the joint damage associated with general wear and tear on the joints, is nearly universal in aging. Osteoarthritis tends to affect larger joints such as the hip and knee.
- Arthritis of the spine is also very common. This may contribute to the development of spinal stenosis, narrowing of the canal in the spine that houses the spinal cord. In severe cases, spinal stenosis causes damage to the nerves as they exit the spine or even to the spinal cord itself.
- Disorders of the fibrous discs between the bones of the spine can also cause pain, or limb numbness or weakness.

It is also important to consider the impact of orthopedic surgeries for non-PD related spine, hip, knee, and shoulder conditions. Surgical therapies (joint replacements, spinal surgery) may be required to treat significant osteoarthritis, disc disease or spinal stenosis. As with any surgical treatment, the risks and benefits should be weighed carefully. Although people with PD can benefit from such surgeries, they may have a longer and more complicated recovery than people without PD.

Tips for Maintaining Healthy Bones, Joints and Muscles

- Talk to your doctor about your PD medication regimen — medication changes that may ease skeletal/spine issues and strategies for optimizing medications to ensure they are most effective for PD.
- Ask your primary care doctor about having your bone-mineral density tested. If it is low, medications are available to help maintain or increase it.
- Discuss testing your blood level of vitamin D with your physician. If it is low, follow your doctor's advice on taking supplements.
- **Reduce the risk of falls** by making the home safer with the advice of an occupational therapist and using the correct assistive devices (including different types of walkers or canes) when needed as instructed by a physical therapist.
- Get active and keep moving. **Exercise** helps maintain strong bones and can ease dystonia among other symptoms. There is no gold standard exercise — whatever

you enjoy and can do is the right exercise. Try to be active at least 30-45 minutes daily. Walking, swimming, yoga, Tai chi and dancing are all good choices.

- See a physical therapist for advice on how to stretch, strengthen and relax your muscles and for a **program of exercises** tailored to your own PD symptoms.
- Ask your doctor about detecting changes in posture early, when they can be treated and before they become permanent.
- Visit your doctor for regular physicals to rule out causes of pain unrelated to PD or changes in the spine unrelated to PD.
- Alternative or **complementary therapies** may be helpful in some cases. For example, acupuncture or massage can help some people with pain and may be considered.

MY PD STORY: JENNIFER

"Although my life had been completely turned upside down, the diagnosis put me on the path to a healthier, more active lifestyle."

READ JENNIFER'S STORY ›

Page reviewed by Dr. Addie Patterson, Movement Disorders Neurologist at the Norman Fixel Institute for Neurological Diseases at the University of Florida, a Parkinson's Foundation Center of Excellence.

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