

Understanding Ataxia

What It Is How It Affects Movement and What You Can Do About It

Presented by Rachel Higdon | Flint Rehab

Introduction

Hi everyone. My name is Rachel Higdon. I am one of the neurologic physical therapists with Flint Rehab's Remote Recovery Program. Today, we are going to talk about ataxia, what it is, how it affects movement, and, most importantly, what we can do about it.

I will start with some key information about ataxia, but I want to spend most of our time answering your questions. If I do not get to your question during the session, please leave it in the chat with your contact information. We receive a lot of responses, so please give us a little time, but I will get back to you.

What Ataxia Is

Ataxia means the body has trouble coordinating movement. It is a symptom, not a diagnosis, and there are many different types. Today, we are going to focus mostly on ataxia due to a neurologic deficit, such as a stroke or brain injury.

Ataxia does not mean the muscles are weak. It means the communication between the brain and the body is not as smooth or predictable as it should be. People with ataxia typically notice changes in three main areas:

- Timing. Movements can start too early or too late, or simply feel out of rhythm.
- Placement. Your hands or feet may overshoot, undershoot, or fail to land exactly where you expect.
- Balance. Walking and turning, in particular, can feel wobbly.

Because all of this is happening together, movements can feel unsteady, shaky, or unpredictable, even when you are trying your best to control them. Our goal in therapy is to help your body create smoother, steadier, and more consistent movement patterns over time.

Why Ataxia Happens

Ataxia happens when the part of the brain that organizes movement, known as the cerebellum, is not sending signals smoothly. The cerebellum is essentially the body's movement quality-control center. It does not create movement; it organizes movement. It helps you plan a movement, adjust it while it is happening, and correct small errors automatically. It also helps keep you steady when you walk or reach, and it helps you learn new movement patterns over time.

When the cerebellum is injured, such as after a neurologic event like a stroke or brain injury, those automatic corrections and adjustments do not come through as clearly. Movements become less accurate, balance reactions slow down, and you have to use more conscious effort to control your

body. This is the root reason ataxia feels so unsteady and unpredictable. That fine-tuning system is not working the way it should.

How Ataxia Can Affect Daily Movement

Ataxia can affect different parts of the body, so symptoms may appear in several areas of daily movement.

- **Walking.** Many people develop a wider base of support and walk with their feet farther apart because it feels safer. You might see staggering or drifting from side to side. Turning can be especially challenging because the body has trouble coordinating multiple steps at once.
- **Arm and hand movement.** Ataxia can cause hand tremors or difficulty with fine-motor tasks such as writing, buttoning, or picking up small objects. Movements can feel shaky and difficult to control.
- **Speech.** Some people notice slurred or uneven speech because the muscles that coordinate breathing and voice timing are not working smoothly together. These are symptoms you may work on with a speech-language pathologist.
- **Vision.** You may experience blurred vision when moving your head or eyes, or a jumping eye movement known as nystagmus. This can make reading, scanning the environment, and walking in busy spaces more difficult.

All of these symptoms come from the same underlying issue: the body is trying to move without the brain's normal fine-tuning and coordination. That is why movements feel unpredictable and harder to control.

The following are some of the core rehabilitation tools we use to improve movement control with ataxia, and they can all be incorporated at home. This is not an exhaustive list. Your physical therapist or physician may discuss other options with you. Each approach addresses a different part of coordination, whether that is timing, accuracy, balance, or smoothness of movement.

High Repetition Training

Before we get into specific exercises, we need to talk about the most important principle in ataxia rehabilitation: high-repetition training. The cerebellum, which acts as the movement quality-control center, learns through repetition. It improves movement by getting repeated chances to correct timing, accuracy, and balance.

Research on motor learning shows that the nervous system needs hundreds of repetitions per session for meaningful change, often 300 to 600 repetitions of a single movement pattern, to improve timing and reduce variability. This is why walking is such a powerful tool: every step is a repetition. Strengthening, coordination drills, and balance work are all more effective when performed with higher repetition. Remember: more repetition supports smoother, steadier movements over time.

Proximal Strengthening

Proximal strengthening means strengthening the muscles closest to the center of the body, including the core, hips, pelvis, trunk extensors, and even the shoulders. These muscles act as the foundation for stability.

Strengthening these muscles does not directly fix ataxia or change coordination because ataxia comes from the brain. However, research shows that improving core stability reduces the risk of losing balance due to ataxia, improves your ability to recover from sway, and gives your arms and legs a steadier base from which to move. A stronger center makes standing, walking, and transfers more stable and predictable. Although proximal strengthening does not cure ataxia, it supports every movement you make.

Not all proximal strengthening exercises need to be performed in standing, especially at the beginning. Many effective proximal exercises happen on the floor or in supported positions, such as quadruped, where you are on your hands and knees. This allows you to build stability without fighting your balance at the same time. After a rehabilitation evaluation, your therapist can give you specific exercises tailored to target these muscles.

Target Based Coordination Training

Target-based coordination training focuses on improving how accurately your hands and feet land during movement. People with ataxia often overshoot or undershoot their targets. This is called dysmetria. It occurs because the cerebellum has trouble scaling the movement.

Research shows that task-specific, repeated accuracy practice can help reduce this problem by giving the nervous system repeated opportunities to correct movement errors. This is what we mean by error-based practice. Your brain learns by trying a movement, noticing the error, and correcting it.

Target stepping or reaching toward objects, such as cards, makes those errors clear. You can see or feel when you overshoot or undershoot, and every repetition gives your nervous system another chance to adjust the movement. Activities such as tracing or segmented walking - slowing down and thinking through each part of the step cycle - can also improve control and reduce overshooting. These exercises use high-repetition, error-based practice to improve spatial accuracy in ataxia.

Balance Training

Balance training is essential for ataxia because people with cerebellar injuries have increased postural sway, meaning they may shift from side to side, and delayed balance reactions. Balance exercises challenge the system in controlled ways. Changing your foot position and shifting your weight can help improve postural stability.

Perturbation training teaches the body to react more quickly when balance is disturbed. For example, if someone nudges you or pushes you off center, your body needs to learn how to correct itself and return to the middle. As you improve, reaching, stepping, and changing speed or direction while walking can train the automatic balance strategies used in daily life.

Research shows that repeated balance challenges can reduce sway by up to 30% after four to eight weeks of structured practice and can improve balance reactions. These exercises are generally recommended more frequently than strengthening exercises. Evidence indicates that balance exercises may need to be performed four to five times per week rather than only two to three times per week, again because repetition matters.

For many people with ataxia, standing can be difficult even without added challenges. For safety, we recommend using a corner setup, with your back toward the corner and a chair or assistive device in front of you. If you lose your balance in any direction because of sway, you have a form of support that can help reduce the risk of falling. Always listen to your therapist and ask whether they recommend supervision from a family member or caregiver while you perform these exercises.

Walking and Weight Bearing Practice

The best way to improve walking is by practicing walking. Walking gives you hundreds to thousands of repetitions, which is exactly what the nervous system needs to improve timing, balance, and foot placement. Research suggests that we need 300 to 600 repetitions to change a movement pattern. Even a short walk can provide more than 1,000 steps, making walking one of the most effective therapies for ataxia once you can tolerate it safely.

Slow, controlled walking is more beneficial than fast walking because it reduces variability and gives your brain time to process each step. As you improve, practice variety, including different speeds, turning, and stepping around obstacles. This helps train adaptability, which is often impaired. These variations challenge balance, coordination, and timing in real-world ways and can help reduce staggering, overshooting, and other variability.

If you cannot walk, daily weight-bearing positions, such as standing, can still be very helpful. Weight bearing does not directly fix coordination, but it improves the stability your body needs to move more safely as you work toward walking. It increases activation of the core, trunk, pelvis, and other muscles that help keep you upright. Standing and weight bearing also boost proprioceptive input, which helps the brain sense where the body is in space. Although weight bearing does not cure ataxia, it can reduce sway by giving your body a stronger foundation for walking and coordination work. Even if you cannot walk, try to stand daily when it is safe and appropriate for you.

External Cueing

Safety is always our number-one priority, and using external cueing can help. External cueing means using outside signals to guide movement and make it easier and safer at home. People with ataxia often have difficulty with internal timing and scaling movement because the brain is not providing smooth feedback. Evidence indicates that visual or auditory cues can bypass impaired internal timing and provide a clear structure.

- Visual cues can include placing tape on the floor to guide each step or using countertop lines to improve foot and hand placement.
- Mirrors provide immediate visual feedback that can help reduce overshooting.

- Auditory cues can include a metronome, rhythmic counting, music therapy, or simple verbal prompts such as slow down, step, and pause.

External cueing does not fix ataxia, but it can improve consistency and safety while you perform your exercises.

Factors That Can Temporarily Worsen Ataxia

Before the questions and answers, it is important to review a few common factors that can temporarily worsen ataxia symptoms at home.

- Fatigue can increase postural sway by up to 30%, making balance less stable. After a hard workout or near the end of the day, your body may feel tired and your balance may be more affected.
- Poor sleep can reduce motor accuracy and increase reaction time.
- Fast movements can worsen overshooting and undershooting because the brain does not have time to correct errors, increasing variability by up to 40%.
- Dual-tasking can be a valuable treatment once you are ready, but adding it too early can increase cognitive load and temporarily make ataxia worse. An example is walking while holding a conversation. Follow your therapist's guidance about when to introduce dual-task exercises.
- Anxiety, stress, and alcohol can impair cerebellar processing and increase staggering while you walk.
- Certain medications, including some antihistamines and sleep medications, may worsen ataxia. Do not change your medications without speaking with your physician. If your symptoms worsen while taking them, you may need to use your assistive device more or allow yourself additional rest so you remain as safe as possible.
- Visual overload makes it harder for the brain to process spatial information. This can increase sway and reduce accuracy, especially in busy or cluttered environments such as long hallways or grocery stores.

These factors do not necessarily mean someone is regressing. They are temporary triggers that can make symptoms more noticeable. Keep them in mind as you perform your exercises throughout the day.

Flint Rehab Remote Recovery Program

Flint Rehab offers a Remote Recovery Program in which you are evaluated by me or another neurotherapist and work one-on-one with that person to create a personalized exercise program and receive ongoing virtual neurologic support and care. Webinar attendees are being offered 50% off the first month with the code shown during the presentation. You will receive an email reminder after the webinar, and the code will be valid for one week.

Questions and Answers

When You Lose Your Balance How Do You Get It Back

This is something your physical therapist should evaluate to determine why you are losing your balance. Balance loss can occur for many reasons. If it is coming from ataxia, incorporating some of the exercises discussed today may be beneficial. However, it may also come from other stroke symptoms.

For example, numbness or decreased sensation in the feet makes it harder to balance. Weakness in certain areas can also affect balance, as can vestibular impairments secondary to a stroke. Today's webinar focused mainly on balance impairments caused by ataxia. If you are experiencing generalized balance impairments, talk with your physical therapist so the cause can be identified and your treatment program and exercises can target that source.

Is Going to the Gym Better for Improving Ataxia

It depends on what you are working toward and where you are in your recovery. If you can walk independently and want to focus on strengthening, the gym can be a great place to work on proximal stability, core strength, and leg strength. Cardio machines can also help you accumulate steps and high repetitions.

If you still need supervision, there are many activities you can perform safely at home, including exercises in bed, on the floor when appropriate, or while seated. These can help improve stability and address ataxia.

What Is the Difference Between Ataxia and Apraxia

Ataxia is difficulty with coordination. Apraxia is difficulty carrying out a specific learned movement pattern, even when you have the physical ability to make the individual movements. For example, you may be able to rotate your hand but have trouble organizing the movement needed to grasp and turn a door handle. The main issue with apraxia may not be the coordination difficulty or sway seen with ataxia. A therapist can evaluate which challenge is affecting you.

Will a Recording of the Webinar Be Available

Yes. We will send a recording link to the email address you used to register for the webinar.

How Are Balance and Walking Assessments Used in Therapy

Therapists use specialized assessments to measure changes in balance, walking, and the rate of recovery. Some outcome measures look specifically at ataxia, such as the Scale for the Assessment and Rating of Ataxia, also known as the SARA scale. However, we also want to understand how physical therapy is improving your actual function.

The Berg Balance Scale looks at fall risk and static and dynamic balance. The Timed Up and Go test, often called the TUG test, looks at functional mobility and walking performance as they relate to balance. These tests help us focus not only on changes in the impairment itself but also on what matters most: your balance, walking, and risk of falling. Small changes in ataxia and sway can be difficult to grade, so functional measures are particularly useful.

Is Post Stroke Dizziness Common and What Can Be Done About It

Yes, post-stroke dizziness is common, and it can have several causes. Ataxia can affect vision and may lead to double vision, visual shakiness, or nystagmus. Dizziness can also come from another visual problem or from a vestibular issue involving the inner ear.

You should be evaluated to identify the source. The cause may be central, meaning it comes from the brain, or peripheral, meaning it comes more from the inner-ear or visual system. Identifying the source helps determine how to address the dizziness and whether you should see a neuro-ophthalmologist, work with a vestibular therapist, or discuss medication-based treatment with your physician.

After a Stroke Should You Train the Brain More Than the Muscles

This depends on your primary limitations. After a stroke, you may have significant weakness, hemiparesis, or paralysis in certain muscles. If weakness is the main limiting factor, you will need to target it. Motor exercises that challenge the brain are also beneficial.

An evaluation is important because it identifies your main limitation and helps determine what to address. Strategies such as weight bearing, getting upright, standing, and walking will often be part of the plan of care, but the right approach depends on where you are in recovery, how long it has been since the stroke, and which limitations affect you most.

Will the Presentation Slides Be Available

Yes. We will send the slides after the webinar.

What Are the Different Types of Ataxia

There are many different types of ataxia, including cerebellar, sensory, and vestibular ataxia. There are also hereditary and progressive forms. Today's webinar was a general overview focused on ataxia following stroke and brain injury. The different forms of ataxia can be covered in more detail in another webinar or discussion.

Are There Doctors Who Specialize in Ataxia

Some clinicians work more specifically with movement disorders. In general, a neurologist or a physical medicine and rehabilitation physician can be particularly helpful. You may hear the latter referred to as a PM&R physician. These physicians can provide medical support after a stroke or brain injury.

How Can You Safely Perform Cardio Exercise with Ataxia

When you perform cardio exercise, you want to work hard enough to receive the cardiovascular benefits. However, remember that fatigue can temporarily worsen ataxia. You may feel fine while walking, cycling, using a treadmill, or performing another activity, but notice greater fatigue and unsteadiness when you stop.

Plan for that possibility. Have someone with you or keep your wheelchair, walker, or another assistive device nearby so you can return home or to your chair safely if your ataxia worsens. If standing is not safe, you can perform cardio while seated on a bike. When it is safe for you,

walking also provides weight bearing and proprioceptive input through the bottoms of your feet as you press into the floor.

Can Robotic Devices or Exoskeletons Help with Ataxia

They can help, depending on the situation. Robotic devices and exoskeletons can be tools for achieving high repetitions of walking. If ataxia limits you to only 10 steps per day, for example, a device used during therapy may help you reach the repetitions needed for practice.

We want to make sure the movement is not too passive and that you are still activating your muscles. These devices can help build endurance, challenge balance, increase repetitions, and provide opportunities for standing and weight bearing. They are tools to incorporate alongside other exercises rather than replacements for the rest of your program.

Can Ataxia Improve Years After a Stroke or Brain Injury

Ataxia caused by a stroke or brain injury is not typically progressive. This is different from certain progressive or hereditary forms of ataxia. Even when ataxia itself is not progressing, other factors can make it appear worse. If you are less mobile and become deconditioned from not standing or walking as much, your core and other proximal muscles can weaken. You may then notice the ataxia more because your stability has declined and you cannot control it as effectively.

Ataxia can improve. The amount of progress depends on how long you have had it and how intense the symptoms are, but with eight to 12 weeks of consistent practice - ideally daily or at least four to five times per week with high repetitions - we can begin to see reduced variability and improved stability. Most improvement occurs within the first year after a stroke or neurologic event, but improvement can still occur later, including in the chronic stages, especially when you consistently practice the right activities.

Closing

Thank you for joining and listening to the webinar. If your individual question was not answered, please make sure your contact information and email address are included so we can respond. Flint Rehab's Remote Recovery Program is also available if you would like to speak one-on-one with me or another neurologic therapist and create a more specific program for your needs. I appreciate your time.