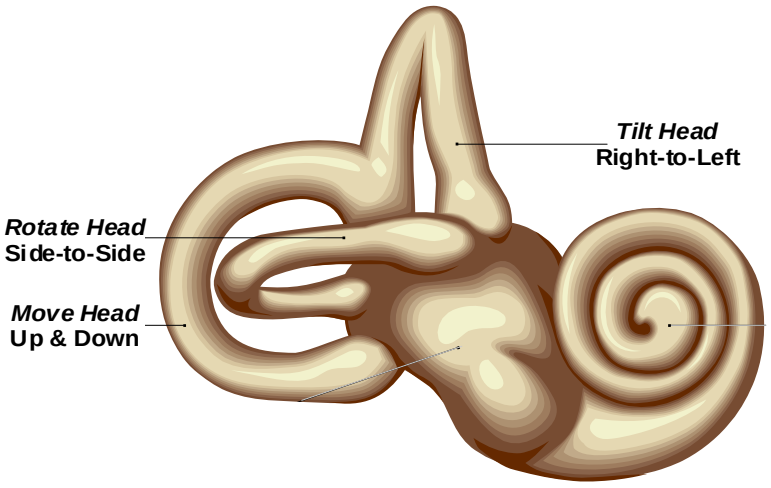
Regaining Balance (Lost by an *Acoustic Neuroma*)

In December 2001, I became deaf in my left ear and went to an ENT physician to find out why—I had an acoustic neuroma (a non-malignant slow-growing tumor on the 8th cranial/acoustic nerve). The year before I had perfect hearing in that ear, although I did noticed balance problems for the two proceeding years. Had I heeded those balance problems and known about acoustic neuromas a year or two before, I wouldn't be deaf in my left ear today. It is conservatively estimated that 1 in every 100,000 people have an acoustic neuroma, less conservative estimates put it at 1 in 10,000, some even say 1 in 1,000, which means that between 3,000 and 300,000 people in the USA have an acoustic neuroma and most of them won't know it before it's too late. Although acoustic neuromas cause deafness and balance problems, they can also cause loss of facial control and even death if they invade the brain stem. They can be removed surgically or "killed" with focused radiation. After going "on-line" and listening to the horror stories of surgical removal, and after discussing it with two brain surgeons I decided to go the "Gamma Knife" radiation route. I arrived early in the morning, had the Gamma Knife surgery and was out that afternoon with no side effects; in fact I changed a flat tire on my wife's minivan hours after surgery. Today the 30% smaller tumor is DNA dead, but the deafness and poor balance still exist—the balance problems can be controlled.

The problem with the inner ear balance system being destroyed in one ear is that the cerebellum has to work with one good ear giving accurate balance data and the other ear giving inaccurate data, at best. In trying to figure out balance the cerebellum is trying to use old memories which don't apply any more to information from the damaged semi-circular canals, eyes and somatosensory system—it doesn't know what to do and tries to establish new memories to deal with every situation. Thus, it becomes overworked, receiving much blood with neurons firing chaotically to the point of fatigue or damage—making it very warm to the touch and causing constant headaches and wooziness.

By the time of the surgery, my balance had digressed to the point where I only had my eyes and somatosensory system to balance with; standing still was not a problem, but moving was. My semicircular canals were essentially useless, even the healthy right, due to the misinformation from the damaged left. The fact is, seven years later I still have poor balance in the dark, especially on uneven ground. I even loose my balance in daylight if I turn my head too quickly and lose sight of stable objects to gauge my position with. But this one can learn to live with; the pain and "wooziness" of constant cerebella headaches is another matter. There is though, a way to "reset the cerebellum" and distract it from overtaxing itself, sort of like pressing a reset button; this is accomplished through what I call "semicircular canal exercises". I figured that while walking, the cerebellum had to consider the erroneous information from *all three* left semi-circular canals (see the diagram), so I would train myself to walk using *one* semicircular canal at a time, eliminating the confusion from the other two. I used a treadmill (any cheap treadmill will do) to walk at a natural pace, arms swinging naturally, with my head facing straight forward until I felt *stable* walking at that pace. Then I would exercise one semicircular canal at a time using the routine indicated below. At first I had to do these exercises every other day for a few months, but now I only need to do them monthly to reset my cerebellum for another month.



Treadmill Exercise Routine—Chronology and Procedures

Before doing these exercises on a treadmill, try to visualize yourself doing them, or even better, do them without walking before getting on the treadmill.

1. On the treadmill, start out by waking at a natural pace, arms swinging naturally; with your head fixed and facing forward until you feel *stable*. It will be obvious when you're stale because you don't feel a tendency to fall (never grasp the railings unless you start to fall). Concentrate on feeling the treadmill under your feet; you are trying to strengthen and retrain your feet and leg muscles to walk again, which will take time and concentration. At first, this natural pace may be all that you can do, maybe even for as long as 15 to 20 minutes, but after a few days or maybe a week you should be stable enough to do the semicircular canal exercises.

2. Once you feel stable naturally walking you can proceed to the next step, working the semicircular canals that are affected by tilting your right ear towards your right shoulder and then your left ear towards your left shoulder. (You are just naturally walking and tilting your head from side to side while facing straight forward.)

    A. Step forward with your *right* foot and tilt your head to the right as your right arm naturally swings forward and your left arm naturally swings backward.

    B. Step forward with your *left* foot (still keeping your head tilted to the right) as your left arm naturally swings forward and your right arm naturally swings backward. In essence, in A and B you are taking two steps with your head tilted to the *right*.

    C. Next, step forward with your *right* foot and tilt your head from the right all the way to the left, as your right arm naturally swings forward and your left arm naturally swings backward.

    D. Step forward with your *left* foot (still keeping your head tilted to the left) as your left arm naturally swings forward and your right arm naturally swings backward. In essence, in C and D you are taking two steps with your head tilted to the *left*.

    E. Repeat steps A through D *at least* 20 times until you feel stable naturally walking and tilting your forward-facing head from side to side. You will fall many times at first, until you become stable doing the exercises. If you fall during an exercise, grasp the handrails to regain your balance and then start walking naturally again (as in step 1. above) until you feel stable. Once stable, redo that exercise until done with exercisers A, B, C, D. This will be frustrating at first, but concentrating on controlling your leg and feet muscles will speed your progress, since they are the part of your somatosensory system that your cerebellum is trying to control to maintain your balance. By the way, even people without balance problems find these exercises difficult.

3. Once you feel stable naturally walking while tilting your head you can proceed to working the semicircular canals that are affected by only moving your head up and down.

    A. Step forward with your *right* foot and move your head up to the ceiling as your right arm naturally swings forward and your left arm naturally swings backward.

    B. Step forward with your *left* foot (still keeping your head up) as your left arm naturally swings forward and your right arm naturally swings backward. In essence, in A and B you are taking two steps with your head facing up.

    C. Next, step forward with your *right* foot and move your head down towards the floor, as your right arm naturally swings forward and your left arm naturally swings backward.

    D. Step forward with your *left* foot (still keeping your head down) as your left arm naturally swings forward and your right arm naturally swings backward. In essence, in C and D you are taking two steps with your head down.

E. Repeat steps A through D *at least* 20 times until you feel stable naturally walking while moving your head up and down. If you fall during an exercise start over again, naturally walking until you feel stable and then redoing that exercise until done with A, B, C, D.

4. Once you feel stable, naturally walking while moving your forward-facing head up and down you can proceed to working the semicircular canals that are affected by rotating your head left and right.
   A. Step forward with your *right* foot and rotate your head 90° to the right as your right arm naturally swings forward and your left arm naturally swings backward.
   B. Step forward with your *left* foot (still facing right) as your left arm naturally swings forward and your right arm naturally swings backward. In essence, in A and B you are taking two steps with your head facing 90° to the right.
   C. Next, step forward with your *right* foot and rotate your head 180° (facing 90° to the left) as your right arm naturally swings forward and your left arm naturally swings backward.
   D. Step forward with your *left* foot (still keeping your head 90° to the left) as your left arm naturally swings forward and your right arm naturally swings backward. In essence, in C and D you are taking two steps with your head facing 90° to the left.
   E. Repeat steps A through D *at least* 20 times until you feel stable naturally walking while rotating your head 90° to the left and right. If you fall during an exercise start over again, naturally walking until you feel stable and then redoing that exercise until done with A, B, C, D.

Steps 1 through 4 represent the basic exercises, which may take many weeks to perfect (that is, go through all four steps without falling). Once perfected, you can move on to doing modified versions of exercises 1 through 4, essentially doing a *one step* exercise after doing the two step exercise. These modifications allow you to build up more balance memories (one step) based on established balance memories (two step) that will make your balance even more stable and controlled.

5. Start out with step 1 above as usual until you feel stable just walking naturally.
6. Next go to step 2 above and do it in the following revised manner:
   A. Do exercise 2, A through D in the usual “two step” manner 20 times.
   B. Redo the exercises only this time taking one step instead of two:
      1) Step forward with your *right* foot and tilt your head to the *right* as your right arm naturally swings forward and your left arm naturally swings backward.
      2) Step forward with your *left* foot and tilt your head to the *left* as your left arm naturally swings forward and your right arm naturally swings backward.
      3) Repeat steps 1 and 2 *at least* 20 times until you feel stable naturally alternating the tilting of your head towards your right and left shoulders. If you fall during an exercise, start over again, naturally walking until you feel stable and then redoing that exercises until done with 1 and 2. Concentrate on controlling your leg and feet muscles at this more rapid rate.
7. Next go to step 3 above and do it in the following revised manner:
   A. Do exercise 3, A through D in the usual “two step” manner 20 times.
   B. Redo the exercises only this time taking one step instead of two:
      1) Step forward with your *right* foot and move your head up to the ceiling as your right arm naturally swings forward and your left arm naturally swings backward.

2) Step forward with your *left* foot and move your head down to the floor as your left arm naturally swings forward and your right arm naturally swings backward.

3) Repeat steps 1 and 2 *at least* 20 times each until you feel stable naturally moving your head up and down as you walk. If you fall during an exercise, start over again, naturally walking until you feel stable and then redoing that exercises until done with 1 and 2. Concentrate on controlling your leg and feet muscles at this more rapid rate.

8. Go to step 4 above and do it in the following revised manner:

   A. Do exercise 4, A through D in the usual "two step" manner 20 times.

   B. Redo the exercises only this time taking one step instead of two:

      1) Step forward with your *right* foot and rotate your head 90° to the *right* as your right arm naturally swings forward and your left arm naturally swings backward.

      2) Step forward with your *left* foot and rotate your head 180° (facing 90° to the *left*) as your left arm naturally swings forward and your right arm naturally swings backward.

      3) Repeat steps 1 and 2 *at least* 20 times each until you feel stable naturally rotating your head left to right. If you fall during an exercise, start over again, naturally walking until you feel stable and then redoing that exercises until done with 1 and 2. Concentrate on controlling your leg and feet muscles at this more rapid rate.

It should take only a week or two to perfect the combined two-step/one-step exercises if you do them about three times a week (for example, Monday-Wednesday-Friday). Once perfected, you will only need to do the exercises once a week for a month or two. After your cerebellum has learned to control your balance you will only need to do the combined exercises once a month, Since it takes less than five minutes to do once a month, you will probably forget to do them. Don't worry though, your cerebella pain and wooziness will remind you if you forget.

Also, if you overdo the alcohol you will need to reset your cerebellum more often. Sometimes though, what seems to be cerebella pain is just the usual hangover pain since you will be able to do the exercises effortlessly, indicating that your cerebellum is still in control—good luck.