**Test 1 - Static Equilibrium**

**Procedures**

1. Have the subject stand in front of the whiteboard, toes against the wall (or as close as possible), with arms at sides.
   1. The subject may not lean against the wall or be supported in any way.
2. Tell the subject to stand perfectly still.
3. Use a marker to quickly draw an outline of the subject’s shoulders to help determine the severity of movement during Step 4.
4. Tell the subject to close his/her eyes and observe any movement in the subject’s shoulders.
   1. Note that although the subject may move slightly, the posture should always be corrected.
   2. If the static equilibrium receptors are not functioning, the subject will not be able to maintain posture and will exhibit large swaying movements or will fall.

Have the subject record THEIR data on their data sheet

**Test 2 - Locating Sound**

*Humans locate the direction of sound according to how fast it is detected by either or both ears. A difference in the hearing ability of the two ears can lead to a mistaken judgment about the direction of sound.*

**Procedures**

1. Ask the subject to be seated, with eyes closed
2. Strike a tuning fork together and position it at one of the five locations listed below.
3. Have the subject record THEIR data in their data table.
4. Strike the tuning fork again and position it at a second location listed below.
5. Continue the process until all five locations have been tested.
   1. Test the locations at random to be sure your subject isn’t cheating!

**Locations to Test**

* Directly below and behind the head
* Directly behind the head
* Directly above the head
* Directly in front of the face
* To the side of the head (right or left, your choice)

**Test 3 - Unilateral Deafness – Weber Test**

*This test determines if the subject is has hearing deficits in one ear. Normal response would be that the sound is heard equally loud in both ears. If the sound is louder in one ear, then the subject may have unilateral deafness in that ear.  
  
Part 2 mimics what it would be like to have deafness in one ear by “plugging” one ear using cotton (or your hand).*

**Procedures**

**Part 1**

1. Have the subject sit with their head erect and facing forward
2. Strike a tuning fork and place it in the center of the subject’s forehead
3. Ask the subject if the sound is equally loud in both ears or louder in one ear.
4. Have them record THEIR data on their data sheet.
   1. If the sound is equally loud in both ears, the subject has normal hearing (or deafness in both ears).
   2. If the sound is heard louder in one ear, then the subject may have unilateral deafness (deafness in one ear) in that ear.

**Part 2**

1. Have the subject place a cotton ball in one ear and repeat the Weber Test.
2. Have them record their data on their data sheet.

**Test 4 - Static Equilibrium**

**Procedures**

1. Have the subject stand on one foot, knee flexed, with his/her arms lifted to the sides.
2. Have the subject keep their eyes open and time how long they are able to maintain their balance (up to one minute)
   1. Stop the time at any point their elevated foot or hands are used to regain balance
3. Have the subject record THEIR time on their data table
4. Have the subject stand on their other foot and repeat the procedure.
5. Repeat the test on each foot with his/her eyes closed and record the data.

**Test 5 - Dynamic Equilibrium – Barany Test**

**Procedures**

*This test requires 4 people – one test subject and 2-3 people to hold the chair in place.*

1. Choose a subject from your group who does not readily experience dizziness or become nauseated when rotated. \*Note – if the subject does become nauseated during the test, stop the rotation.
2. Have the subject sit on the “spinny-chair” and hold on to the arms for safety and lift their legs so that the chair is able to rotate freely.
3. Have the remaining 3 students surround the chair and place a foot on the leg of the chair to attempt to hold it in place during rotation.
4. Have the subject slightly tilt his or her head forward (slight bend of chin to chest), focus on a distant object, and keep both eyes open.
5. Carefully turn the chair clockwise (to the right) for 10 turns, at a pace of 1 turn for every 2 seconds.
   * This will not be an extremely fast rotation – please do not go crazy.
6. **After stopping the rotation, immediately observe the directions of the subject’s eyeballs.**
7. Record the direction of eye movement in the data table.
   * ***Lateral movement*** – stimulation of receptors in the lateral semicircular canals
   * ***Vertical movement*** – stimulation of receptors in the anterior semicircular canals
   * ***Rotational movement*** – stimulation of receptors in the posterior semicircular canals
8. If the subject is able to continue, repeat the process:
   * With the subject’s head tilted toward one shoulder
   * With the subject’s head tilted slightly backward