

Outstanding Care,
Compassionate People,
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Sherwood Forest Hospitals
NHS Foundation Trust

Audiology Services

Vestibular Rehabilitation Management Plan



What is dizziness?

'Dizziness' is a term used to explain the feelings we experience when there is something wrong with our sense of balance.

The term 'dizziness' can mean different things to different people. Dizziness can be described as feeling light headed, giddy or unsteady. In some cases this may be accompanied by feelings of nausea or even vomiting. In any case, this condition can be very frightening, even though it is not life threatening.

Vertigo is the term used to describe the form of dizziness where a person experiences the sensation that they or their surroundings are moving when they are standing still.

The Balance system

In order to maintain our balance, we rely on three sources of information:

- Input from the eyes enables us to see where we are in relation to our surroundings
- Muscle receptors in our neck, back and legs tell the brain whether we are standing, sitting or moving
- Located in the inner part of each ear, we have a balance mechanism (vestibular labyrinth). The labyrinths send equal impulses to the brain, letting us know where our head is in relation to the ground and environment.

All this information helps us to maintain our balance and to move around i.e. walk and run. If one or more of these inputs are not working correctly, our ability to maintain our balance will be upset.

The Vestibular system

The ear is made up of 3 main parts
- the outer, middle and inner ear.

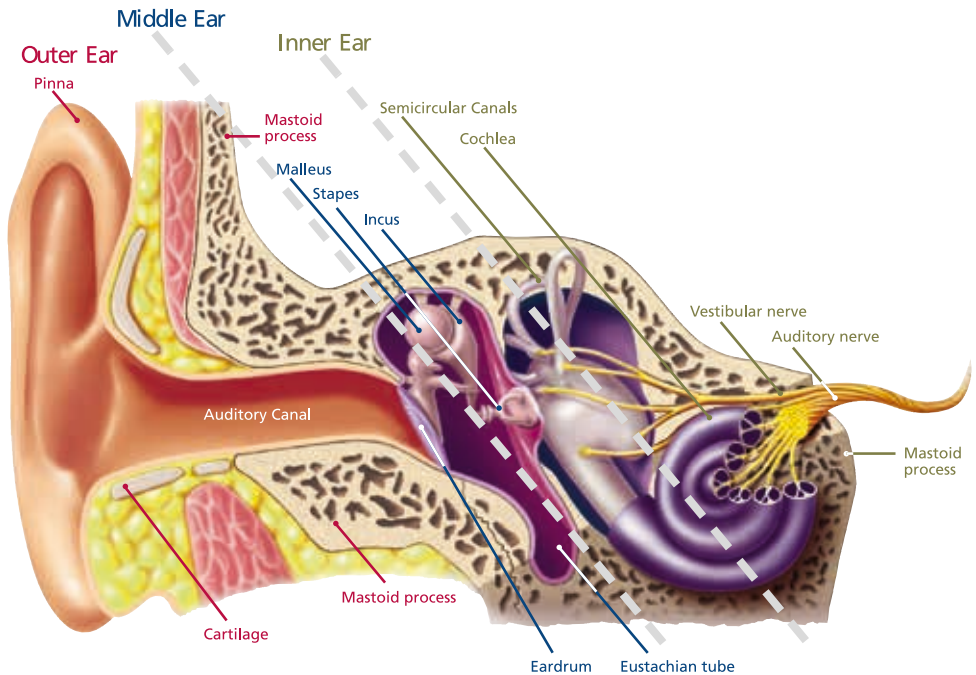
The inner ear is then made up of the Cochlea (the organ responsible for our hearing) and the Vestibular organs (responsible for balance).

There are three sets of tubes (semicircular canals) in each vestibular system and these detect when you move your head. There are also two structures called the "otoliths" which

inform your brain when your head is moving in a straight line and indicate the position of your head in respect of the pull of gravity.

Dizziness or vertigo can occur when the right and left balance systems do not work together in symmetry and your brain thinks your head is moving when it is not.

Anatomy of the Ear



Balance problems can occur for many reasons including:

- Labyrinthitis/vestibular neuritis - inflammation of the vestibular portion of the inner ear/the vestibular nerve. Symptoms involve an acute attack of constant rotatory vertigo which may be accompanied by nausea and / or vomiting and can worsen with sudden head movements.
- Meniere's disease - a long term, progressive disease which damages both the balance and hearing parts of the inner ear. The main symptoms of the disease are vertigo, tinnitus and hearing loss.

Other causes include BPPV, head injury, ear surgery, central neurological disorders, degeneration of the balance system due to aging, or decompensation of a previously compensated injury due to stress or other illness. Often, no specific cause can be identified.

Causes of dizziness

Vestibular Rehabilitation

Vestibular rehabilitation is a form of treatment suitable for some individuals with dizziness or imbalance. It usually involves putting together a plan involving exercises which, over time, should help with your dizziness or imbalance.

The purpose of vestibular rehabilitation exercises is to help the brain to build up a tolerance to those positions or movements that might bring on dizziness. The more often that the dizziness is brought on in this way, the more quickly the brain will get used to it, and the dizziness will be overcome.

People who suffer from dizziness have generally learned how to avoid doing the things that make them feel dizzy. A vestibular rehabilitation programme actually encourages people to do these things within a situation that they themselves are fully in control of. You will need willpower and perseverance to complete the programme, and the encouragement of a partner or friend will be a great advantage. However, the more regularly you practice the exercises, the faster and more complete will be your recovery.

Your audiologist has selected the most appropriate vestibular rehabilitation plan for you.

☐ **Cawthorne-Cooksey exercises**

☐ **Gaze stabilisation exercises**

☐ **Breathing exercises**

☐ **Ankle and hip strategy exercises**

☐ **Otolith Desensitisation exercises**

☐ **Epley Manoeuvre**

These exercises are designed to allow your vestibular system to compensate in a gentle manner by gradually building up from one exercise to the next. It is also important to note that you may experience mild dizziness whilst doing these exercises. This is completely normal and it is important to persevere in order to feel any benefit.

Starting at section A, complete ten repetitions of the exercise five times a day until you can do it without provoking any symptoms. Only move onto the next exercise once you can do the current exercise without provoking any symptoms.

In order to pace your exercises, so you do not move on to exercises that are too difficult before you are ready, you may also like to try using a 'number rating scale'.

For example, 0 through to 5 for the severity of your symptoms (0 being no symptoms and 5 being severe symptoms). You would then only move on to the next exercise once the current exercise evoked a 0 on the scale, for three days in a row.

Please be aware that for some exercises it may take a while for you to get used to it.

Use the table on page 15 to help you keep track of your exercises.

In section A, the exercises should be done with eyes open. In all other sections, exercises should be carried out five times with eyes open and five times with eyes shut.

Section A:

Sitting first, then when more confident, standing.

1. Keeping the head still, move eyes up and down
2. Keeping head still, move eyes left to right
3. Focus on your index finger as you bring it from arm's length away up to your nose, then out again.

Section B:

Sitting first, then when more confident, standing.

1. Move head forward (chin to chest) and back again
2. Move head from side to side

Section C:

Standing.

1. Holding a soft ball, touch it down in front of you, then stand up again.
2. As above, but twisting to the left and right, before you stand up again.
3. Throw the ball from one hand to the other, watching the ball all the time.
4. Pass the ball between your knees and then right up over your head, watching the ball all the time.
5. Drop your head and shoulders down to the left and to the right, and touch the outside of your knees.

Section C:

Standing.

6. Sit down, then stand up and turn around on the spot. Then sit down, stand up and turn around in the opposite direction.*
7. Without sitting down, turn on the spot in both directions.*
8. If space permits, walk round in a circle with a partner, throwing the ball to each other as you move around.*
9. Link arms with your partner and walk round each other in a circle* (you might both feel dizzy!)*

Section D:

Lying down

1. Turn your head from left to right.
2. Roll your whole body from left to right
3. As above, but sitting up in between rolling from one side to the other.

Ideally, the exercises should be carried out 5 times a day. However, this may not always be possible. Try to do them as often as you can. Some of the exercises, particularly those in section A and B, can be practised wherever you are, whilst those marked with an asterisk (*) should only be done with somebody else present, at least to start with.

DON'T BE AFRAID TO STOP WHEN YOU HAVE HAD ENOUGH!

In any case you should stop if you begin to feel sick. You can always carry on later.

Sometimes after a dizzy spell, or periods of unsteadiness, it is helpful to strengthen the visual input to balance and relearn the task of focusing on targets while you move your head around. These are the kind of skills which will help you to do this while outdoors, as in crossing a road, and also in more complex visual environments, like supermarkets.

Do not do these exercises when you have a headache or feel nauseous.

You should repeat the exercises for approximately 1-2 minutes each 4 times a day. The duration of each of the exercises may make you feel dizzy or even nauseated but you should try to complete the full 1-2 minutes of the exercise, resting in between, to prevent the nausea from developing too much. During these exercises, try to maintain your fixation on the target, so that the image does not blur. Build up the number of movements, and the speed you do them at, over time.

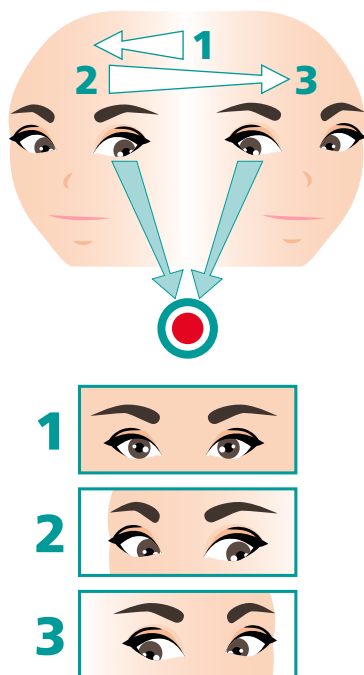
Use the table on **page 12** to keep track of your progress.

Section A:

Gaze stabilisation with fixed target

1. A business card or other target with words on it is taped on a wall in front of you so you can read it. Move your head gently back and forth horizontally for one minute while keeping the words in focus.
2. This is repeated moving the head up and down for 1 minute. Allow the sensations to fade before moving on.
3. If these exercises do not induce nausea, you can then repeat the exercises using a large pattern such as a chessboard (full-field stimulus), moving the head from side to side: Stare at a square in the middle of the chess board while moving your head and keeping it in focus.
4. The exercise with the chessboard is then repeated moving the head up and down.

You will have achieved your treatment goal, when you can successfully move your head (both up and down, and side to side) without bringing on blurring of vision, or unsteadiness.



Section B:

Gaze stabilisation with moving target.

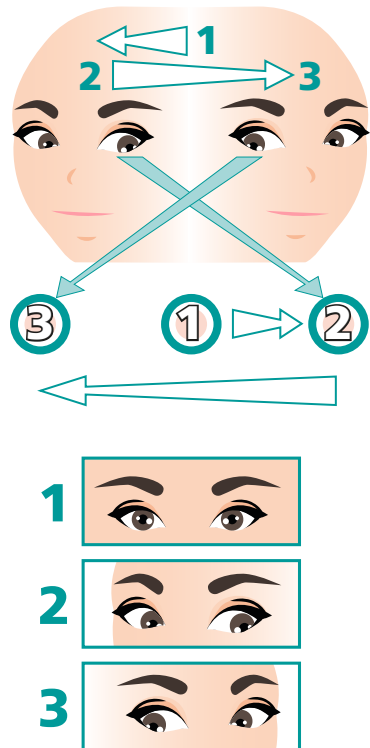
When things have improved you are ready to move onto the following exercise.

1. Hold a business card in front of you so that you can read it. Then move the card and your head back and forth horizontally in opposite directions, keeping the words in focus for 1 minute without stopping.
2. Repeat the above with vertical head movements up and down and with a large, full-field stimulus, like a chessboard. The exercises' duration is gradually extended from 1 to 2 minutes.
3. Then you should repeat each exercise at least 3 times each day (unless you have a headache).
4. You may wish to progress the difficulty level, by practicing these while you are standing before moving onto the gaze stabilisation work while walking.
5. Other ways of progressing involve performing the exercises in various positions and activities (i.e. head movements performed in sitting, then standing).

Progression: Gaze stabilisation whilst walking.

When things have improved you are ready to move onto the following exercise.

Try walking around your sitting room at home, with your eyes open, twice to the right, and twice to the left. Choose 3 targets to focus on as you walk in each direction. Try to keep the objects in focus as you go.



Control Attacks of Breathlessness and Anxiety

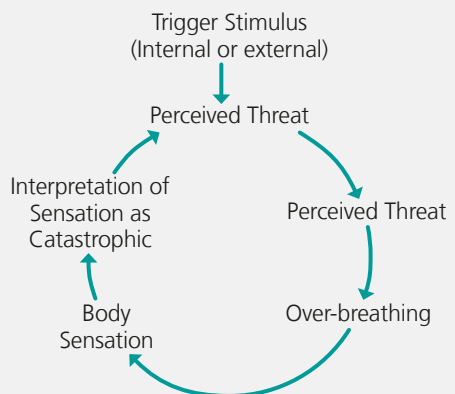
Hyperventilation syndrome (HVS) is particularly common in groups of patients complaining of dizziness of inner ear origin. In HVS the regular breathing pattern is disrupted. This may be caused perhaps by a startled intake of breath if you think you are about to fall (or other sources of breathing irregularity). This then disrupts the ratio of oxygen and carbon monoxide in the blood stream and how much blood flows to different parts of the brain and body. Depending on where the change in blood flow occurs, the symptoms can vary. Sensations can range from dizziness, tingling, breathlessness, pressure in the head, changes in tinnitus or headaches, unease/panic, tiredness and light headedness.

So although an inner ear problem may be responsible for generating the symptoms, irregular breathing patterns may slow down your natural recovery from the inner ear balance problem. The aim of the exercises is to restore the correct levels of oxygen and carbon dioxide in the blood stream so that minor changes in breathing rate no longer trigger sensations. We cannot say what proportion of your symptoms, are HVS induced sensations but we do find that people do better if they use these exercises in combination with the balance exercises.

In order to pace your breathing you should sit in front of a clock with a second hand but using a counting strategy like counting elephants enables you to estimate each second passing. To pace your breathing you need to count 3 elephants as you breathe IN and 3 elephants as you breathe OUT (1 elephant = 1 second). If you can do this for more than 2 minutes without bringing on too many of the HVS sensations already mentioned then you should be able to manage at home on your own.

If you cannot do this without bringing on sensations then we need to ask you to use this technique a little more, so that you build up over a period of two weeks to this 6 second rhythm (normal rate). Please see Section B.

If you find the 6 second rhythm is very difficult, then please start with Section A.



Section A:

Acute Hyperventilation

1. Find out by observation and timing how long you normally take to breathe in a relaxed way. If you find your natural rhythm is 3-4 seconds then start by spending 2 minutes, 10 times a day breathing at a 4 second rhythm (i.e. 2 elephants as you breathe in and 2 as you breathe out).
2. Move on to using the 4 second rhythm for 5 minutes at a time.
3. Move on to using the 4 second rhythm for 5 minutes 4 times a day.
4. Move on to using the 4 second rhythm for 10 minutes twice a day
5. Eventually you will be able to progress to the 6 second rhythm.

Only move on to the next exercise once you are comfortable with the current exercise and you manage not to bring on any sensations. You will be able to manage the 6 second rhythm eventually but it may take a little longer to get there.

Section B:

Basic Paced Breathing Exercise (6 second rhythm).

The following should be carried out 5-10 minutes twice a day.

1. First sit or lay down in as relaxed a way as you can manage and where you can be free from any distractions.
2. Then start to breathe regularly and slowly as if you were going to sleep, moving your stomach in and out, keeping the shoulders and rib cage as steady, as you can.

Section B (cont'd):

2. Then, either time your breaths using a clock with a second hand or simply count elephants (i.e. 3 elephants as you breathe in and 3 as you breathe out).
3. Try also to focus on a feeling of relaxation. Check, your face muscles and particularly your shoulder muscles, relaxing them further if necessary.

When you can manage this breathing rhythm for 5 minutes without inducing any sensation of light-headedness (or other HVS sensations) you can go on to learn Progressive Muscle Relaxation (Section C).

Section C:

Progressive Muscle Relaxation

After you have established your breathing pattern, start the following sequence: try to pause for 1 second, between each breath. On each exercise tense the muscles up on an IN breath, making the in breath last for 2 seconds while you keep your muscles tense then relax and breathe OUT slowly at the same time. Allow a short pause before going on.

1. Curl your toes hard and press your feet down
2. Now press your heels down and bend your feet up
3. Now tense your calf muscles
4. Now tense your thigh muscles, straightening your knees and making your legs stiff
5. Now make your buttocks tight

Paced Breathing Exercises

Section C (cont'd):

6. Now tense your stomach as if to receive a punch
7. Now bend your elbows and tense the muscles of your arms
8. Now hunch your shoulders and press your head back into the cushions
9. Now clench your jaws, frown and screw up your eyes really tight
10. Now tense all your muscles together

Still breathing slowly and regularly, conjure up a pleasant scene or place where you have felt relaxed. Let this image stay with you as long as you can. When you are ready, tell yourself you will be relaxed but alert, and slowly open your eyes.

Sometimes a short period of 'unwinding' by deliberately relaxing when you get in from either work or shopping can help to keep stress levels low. As time goes on you may find it helpful to use the paced breathing in situations where you know you are tense or as soon as you become lightheaded. If you worry about going out because of your symptoms, then try this before you leave.

Sources used for the information in this leaflet

- Archives of Otolaryngology, Brandt & Daroff 'Physical Therapy for Benign Paroxysmal Positional Vertigo', 1980
- NHS Evidence Clinical Knowledge Summaries, 'Benign Paroxysmal Positional Vertigo.
- Hall.C.D., Heusel-Gillig.L., Tusa.RJ., Herdman.S.J (2010) Efficacy of Gaze stability exercises in older adults with dizziness. J Neurol Phys Therapy 2010 Jun;34(2):64-9
- Herdman, S. J. (1994) Vestibular Rehabilitation. 3rd Edition. Publ F. A Davis and Co. Philadelphia
- Beyts, J. P (1997) The Rehabilitation of Balance Disorders. In Scott Browne's Otolaryngology Vol.2 6th edition, edited by S.D.G Stephens and A. Kerr. Butterworths-Heinemann, Oxford.
- Bass,C. et al (1994) 'Management of patients with hyperventilation related disorders.' In Behavioural and Psychological Approaches to Breathing Disorders edited by B. H. Timmons and R. Ley. Plenum Press.

BPPV - The Epley Manoeuvre

The Epley manoeuvre is a method of treating benign paroxysmal positional vertigo (BPPV).

What is benign paroxysmal positional vertigo (BPPV)?

BPPV is a condition of the inner ear and is a common cause of vertigo.

Benign means that it is not due to cancer or other serious cause.

Paroxysmal means 'recurring sudden episodes of symptoms'.

Positional means that the symptoms are triggered by certain positions.

Vertigo is dizziness with a spinning sensation.

BPPV causes short episodes of vertigo (intense dizziness) when you move your head in certain directions. It is thought to be caused by tiny fragments of debris in the inner ear labyrinth.

What can be done to help BPPV?

A repositioning manoeuvre can be done to move the debris back into position. This treatment uses gravity to move the debris away from where it is causing problems.

The exercise must be done on the side in which the symptoms are occurring; this should be determined by the audiologist/ENT specialist.

During the manoeuvre you are likely to feel a sensation of vertigo. This is quite normal and will pass within a few seconds. You may find it helpful to have a friend or family member present.



The manoeuvre starts sitting upright.



First, turn your head 45 degrees to the symptomatic side and then briskly lie down onto your back. This picture illustrates a treatment of the right side. Your head will need to be kept in this position for 30 to 60 seconds. You will probably be dizzy for the first 10 seconds.

The Epley Manoeuvre



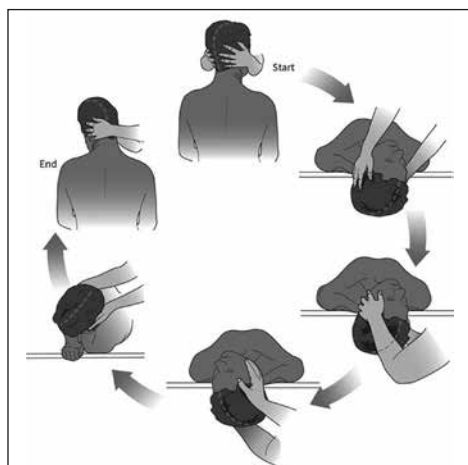
Next, turn your head to the other side, and keep it in that position for another 30 to 60 seconds. You may feel dizzy again.



Roll in the same direction onto your side, carrying your head along so that it is pointed about 45 degrees, nose down. This position is also maintained for 30 seconds, and another burst of dizziness may occur.



Finally, return to sitting. It is common to be very dizzy at this point for about 15 seconds. Remain with the head tilted a bit down (as shown) for one minute. Then, the entire manoeuvre is repeated for two more repetitions.



The recurrence rate for Benign Paroxysmal Positional Vertigo (BPPV) after these manoeuvres is about 30 percent in the first year, and in some instances a second treatment may be necessary.

Ankle and Hip Exercises

The ankle strategy exercises are designed to help you to speed up some involuntary reflexes linking your ankle to the knee to the hip, and ultimately the brain (and back down again). These reflexes are used in stabilising the body while walking or while standing on wobbly paving stones, escalators, etc. These ankle exercises are usually helpful, because most people tend to rely on their eyes to balance more during the initial recovery period following an episode of unsteadiness or a vertigo attack. These exercises help the brain to begin to integrate the reflexes, and muscle information, in a safe way.

Section A: Practice the alphabet

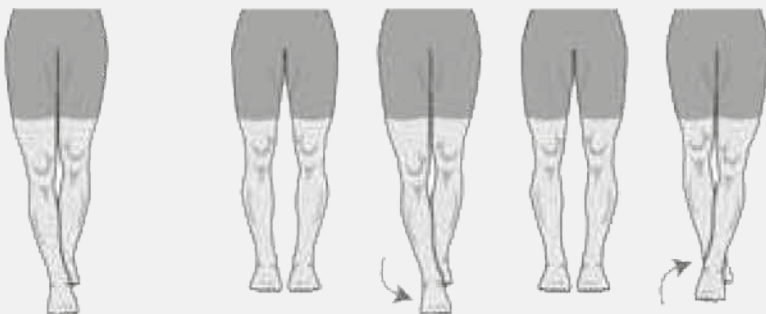
1. Stand near a wall or heavy piece of furniture in case you need to hold on for support.
2. Trace the first ten letters of the alphabet on the floor with your foot.

3. Repeat with your other foot.
4. As you get better try and trace the entire alphabet.
5. Do this times times a day.
6. Do this with your eyes: open at first, then with your eyes closed.

You can move onto the next stage (i.e. 20 letters) when you have achieved some habituation.

Section B: Stepping forward and back, crossing over

1. Stand near a wall, or heavy piece of furniture, in case you need to hold on.
2. Cross one foot in front of the other.
3. Bring it back to the starting position.
4. Cross the same foot behind the other foot.
5. Bring it back to the starting position.
6. Repeat the above sequence using the opposite foot.
7. Do this times times a day.



Otolith Desensitisation

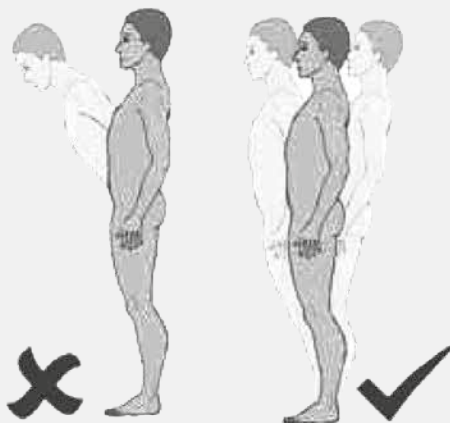
Some patients find it difficult walking on soft carpets, wobbly paving stones, cobblestones, or using escalators. The brain may need to be reminded how to attend to these reflexes in situations where there are surface challenges.

Otolith desensitisation exercises are designed to help you to learn to speed up these reflexes and cope better with surface challenges. The exercises progress to closing your eyes and this effectively encourages your brain to rely on the inner ear information more than it usually does. You may initially experience stronger sensations. If this brings on nausea stop and rest.

1. Stare at a visual target placed on the wall in front of you, and rock gently backwards and forwards. Hold onto a steady piece of furniture at first and start with 30 seconds only. When you have made progress with that, go onto doing it for 1 minute. Later progress to 2 minutes.
2. Repeat this sequence with your eyes closed. Move onto the next stage when the induced dizziness or light-headedness lasts only 2 minutes. Remember to use a support at first, so you can hold onto something while you relearn to sway safely.

3. Try fixating on a target while standing on soft surface (e.g. a foam cushion). Rock forwards and backwards, starting with 30 seconds and hold onto a sideboard or counter to support you. Progress gradually through until you can do this for 2-4 minutes without inducing dizziness. Once you have achieved this move on and repeat the exercise with your eyes closed.

You may need to work on an exercise for a while before noticing a big reduction in how off balance you feel at the end. It is a good idea to sit down once you finish so you feel safer, while waiting for the sensation to pass.



Exercise Diary

Use the following table to keep track of your exercises.

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For a further appointment, or advice about the exercises, please contact Heather Day-Lascelles, Natalie Wakefield on Tel: 01623 622515 Ext: 3036/6171/3341

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Further sources of information
NHS Choices: **www.nhs.uk/conditions**
Our website: **www.sfh-tr.nhs.uk**

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**The British Society of Audiology -
Balance Interest Group**

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The Ménière's Society

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