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MS Essentials

For people living with MS

Balance and MS

Balance problems are common in multiple sclerosis (MS), but the causes and effects can vary from person to person and from one day to another. Problems can include 'vertigo' – a feeling of dizziness where the world appears to be spinning, though not everyone experiences this. For some people, balance problems mean they are wobbly on their feet from time to time, or they find they need to move with more care than before to avoid losing balance.

Finding the best way to manage any balance problems will be an individual thing – there is no single solution for everyone. But many people do find effective ways to improve their balance and feel more confident about getting about.

Keeping the body balanced involves many messages going to and from the brain. Even standing still, the body is constantly adjusting to the environment and making tiny changes. When MS causes damage to the brain or spinal cord, this can distort messages and cause balance problems. However, there can be other causes, quite separate from MS, and balance problems are common in the general population too.

A whole range of health and social care professionals can help, including physiotherapists, occupational therapists, rehabilitation specialists, MS specialist nurses and ear, nose and throat specialists.

This booklet looks at how the body's balance system works, how it might be disrupted, and helpful ways to manage the issue.

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Balance difficulties in everyday life

People with MS can experience balance problems in different ways. For some, feeling unsteady is a brief, passing sensation, for others it may be a more lasting issue that affects getting about day to day. It may affect how you get around on foot, or by car, and moving from one position to another. Stationary activities such as reading, watching a film or television can also be disrupted.

Apprehension and anxiety

Balance usually happens without us thinking about it, and if this changes, even temporarily, it can take some getting used to. It is not unusual to feel a sense of apprehension about walking in unfamiliar places when balance is difficult, particularly if it is a new or changing symptom. Vertigo and other balance difficulties can understandably cause a certain amount of anxiety. Anxiety, in turn, may make balance more difficult, so it is important that the emotional side of symptoms are not ignored.¹ Anyone can experience anxiety, and if you do, it may not be directly because of MS, but whatever the causes, there are treatments and ways to manage it. Speak to your MS nurse, doctor or other health care professional if you think you notice changes in your mood or are often feeling anxious or depressed.

Explaining to others

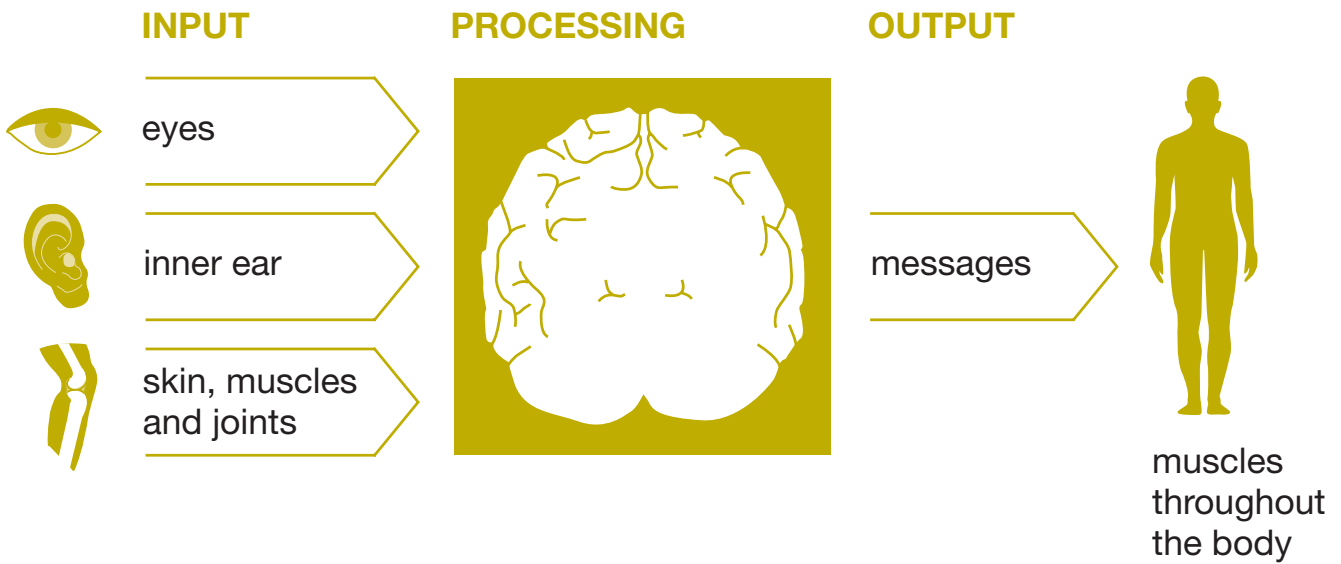
Balance problems might sometimes have more of an impact because of other people's misunderstandings. It is not uncommon for people with MS to find themselves explaining that they are not drunk, just wobbly on their feet sometimes – especially if this is the only symptom people around them can see. The MS Society has produced a credit-card sized Assistance card to help explain this possible symptom of MS (see 'Further information' on page 13).

Staying safe

As well as affecting everyday mobility, balance problems can increase the risk of falling, perhaps with painful consequences.² Finding ways to manage the problem can minimise this risk. You may find you need to pay more attention than usual to balancing when you walk and move around – something you have usually been doing without thinking. The expression 'can't walk and chew gum' might accurately describe the situation – you may find you can balance better when you focus only on walking, without doing anything else at the same time.³ You might decide to try using a stick sometimes, for balance. The important thing is to find the best solution for you.

How does balance work?

Good balance needs many different parts of the body to work together effectively. It might be helpful to think of these different parts of balance being grouped into **input**, **processing**, and **output**.



Input

There are three main input systems working to keep the body balanced, constantly feeding information to the brain through nerve fibres.

The three systems are:



- **The eyes – the ‘visual system’.** The eyes provide information about where the body is, the direction it is pointing in, what direction it is moving and whether the body is turning or is standing still.



- **Part of the inner ear and its connections to the brain – the ‘vestibular system’.** The inner ear is deep into the ear, beyond the ear drum, and it has two important roles. One is to process sounds that we hear. The other is to measure movement of the head, rather like a complicated version of spirit levels used in DIY. (One of the main parts of this system in the inner ear is called the ‘vestibule’, which is where the ‘vestibular system’ gets its name.)



- **Sensors in joints, muscles and skin – the ‘proprioceptive system’.** All over the body there are sensors providing information on motion, position and pressure. For example, messages from the skin on the soles of the feet help the brain to balance the body when standing up: too much pressure on the front of the foot is a signal the body is falling forwards; too much pressure on the heel signals that the body is tilting backwards.

Processing



The brain processes the information it receives, making sense of all the input messages, to work out where the body is and how it is moving. There is no single part of the brain responsible for this processing, but areas called the ‘cerebellum’ and the ‘brainstem’ play a major role in balance, including helping to control the body’s overall coordination.⁴

Output



Having processed the information it receives, the brain sends out messages – back along nerve fibres, through the spinal cord and out to the muscles. These outputs adjust to the movement and position of the body in its changing surroundings, keeping the body balanced.

How can MS affect balance?

MS can affect any part of the central nervous system (the brain and spinal cord), damaging the protective layer around nerve fibres (called 'myelin'), or the fibres themselves. This can mean messages get delayed, disrupted or stopped altogether.

Messages going to the brain (input messages) and messages leaving the brain (output messages) can both be affected, so the information the brain receives and the replies it sends back out can be late, incomplete or misleading. MS damage can also disrupt the messages being passed inside the brain, affecting how the brain processes balance information.

Some symptoms of MS can also have a knock-on effect on balance. For example, tremor or muscle spasms can mean that an output message is disrupted: the brain processes the information correctly, but the muscle does not respond in the way it was intended. If balance is being affected by other symptoms, such as tremor, you may notice that your balance also gets better and worse as these other symptoms come and go.

MS may affect the balance inputs:

Vision – Not everyone with MS has problems with their eyes, but visual disturbances are a relatively common symptom in MS. Temporary double vision (or 'diplopia'), for example, affects probably around a third of all people with MS at some time or other.⁵ Other disturbances can include blurring, or flashes of colours or light. Sometimes, stationary objects can appear to flicker or jump about.

These kind of changes can give confusing information to the brain when it tries to work out how the body is moving relative to the world around it. On their own, visual problems are not usually enough to upset someone's balance, but together with other input messages, they may have an impact.³

Obvious visual problems are often only temporary, during an attack of optic neuritis, for example, or sometimes during or shortly after exercise. More subtle changes may last longer which, even if they are not a problem in themselves, might affect balance through the misleading messages they send to the brain.³

Sensory changes – Another common symptom with MS is changes in sensation, such as numbness or tingling, which can come and go and change over time.

These symptoms appear when MS damage in the brain or spinal cord delays, distorts or completely stops information coming from sensors in the skin, muscles or joints. As well as causing these unusual sensations, the brain may not be receiving the accurate information it needs for proper balance.

The inner ear – The inner ear constantly updates the brain about the angle and position of the head. If MS damages the message pathways from the inner ear area, confusing or missing signals can add to balance problems. If you experience ‘vertigo’ – spinning or falling sensations – this can be a sign that messages from the inner ear are involved.⁴

MS may affect the processing:

The brain can compensate for a certain amount of damage in different parts of the balance system. Even if input messages are disrupted there may be no obvious signs of balance problems. But if damage is more widespread, the effects can become noticeable, as the brain’s limits of compensation are reached.

The brain also appears to be better at dealing with missing information than with incorrect or misleading information.³ If MS distorts or delays input messages, the brain still responds as if the information is accurate. By responding to inaccurate information, the brain’s response can actually make balance worse, rather than better.

MS can also disrupt the messages going to and fro inside the brain. Almost every part of the brain is involved in balance in some way or another, but one area particularly associated with the process is the ‘cerebellum’. If MS causes damage to this area, the brain may be less able to compensate for missing or incorrect messages, or may send out misleading responses to the muscles as the body tries to balance.³

MS damage to the cerebellum or to the ‘brainstem’ (at the back of the brain, where it joins the spinal cord) may also cause vertigo, sometimes accompanied by nausea. But vertigo and nausea can also be caused by changes in the inner ear, so it should not be assumed that MS is the cause.⁴

MS may affect the outputs:

MS can cause a wide range of symptoms that may also have an effect on balance, such as difficulties with coordination, tremor, muscle weakness, stiffness or spasms. MS varies greatly from person to person and not everyone experiences these symptoms, but as with visual and sensory changes, even small effects that are barely noticeable may have an impact on balance.

To react to changes in the body's position, the brain needs to constantly instruct muscles to make tiny (and sometimes larger) adjustments. A weak or stiff muscle might not move to the desired position, or might get there too slowly. If this combines with misleading information about where the muscle is balance can be harder.³

Other causes of balance difficulties

Balance difficulties are also common in people who do not have MS and if you do have MS, that might not always be the cause. It is important to have any symptoms properly investigated and not to assume that everything is down to MS.

For example, infections in the inner ear can upset the body's balance, often accompanied by vertigo and sometimes vomiting. Drug treatments may help in the early days of an infection like this. Sometimes, feelings of vertigo come back from time to time in the weeks after the first problems have gone away and a physiotherapist or ear, nose and throat (ENT) specialist may show you physical exercises that can help manage these occasional episodes (exercises with names such as the Epley or Semont manoeuvres).

Your doctor or a physiotherapist might also teach you movements that can help if you experience vertigo caused by 'benign paroxysmal positional vertigo', or BPPV. This causes a short-lived ('paroxysmal') spinning feeling, normally lasting for one or two minutes, or less, usually brought on by particular head movements. BPPV is caused by tiny particles trapped in the inner ear. Movements such as the 'Brandt-Daroff exercises' can help to remove these particles. Just like vertigo caused by MS, it can be accompanied by nausea. Some people find short-term relief from nausea and vertigo with drugs such as prochlorperazine or betahistine.

Because these causes of inner-ear problems can happen to anyone, they should not be ruled out as a cause of balance problems, even if you have MS.

The Brain and Spine Foundation produces a free publication which looks at the more common causes of balance problems, including BPPV and inner-ear infections. To order *Dizziness and balance problems. A guide for patients and carers*, visit www.brainandspine.org.uk or call 0808 808 1000.

Side effects of drug treatments

Some drug treatments can have side effects involving balance. For example, treatments for muscle spasms and stiffness, and for some sorts of pain, can make people feel dizzy or disorientated. Medications that relax muscles, such as baclofen or gabapentin, can cause temporary weakness in the muscles which could make balancing more difficult. As with all treatments, it can be a case of weighing the benefits against side effects and finding the best compromise. Over time, you and your doctor or MS nurse might make many adjustments to the drugs you use or the dose you take, to find the best for you.

What can I do to improve my balance?

Unfortunately, there is no single treatment for 'MS balance problems'. Suitable therapies and drugs will depend on the individual and the causes of the balance problem. Because there are so many different possible causes for balance difficulties it is important that the issue is investigated properly. There may be a combination of causes and these may not all be directly due to MS, so treating one factor alone might not bring about the best results. Treatments for other symptoms, such as muscle stiffness or weakness, fatigue, pain or anxiety might also have benefits for your balance.

There may be more than one health or social care professional involved. For example, an MS nurse, physiotherapist or occupational therapist, can all help find the probable causes and the most appropriate way to manage the issue. And they may refer you to an ear, nose and throat (ENT) specialist, or to a specialist rehabilitation team.

A health care professional can help you set achievable, practical goals for improving and managing your balance, so that you can see the benefits, or adjust the plan accordingly. You may notice improvements only very gradually – managing balance problems is a long-term project, but one which can have results.

Treating relapses

Your balance might get worse during a relapse (an attack of symptoms that lasts for more than 24 hours). Steroid treatment, either by injection or tablets, can speed up recovery from the symptoms of a relapse. Your balance might also be affected if your body temperature rises because of an infection – this is sometimes known as a ‘pseudo-relapse’ because it has the appearance of a relapse but has a different cause. It is important that infection is ruled out as a cause of any attack of symptoms. Steroid treatment is not used to treat pseudo-relapses.

Balance assessment

Identifying the causes of balance problems can help find the best solutions. Regular assessments by a physiotherapist or other health care professional can help monitor your progress and highlight improvements. They can also reveal adjustments that could be made if your circumstances, or the causes of balance difficulties, change.

They may ask you about the details of how, where and when it affects you. For example, if you have more trouble balancing when out in the open and whether you experience vertigo at the same time. This can help reveal if the inner ear and the ‘proprioceptive’ (sensory) inputs are likely to be involved.

A health professional may ask you to stand still and upright with your eyes open, then closed. Judging how your body moves and sways can give clues about how far your vision might be involved in balance problems. They may also check your vision for any unusual eye movement which could have an effect on balance.

Another balance test looks at the ‘vestibular’ system (the involvement of the inner ear and its messages). This painless test sends a clicking sound to one ear at a time. Electrical sensors placed on the skin record responses in the central nervous system. If signals are weaker than expected, or do not get through at all, it indicates that messages from the inner ear may be involved in balance problems.

An assessment may also highlight other symptoms that could be treated or managed differently to improve balance, such as muscle stiffness, tremor, weakness or fatigue. It can also show where physiotherapy might help, or reveal any necessary adjustments to physiotherapy you already do. Drug treatments you take or any equipment you use can also be looked at and adjusted if necessary.

Compensation and balance retraining

The brain will naturally and automatically compensate for a certain amount of damage to the signals it receives for balance, but there can be things people learn to help compensate for changes – sometimes called ‘balance retraining’. Some people find that working with a physiotherapist or rehabilitation specialist helps them to challenge their current levels of balance and improve their body’s ability to compensate. This is not a quick solution, but over time it can be beneficial.

For example, a physiotherapist may pick up certain movements when you walk that are affecting your balance. A relatively common issue for people with MS balance problems is landing on the front of the foot instead of the heel when stepping forwards. This could be caused by changes in sensation or a weakness in certain muscles. The result is that the body tips forward when walking, throwing the body off balance. By improving both muscle strength and awareness of the way they step, people can compensate for the muscle weakness or change in sensation that caused the problem. With practice, these new techniques become automatic.

Exercise and exercise equipment

Having assessed what the most likely causes of imbalance are, a physiotherapist might suggest specific exercises to manage the problem. A carefully designed physiotherapy programme can help improve balance.⁶ There could be a range of different exercises that are useful, including exercises specifically to improve balance.⁷ Physiotherapy might also improve your posture, and the strength and suppleness of your muscles,⁸ which in turn could benefit your balance.

Sometimes, a therapist may suggest using equipment such as a balance board, a Swiss ball (sometimes called a yoga ball) or a ‘whole-body vibration’ platform, which some people say help them to balance better.⁹

Before trying any new exercise, or new piece of equipment, consult a health care professional to be sure it is safe and will not cause more problems than it solves. If you attend group sessions, it is worth considering whether the teacher has experience of people with MS, or knowledge of the condition. You may want to discuss how MS affects you and if there are aspects of the activity that might be adjusted to suit you better. Remember, what suits one person may not be ideal for someone else. Remember

also that trying anything might feel difficult at first when your balance is not at its best. But challenging your balance, safely and gradually, can be a way to develop it. Finding the right exercises, at the right level for you, can make a real difference to how you feel.

Yoga, Pilates, t'ai chi and the Alexander technique are all forms of exercise therapy that people with MS say help them with their balance.¹⁰ Clinical trials have found some benefits from t'ai chi, including improved walking speed.¹¹ Outdoor walking and aerobics may also help with balance.⁶ One very small study in 2007 suggested that some people with MS may see improvements in their balance through hippotherapy – a form of physiotherapy using horse-riding.¹² As with anything else, seek the advice of a health care professional if you are considering it.

The MS Society publications *Exercise and physiotherapy* and *Complementary and alternative medicine* have further information about finding activities that are safe, effective and suit your needs.

Aids, equipment and adaptations

Because problems with balance can vary from time to time and place to place, the best tool for the job may also vary. You might find a range of equipment useful.

You may find it helpful to use a stick at times. Some people find it particularly helpful in open spaces, or in unfamiliar places. Folding sticks are widely available from high street chemists and specialist equipment suppliers. Folding it away into a small bag can be handy, especially if you use it only in certain situations.

Some people also find wheeled walking frames useful – often known simply as a 'walker'. These can give not only a point of contact for balance, but also a support if you get tired. They come in a range of sizes, often with brakes for the wheels, a seat if you need to rest and a place to carry bags.

Your occupational therapist and the Disabled Living Foundation can give you further details about equipment available (see page 14 for contact details). An occupational therapist can also help you find suitable adjustments or adaptations. To arrange for an assessment of your home, contact your local authority social services department or ask for a referral from your health care team.

Some people find that simply arranging the furniture differently provides a series of ‘balance points’ around the home, which helps them get around. Small adaptations to the home may be helpful. For example, hand rails along a garden path or at the entrance to the house, or a second banister on stairs. The MS Society publication *Adaptations and your home* has further information about choosing and paying for adaptations.

If you are employed, there may also be useful changes that you and your workplace can make. Employers have a legal duty to make ‘reasonable adjustments’ to help you do your job. The MS Society publication *Working with MS* has further details, for both employers and employees.

Auditory and visual feedback

Research is going on in a number of places in the world into using technology to help people with their balance. ‘Auditory feedback’ uses clicking sounds fed through headphones that respond to the type of footsteps the person takes (the sound changes according to the style of footstep taken). This feedback of information to the brain appears to help it control the body’s balance for some people with MS.¹³

Visual feedback can make use of ‘virtual reality’ technology – providing feedback to the brain through goggles that show an artificial floor surface. This stylised image of a surface to walk on helps some people with MS to improve their walking, giving them more confidence and awareness. These effects may continue for some time after using the goggles, as people remember the image of the ‘virtual floor’ when they walk.¹⁴

These are both techniques in the early days of development and research, but are adding to researchers’ understanding of balance and coordination difficulties and how they can be managed effectively.

Further information

MS Society publications

The MS Society has publications on a wide variety of topics, including information for people just diagnosed, types of MS, managing relapses, and social services. For a publications list and order form visit the website www.mssociety.org.uk or call 020 8438 0799 (Monday to Friday, 10am-3pm).

MS Society website and magazine

Keep up to date with news relating to MS with the MS Society website www.mssociety.org.uk and members' magazine, *MS Matters*. Details about *MS Matters* are on the web and in the Society's publications list.

MS Helpline

The award winning freephone MS Helpline offers information and support to anyone with MS, their families, friends and carers. Trained Helpline staff can answer questions about MS and related personal issues. All calls are treated in complete confidence. Information about MS is available in 150 different languages by speaking to a Helpline worker via an interpreter. Freephone 0808 800 8000 (Monday to Friday, 9am-9pm).

MS Society National Centre, Information Centre

Based at the MS National Centre in London, the Information Centre is equipped for visitors to read or locate books and journals or view videos and DVDs. The Information Centre also runs an information line: 020 8438 0799, Monday to Friday, 10am-3pm, which you can call to request publications, research articles or other information about MS.

Local information centres

There are MS Society local information and support centres in many locations around the country. These centres are staffed by volunteers who can help you with information about MS and services in your area. Call 020 8438 0799 for the details of your nearest centre.

Local branches

The MS Society has a network of some 340 local branches across the UK. The branches – run by trained volunteers – provide information about MS and local services, a chance to meet others affected by MS and take part in a range of activities. For more information check the MS Society website or call 020 8438 0759.

Useful organisations

Chartered Society of Physiotherapy

The professional body for physiotherapists in the UK. They can provide details of registered physiotherapists who specialise in neurological conditions such as MS.

14 Bedford Row
London WC1R 4ED
Telephone 020 7306 6666
www.csp.org.uk

Multiple Sclerosis National Therapy Centres

A federation of therapy centres around the UK. They offer a variety of therapies. Some centres offer physiotherapy clinics.

PO Box 126
Whitchurch SY14 7WL
Telephone 0845 367 0977
www.ms-selfhelp.org

Disabled Living Foundation (DLF)

Provides information and advice on equipment to enhance independence.

380-384 Harrow Road
London W9 2HU
Helpline 0845 130 9177 (Monday to Friday, 10am-4pm)
Textphone 020 7432 8009
www.dlf.org.uk

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Disclaimer: We have made every effort to ensure that the information in this publication is correct. We do not accept liability for any errors or omissions. The law and government regulations may change. Be sure to seek local advice from the sources listed.

Suggestions for improvement in future editions are welcomed. Please send them to infoteam@mssociety.org.uk.

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Multiple Sclerosis Society

Multiple sclerosis (MS) is the most common disabling neurological disorder among young adults and around 85,000 people in the UK have MS. MS is the result of damage to myelin – a protective sheath surrounding nerve fibres of the central nervous system. When myelin is damaged, this interferes with messages between the brain and other parts of the body.

For some people, MS is characterised by periods of relapse and remission while for others it has a progressive pattern. For everyone, it makes life unpredictable.

The MS Society is the UK's largest charity dedicated to supporting everyone whose life is touched by MS. It provides respite care, a freephone MS Helpline, grants for home adaptations and mobility aids, education and training, MS specialist nurses and a wide range of information. Local branches cater for people of all ages and interests and are run by people with direct experience of MS. The MS Society also funds over 40 vital MS research projects in the UK.

You can help the work of the MS Society by:

- becoming a member
- making a donation
- offering your time as a volunteer

Contact information

MS National Centre
372 Edgware Road
London NW2 6ND
Telephone 020 8438 0700

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Ratho Park
88 Glasgow Road
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Newbridge EH28 8PP
Telephone 0131 335 4050

MS Society, Wales
Temple Court
Cathedral Road
Cardiff CF11 9HA
Telephone 029 2078 6676

MS Society, Northern Ireland
The Resource Centre
34 Annadale Avenue
Belfast BT7 3JJ
Telephone 028 9080 2802

National MS Helpline
Freephone 0808 800 8000
(Monday to Friday, 9am-9pm)

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Registered charity 207495