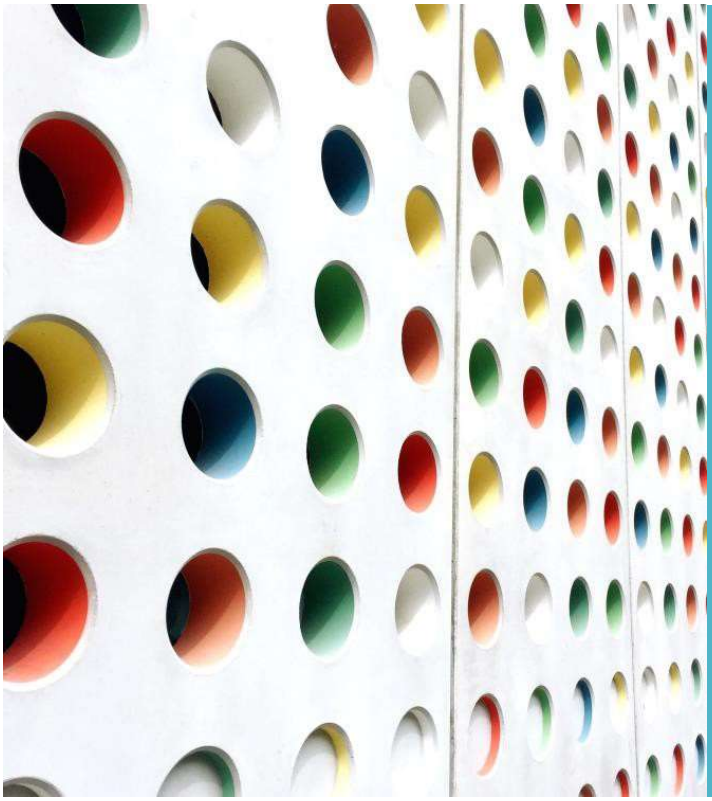


Multiple Sclerosis management in nursing homes

DR NORA S VYAS
ASSOCIATE PROFESSOR

1

Learning Outcomes

- Increase awareness of early signs and symptoms of multiple sclerosis
- Recognise the symptoms indicating a worsening of the condition
- Identify appropriate resources available to support management strategies

2

Multiple Sclerosis: Clinical presentation

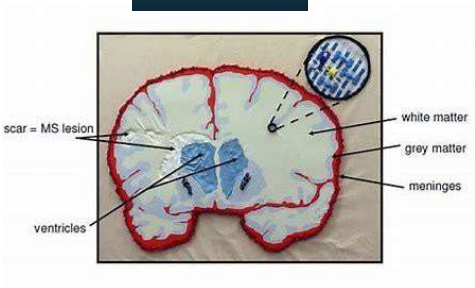
- Progressive neurogenerative disease affecting the brain and spinal cord.
- Inflammatory, autoimmune disease of the central nervous system
- Characterised by relapsing neurologic symptoms, and progressive impairment in function.

- Immensely variable symptoms and signs including: monocular vision loss, brainstem (cranial nerve deficits), motor/sensory impairments, imbalance

3

Historical concepts of MS: Jean-Martin Charcot

- A female patient suffered an unusual combination of symptoms.
- He tried some of the typical treatments for other neurological disorders, but none of them worked.
- After his patient died, he dissected her brain and discovered the brain lesions. He called the disease *sclerose en plaques*.
- Charcot's original triad: "intention tremor, nystagmus, scanning speech"
  - Modern era – this would be end-stage, progressive MS.



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Epidemiology of multiple sclerosis

- Highly disabling disorder with considerable personal, social and economic consequences.
- Affects approximately 130,000 people in the UK
- Common cause of serious physical disability in adults of working age
- High burden of disease and comorbidity
- Age of onset: typically late 20s to 40.
  - About 0.5% of adults with MS first develop symptoms aged 60 years + - older age at onset is associated with *progressive course*.
  - Experiencing visual and sensory disturbances, limb weakness, gait problems, and bladder and bowel symptoms
    - May initially have partial recovery, but over time develop progressive disability
- Gender risk ratio, women outnumber men 2.5-3:1
- More common among those of Northern European descent, but can affect anyone
- Latitudinal effect: increased prevalence with northern exposure.

5

Early signs and symptoms of MS

The most common initial presentations are:

- Optic neuritis (20-30% of people with MS)
- Transverse myelitis – focal inflammation within the spinal cord
- Cerebellar-related symptoms
  - Vertigo, clumsiness, dysmetria (assessed by finger-to-nose testing and walking heel to toe)
- Brainstem syndromes
  - Ataxia, eye movement abnormalities , bulbar muscle problems resulting in dysarthria or dysphagia.

Do not routinely suspect MS if:

> The person's main symptoms are fatigue, depression or dizziness unless there is a history of neurological symptoms or signs.

6

Multiple sclerosis: Disease onset

Common features include:

- Motor weakness, parethesias, impaired vision, double vision, intention tremor, ataxia.
- The diagnosis may be uncertain at the onset when symptoms point to a lesion in only one location. Later, as the disease recurs and disseminates, the picture becomes much clearer.
- The ability of MRI to show clinically silent lesions has greatly added in establishing the diagnosis in the disease's early phase.

7

Multiple sclerosis: Disease onset

Clinical Hallmarks:

- Symptoms of MS relapse / attack emerge over days, last for days to weeks
- Referable to optic nerve (optic neuritis), brainstem (diplopia, vertigo), cerebellar (ataxia, imbalance), spinal cord (hemisensory, paraparesis)
- Typically "localizable" to CNS damage
  - Not typically nebulous (i.e. not merely fatigue, cognitive fog, vague dizziness, diffuse pain)

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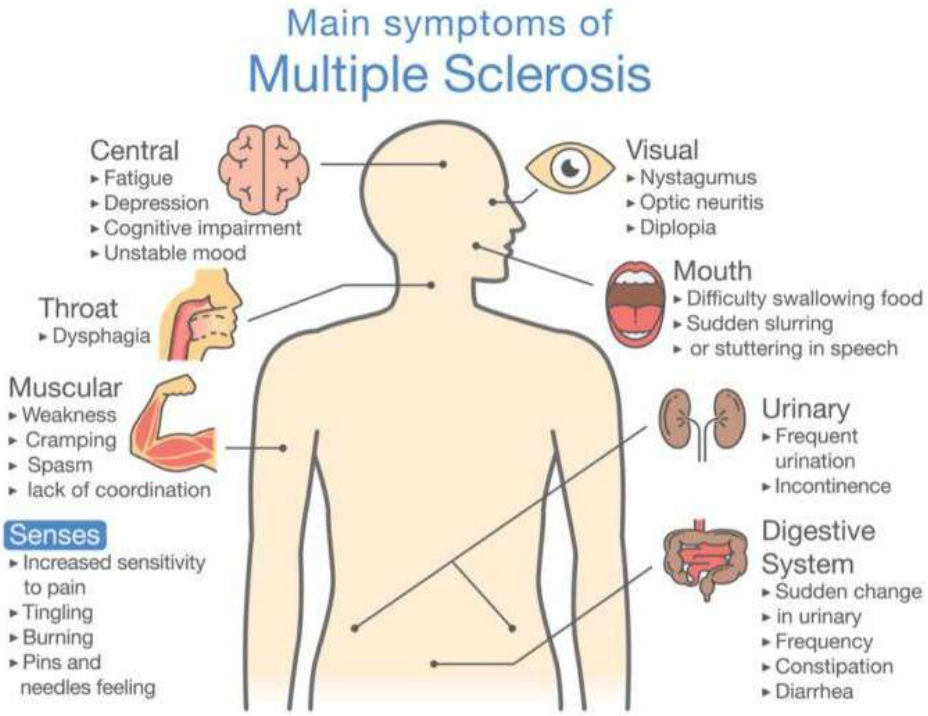

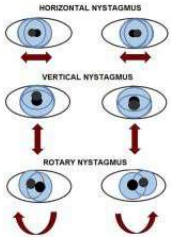

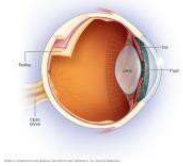

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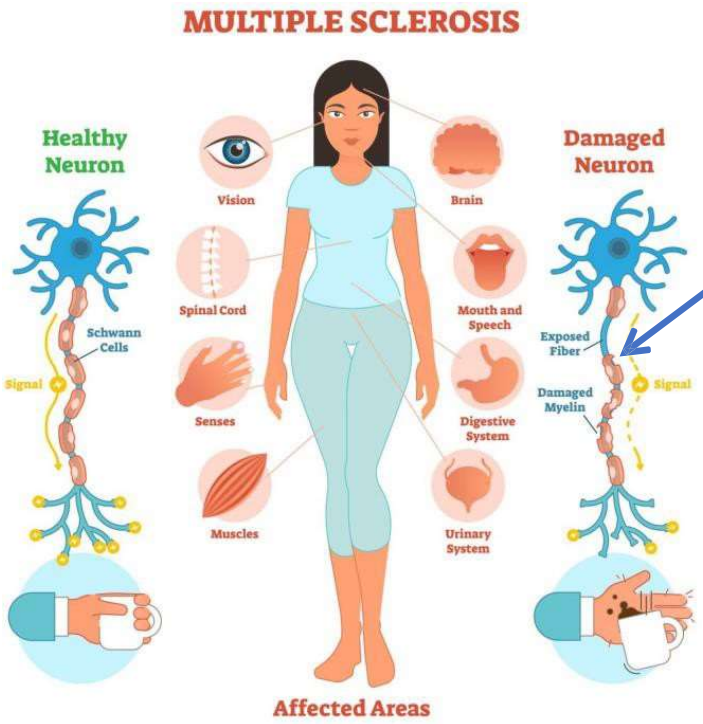

People with MS have an immune system which attacks the myelin sheath which leads to lost/poor communication between the brain and the rest of the body

8

Types of MS

There are three main types (or presentations) of MS:

Relapsing remitting

Secondary progressive

Primary progressive

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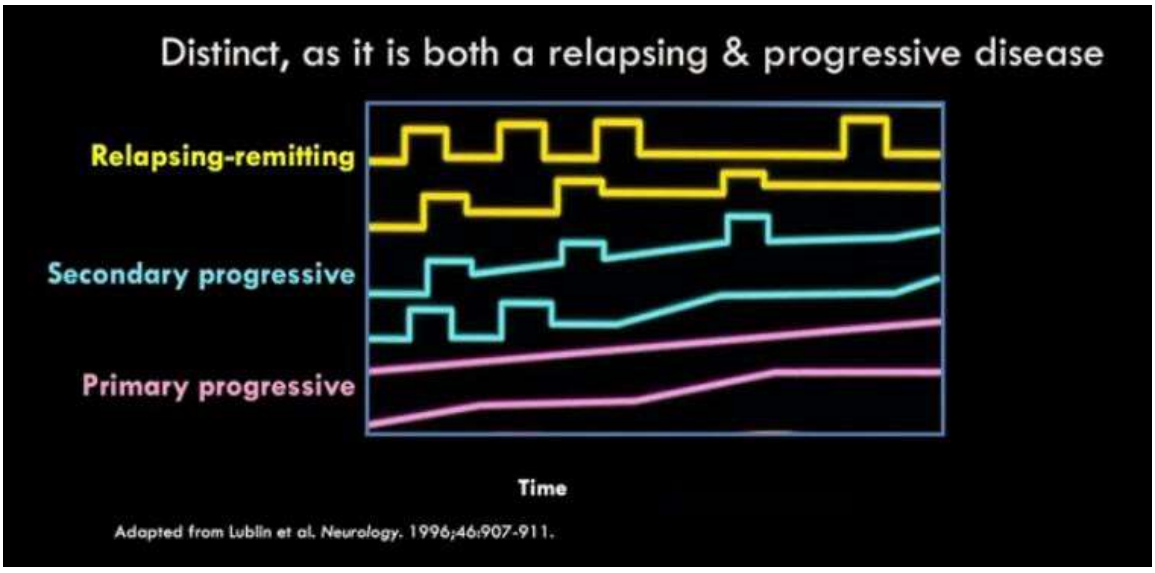
Clinical course and phenotypes



12

Causes of MS: Genetic risk

- Believed that an abnormal immune response to environmental triggers in people who are genetically predisposed results in immune-mediated acute, and then chronic, inflammation.
- Initial phase of inflammation is followed by a phase of progressive degeneration of the affected cells in the nervous system

- MS is partially heritable disease (1 in 1,000 / 1 in 4)
  - Meta-analysis of twins reported that genetic variation may be responsible for about half of the individual differences in susceptibility to MS (Fagnani et al. (2015); further confirmation from a national study (Westerlind et al., 2014).

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Identification of genes in MS

- Over 200 genetic risk variants, all single nucleotide polymorphisms (SNPs), have been identified.
- The SNPs are located within, or close to, genes expressed predominantly in acquired or innate immune cell subsets --- contribute to MS pathogenesis.
- The largest and first identified genetic risk factor is an allele from the MHC class II HLA-DRB1 gene, **HLA-DRB1*15:01**, which increases risk to about three-fold.

  - Mosca et al. (2017): reported clinical and genetic features of multigenerational Italian MS family (6 individuals with MS).
    - They reported the presence of the DRB1*15:01 allele in all the MS cases and in 4/5 non-affected subjects.
    - They confirmed the link between HLA-DRB1*15:01 and MS disease in the family.
    - Importantly: its presence in non-affected subjects suggests involvement of other susceptibility factors

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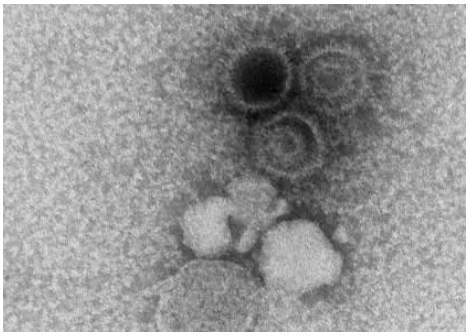
Causes of MS: Environment risks

- Smoking (Briggs et al., 2014)
- Obesity
- Female sex hormones
- Infection with Epstein-Barr virus (EBV)
  - If manifested as infectious mononucleosis, significant association with risk of MS (Belbasis et al., 2015)



An electron microscopy image showing three Epstein-Barr virus particles.

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Causes of MS: Environment risks (cont.)

- MS risk is greater in high latitudes (away from the equator), although this is attributed to low ultraviolent light, which affects the production of vitamin D.

Multiple sclerosis
Research paper

Higher latitude is significantly associated with an earlier age of disease onset in multiple sclerosis

Chunrong Tao [1], Steve Simpson Jr [1], Ingrid van der Mei [1], Leigh Blizzard [1], Eva Havrdova [2], Dana Horakova [3], Vahid Shaygannejad [4], Alessandra Lugaresi [5, 6], Guillermo Izquierdo [7], Maria Trojano [8],

Background Age at onset (AAO) in multiple sclerosis (MS) is an important marker of disease severity and may have prognostic significance. Understanding what factors can influence AAO may shed light on the aetiology of this complex disease, and have applications in the diagnostic process.

Methods The study cohort of 22 162 eligible patients from 21 countries was extracted from the MSBase registry. Only patients with MS aged ≥16 years were included. To reduce heterogeneity, only centres of largely European descent were included for analysis. AAO was defined as the year of the first symptom suggestive of inflammatory central nervous system demyelination. Predictors of AAO were evaluated by linear regression.

Results Compared with those living in lower latitudes (19.0–39.9°), onset of symptoms was 1.9 years earlier for those at higher latitudes (50.0–56.0°) ($p=3.83\times10^{-23}$). A reciprocal relationship was seen for ambient ultraviolet radiation (UVR), with a significantly increasing AAO for patients with MS per each quartile increment of ambient UVR ($p=1.56\times10^{-17}$). We found that the AAO of female patients was ~5 months earlier than male patients (p=0.002). AAO of progressive-onset patients with MS were ~9 years later than relapsing-onset patients ($p=1.40\times10^{-265}$).

Conclusions An earlier AAO in higher latitude regions was found in this worldwide European-descent cohort and correlated inversely with variation in latitudinal UVR. These results suggest that environmental factors which act at the population level may significantly influence disease severity characteristics in genetically susceptible populations.

http://dx.doi.org/10.1136/jnnp-2016-314013

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Impact of MS on daily life

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Activities of daily living impacting patients with MS

50% reported limitations in daily life due to:

- Fatigue
- Physical weakness
- Problems with balance/coordination
- Heat/cold sensitivity
- Memory problems
- Trouble concentrating
- Impaired movement / muscle stiffness
- Sleep disturbances

Bass et al., 2020

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Referral and diagnosis

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Referral and diagnosis

- Refer people suspected of having MS for diagnosis by a consultant neurologist or a specialist under their supervision.
- **Diagnosis of MS**: history, examination, MRI and laboratory findings, and by following the **2017 revised McDonald criteria**. This should include:

- assessing that symptoms are consistent with an inflammatory demyelinating process; for example, headache is not suggestive of MS
- excluding alternative diagnoses (targeted laboratory tests may be indicated if the history, examination or MRI findings are atypical)
- establishing that lesions on MRI scans have developed at different times and are in different anatomical locations for a diagnosis of relapsing-remitting MS
- looking for cerebrospinal fluid-specific oligoclonal bands if there is no clinical or radiological evidence of lesions developing at different times
- establishing progressive neurological deterioration over 1 year or more for a diagnosis of primary progressive MS.

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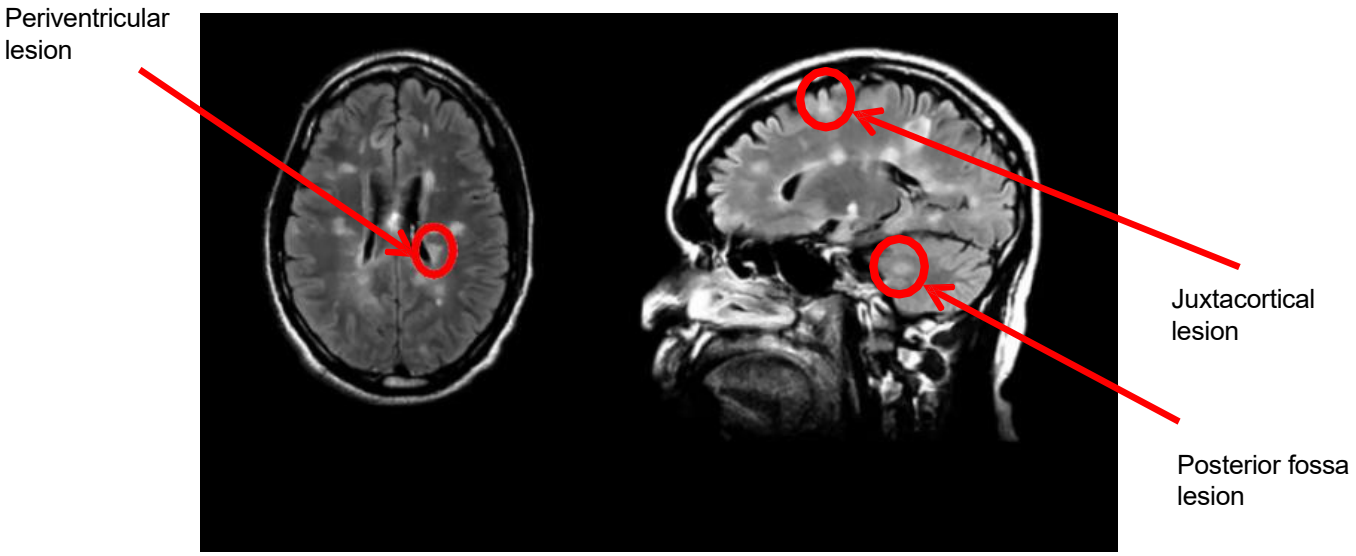
Archetypal MS: Seen on MRI



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Diagnosis of MS

- Neurological exam
- Magnetic resonance imaging (MRI)
- Evoked potential test
- Spinal tap
- Blood tests

Expanded Disability Status Scale (EDSS)

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Complications of Multiple Sclerosis

- Muscle spasms
- Paralysis
- Problems related to bladder, bowel and sexual functions
- Mental changes
- Depression
- Epilepsy

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Treatment for MS

- Disease-modifying therapies
- Hematopoietic Stem Cell Transplantation
- Physiotherapy – advise on movements and exercise
- Complementary and alternative therapies e.g. yoga, aromata therapy.

MS Exercises

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Treatment for MS relapse

- Treatment for a relapse usually involves either:
  - A 5-day course of steroid tablets taken at home (methylprednisolone, 0.5 mg daily)
  - Injections of steroid medicine given in hospital for 3 to 5 days.
- Intravenous methylprednisolone should be considered if oral steroids have failed or not tolerated.
- Steroids can speed up recovery
- Not using steroids more than 3 times a year (if possible) will also help to reduce the risk of side effects.

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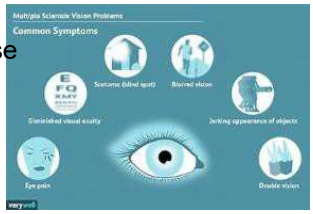
Treatment for MS symptoms

- **Fatigue** – prescribed amantadine. Regular exercise, healthy sleep patterns, energy-saving techniques, avoid medication that can worsen fatigue (painkillers)
- **Visual problems** – gabapentin may help with involuntary eye movements. Some people with double vision may need help from ophthalmologists.
- **Muscle spasms and stiffness** – baclofen / gabapentin or alternative medication e.g. tizanidine, diazepam, clonazepam and dantrolene. Physiotherapy e.g. stretching exercises can help if movement is restricted.
- **Mobility problems** – exercise programme (physiotherapist), medicine for dizziness/tremors, mobility aids, home adaptations.
- **Neuropathic pain** – sharp and stabbing pain; can be treated with duloxetine, gabapentin or carbamazepine, or amitriptyline.
- **Musculoskeletal pain** – physiotherapist may suggest exercise techniques. Alternatively, use a transcutaneous electric nerve stimulation (TENS) machine to stimulate nerves.
- **Emotional problems** – antidepressants or therapy (CBT)
- **Bladder problems** – various medicines can be prescribed. Handheld external stimulators help people empty the bladder. Occasionally, a catheter can be used.



27

Best practices in nursing home

1. Assist individuals with activities that contribute to health or recovery that patients perform unaided when possible (patient must have strength, will, and knowledge)
2. Help individuals carry out prescribed therapy
3. Contribute to behaviour change, resulting in the knowledge and skills necessary to maintain and improve health.
4. Assess and reassess patient understanding and behavioural change,
5. Promote and encourage adherence to treatment.

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- This table lists medications used for symptom management in MS.
- The most common symptoms are outlined, but others which may improve by nursing interventions include tremor, weakness, vertigo, and sexual dysfunction.

Pharmacologic Management of Selected Symptoms in Multiple Sclerosis

Symptoms	*Treatment*	*Nursing Considerations*
Fatigue	• CNS stimulants (pemoline, modafinil) • Amantadine • Selective serotonin reuptake inhibitors (SSRIs), eg, fluoxetine	• Restlessness or sleep disturbance may occur • Help patients with dosing schedule, titrate doses up
Bladder dysfunction	• Anticholinergics (eg, oxybutynin) • Antimuscarinics (eg, tolterodine) • α-Blockers (eg, terazosin)	• Determine if urinary tract infection is present • Monitor retention • Monitor fluid balance • Follow overall elimination pattern • Consider contribution of other medications • Provide strategies to avoid side effects, eg, dry mouth
Bowel dysfunction	*Constipation* • Stool softeners • Bulk-forming agents • Mini-enemas • Stimulants • Suppositories *Urgency/Diarrhea* • Bulk-forming agents • Anticholinergics • Antimuscarinics	• Provide bowel training regimens; many of the medications should not be used long-term • Consider contributory effects of other medications, eg, steroids or antibiotics • Consider lifestyle issues • Encourage exercise • Provide diet counseling
Pain	• Anticonvulsants (phenytoin, carbamazepine, gabapentin, lamotrigine) • Tricyclic antidepressants (amitriptyline, nortriptyline) • SSNRIs (duloxetine hydrochloride)	• Watch for sedation • Start with low doses and titrate up • Monitor outcomes; alter treatment as necessary; supportive measures can help
Spasticity	• GABA antagonists (oral or intrathecal baclofen) • α-Agonists (tizanidine) • Anticonvulsants (diazepam, clonazepam, gabapentin) • Botulinum toxin	• Time doses to maintain therapeutic blood levels • Titrate doses up (especially with baclofen) • Watch for sedation or cognitive symptoms; may require a change in dosage or medication • Combination treatments may help • Intrathecal baclofen requires surgical insertion of programmable pump
Depression	• SSRIs (eg, fluoxetine, sertraline, paroxetine, citalopram) • Tricyclic antidepressants (eg, amitriptyline, nortriptyline) • Atypical antidepressants (eg, venlafaxine, bupropion)	• Evaluate type and degree of depression • Consider contribution of medications (eg, with interferons) • Assess family situation/support network • Consider suicide risk • Promote use of psychiatric services • Advise patient that medication effects may take several weeks • Advise patient not to stop medications suddenly • Reassess patient regularly • Paroxetine can be taken AM or HS, can help with anxiety • Monitor urinary function with venlafaxine (may cause fluid retention)

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Treatment algorithm for single clinical episode with radiological activity (NHS England)

NHS England

Treatment Algorithm for Multiple Sclerosis Disease-Modifying Therapies

NHS England Reference: 170079ALG

Date Published: 4 September 2018
Updated: 8 March 2019

Gateway reference: 07603

Single clinical episode without MRI abnormalities allowing the diagnosis of MS

- No treatment [note 1]

Single clinical episode with MRI abnormalities fulfilling the McDonald criteria for relapsing remitting MS

- No treatment [note 1]
- Interferon beta 1a or glatiramer acetate[note 2]
- Alemtuzumab or ocrelizumab [note 3]

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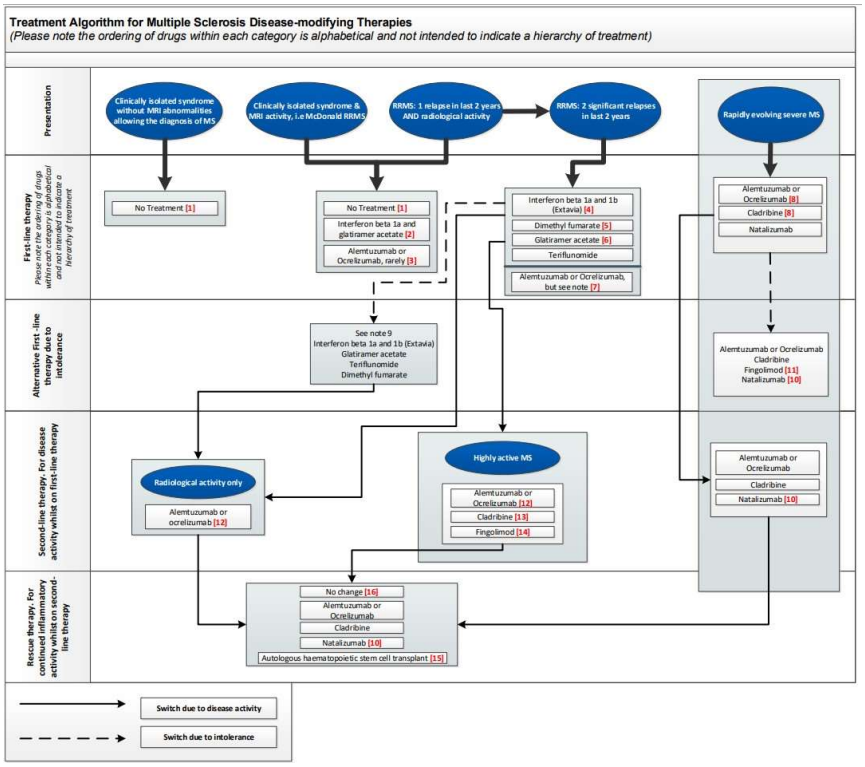
Treatment Algorithm for Multiple Sclerosis Disease-modifying Therapies
(Please note the ordering of drugs within each category is alphabetical and not intended to indicate a hierarchy of treatment)
Presentation
Clinically isolated syndrome without MRI abnormalities allowing the diagnosis of MS
Clinically isolated syndrome & MRI activity, i.e McDonald RRMS
RRMS: 1 relapse in last 2 years AND radiological activity
RRMS: 2 significant relapses in last 2 years
Rapidly evolving severe MS
First-line therapy
Please note the ordering of drugs within each category is alphabetical and not intended to indicate a hierarchy of treatment
No Treatment [1]
No Treatment [1]
Interferon beta 1a and glatiramer acetate [2]
Alemtuzumab or Ocrelizumab, rarely [3]
Interferon beta 1a and 1b (Extavia) [4]
Dimethyl fumarate [5]
Glatiramer acetate [6]
Teriflunomide
Alemtuzumab or Ocrelizumab, but see note [7]
Alemtuzumab or Ocrelizumab [8]
Cladribine [8]
Natalizumab
Alternative First -line therapy due to intolerance
See note 9
Interferon beta 1a and 1b (Extavia)
Glatiramer acetate
Teriflunomide
Dimethyl fumarate
Alemtuzumab or Ocrelizumab
Cladribine
Fingolimod [11]
Natalizumab [10]
Second-line therapy. For disease activity whilst on first-line therapy
Radiological activity only
Alemtuzumab or ocrelizumab [12]
Highly active MS
Alemtuzumab or Ocrelizumab [12]
Cladribine [13]
Fingolimod [14]
Alemtuzumab or Ocrelizumab
Cladribine
Natalizumab [10]
Rescue therapy. For continued inflammatory activity whilst on second-line therapy
No change [16]
Alemtuzumab or Ocrelizumab
Cladribine
Natalizumab [10]
Autologous haematopoietic stem cell transplant [15]
Switch due to disease activity
Switch due to intolerance

x

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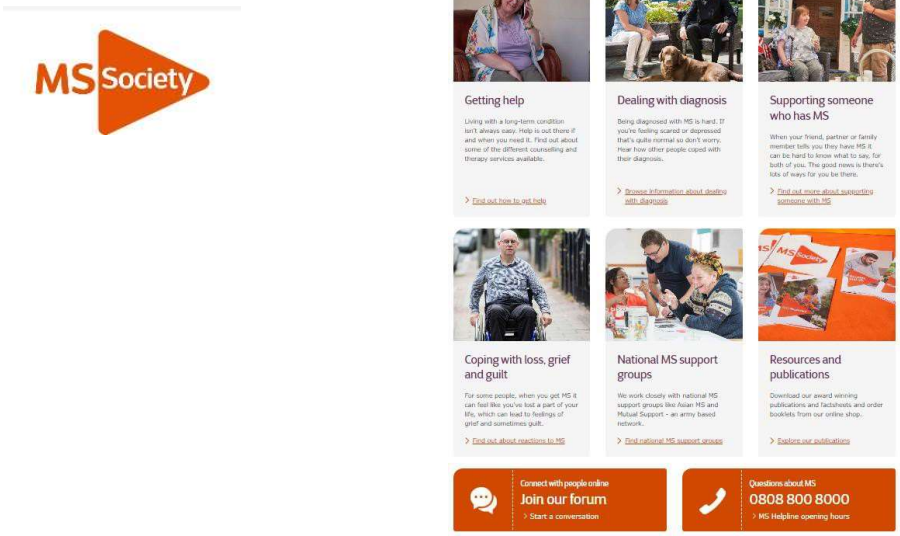
MS Society
Getting help
Living with a long-term condition isn't always easy. Help is out there if and when you need it. Find out about some of the different counselling and therapy services available.
Find out how to get help
Dealing with diagnosis
Being diagnosed with MS is hard. If you're feeling scared or depressed that's quite normal so don't worry. Hear how other people coped with their diagnosis.
Browse information about dealing with diagnosis
Supporting someone who has MS
When your friend, partner or family member tells you they have MS it can be hard to know what to say, for both of you. The good news is there's lots of ways for you be there.
Find out more about supporting someone with MS
Coping with loss, grief and guilt
For some people, when you get MS it can feel like you've lost a part of your life, which can lead to feelings of grief and sometimes guilt.
Find out about reactions to MS
National MS support groups
We work closely with national MS support groups like Asian MS and Mutual Support - an army based network.
Find national MS support groups
Resources and publications
Download our award winning publications and factsheets and order booklets from our online shop.
Explore our publications
Connect with people online
Join our forum
Start a conversation
Questions about MS
0808 800 8000
MS Helpline opening hours

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