بسم الله الرحمن الرحیم

# تازه های مراقبت پرستاری در MS

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# What MS *Is*:

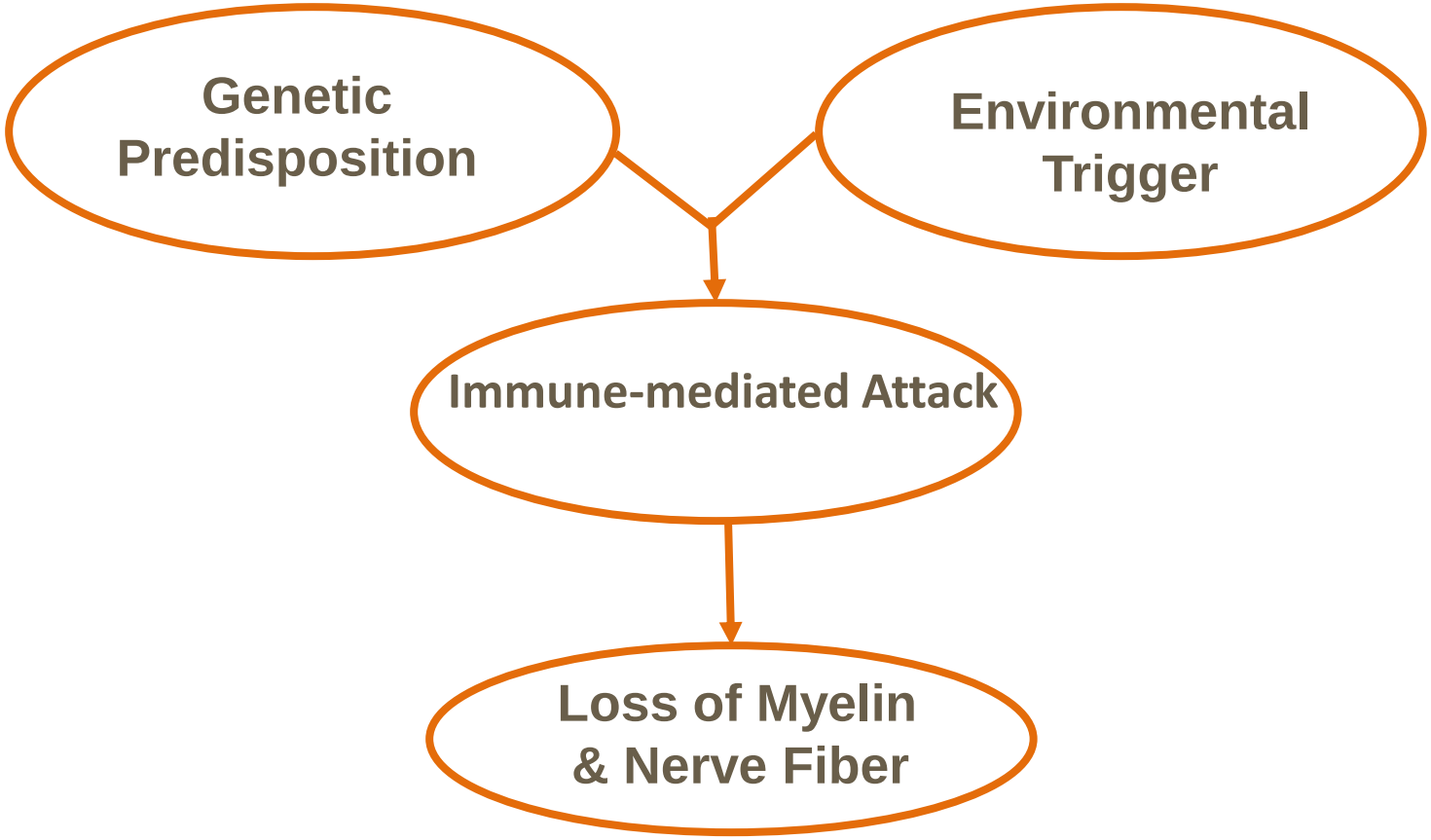
- MS is a chronic disease of the central nervous system that affect young adults in the prime of their lives
- The immune system attacks the myelin coating around the nerves in the central nervous system (CNS—brain, spinal cord, and optic nerves) and the nerve fibers themselves.
- Its name comes from the *scarring* caused by inflammatory attacks at *multiple* sites in the central nervous system.

بیماری MS یک التهاب مزمن سیستم عصبی مرکزی است که عمدتا افراد جوان(۲۰ تا ۴۵ ساله) را درگیر می کند. این بیماری یکی از شایع ترین علل ناتوانی در افراد جوان بوده و تاثیرات زیادی بر کیفیت زندگی فردی و اجتماعی فرد مبتلا می گذارد. هزینه های کنترل و پیشگیری از عودهای مجدد، بار زیادی را بر اقتصاد خانواده و جامعه تحمیل می نماید.

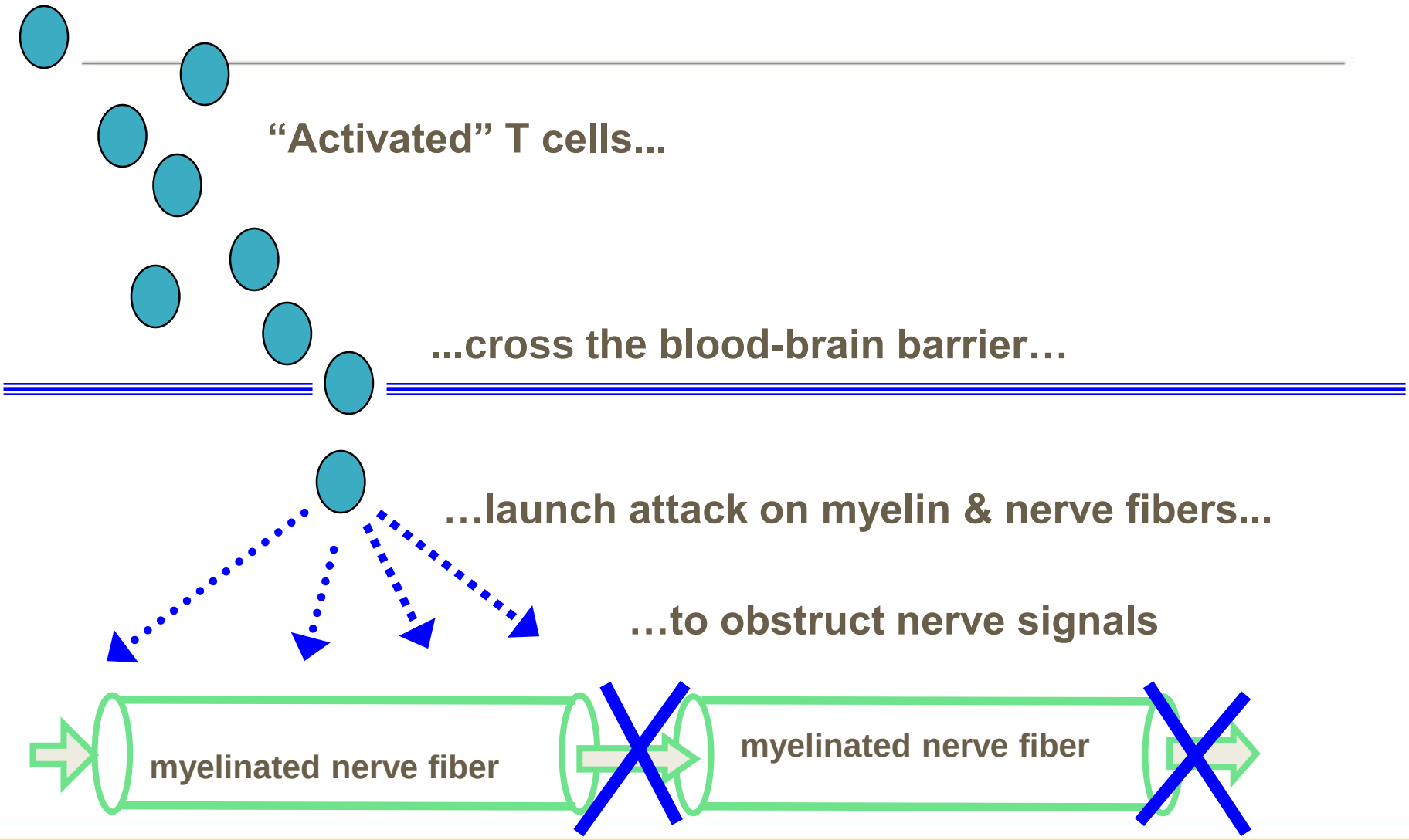
## همه گیری بیماری

شیوع بیماری در نقاط مختلف جهان متفاوت بوده و در برخی از مناطق اروپای غربی و شمال آمریکا، بروز و شیوع بیش از سایر نقاط جهان می باشد به طوری که میانگین بیماری MS برابر ۱۱۲ نفر به ازای هر ۱۰۰ هزار نفر و میانگین بروز ۵/۲ با ازای هر ۱۰۰ هزار نفر جمعیت می باشد. طی سه دهه اخیر شیوع بیماری در کشور ما و به خصوص در مناطق شهری رو به افزایش بوده و مناطق بسیاری در کشور از شیوع متوسط تا بالا برخوردار هستند

# What Causes MS?



# What happens in MS?



# What happens to the myelin and nerve fibers?

# What MS *Is Not:*

- MS is not*:*
  - Contagious
  - Directly inherited
  - Always severely disabling
  - Fatal—except in fairly rare instances
- Being diagnosed with MS is not a reason to*:*
  - Stop working
  - Stop doing things that one enjoys
  - Not have children

# علائم بالینی و شک به بیماری

بر اساس ضایعات دمیلینیتیو و پلاک در مسیر اعصاب حسی و حرکتی، علائم بیماری بروز کرده و پیشرفت نموده

- اختلالات حسی: کرختی و بی حسی اندام و سوزش موضعی در اندام ها
- اختلالات حرکتی: اختلال بلع و تکلم، ضعف و خستگی یا اسپاسم عضلانی فلج اندام به صورت یک یا دو طرفه
- اختلالات بینایی: تاری دید، نقص میدان بینایی، دوبینی و نیستاگموس (علائم بالینی غالبا به صورت یک طرفه بوده و در ۶۰% موارد بروز می کند)

- اختلالات مخچه ای: عدم تعادل و لرزش چشم و اندام، سرگیجه
- درگیری سیستم ادراری: اختلال دفع ادرار، درجاتی از ناتوانی جنسی
- علائم روحی، اختلالات شناختی و ادراکی

# How is MS diagnosed?

- MS is a clinical diagnosis:
  - Signs and symptoms
  - Medical history
  - Laboratory tests
- Requires “dissemination in time and space”:
  - Space: Evidence of scarring (plaques) in at least two separate areas of the CNS
  - Time: Evidence that the plaques occurred at different points in time
- There must be no other explanation

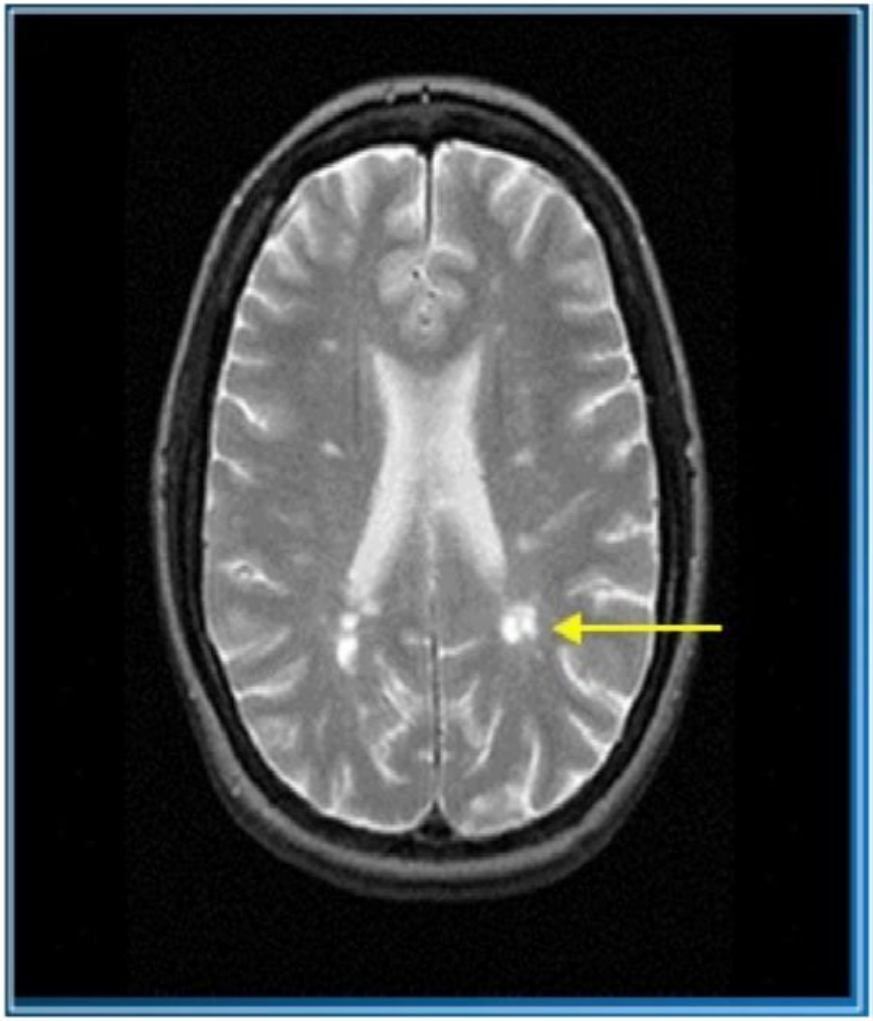
# What tests may be used to help confirm the diagnosis?

- Magnetic resonance imaging (MRI)
- Visual evoked potentials (VEP)
- Lumbar puncture

**Figure 5. T1-weighted axial image**

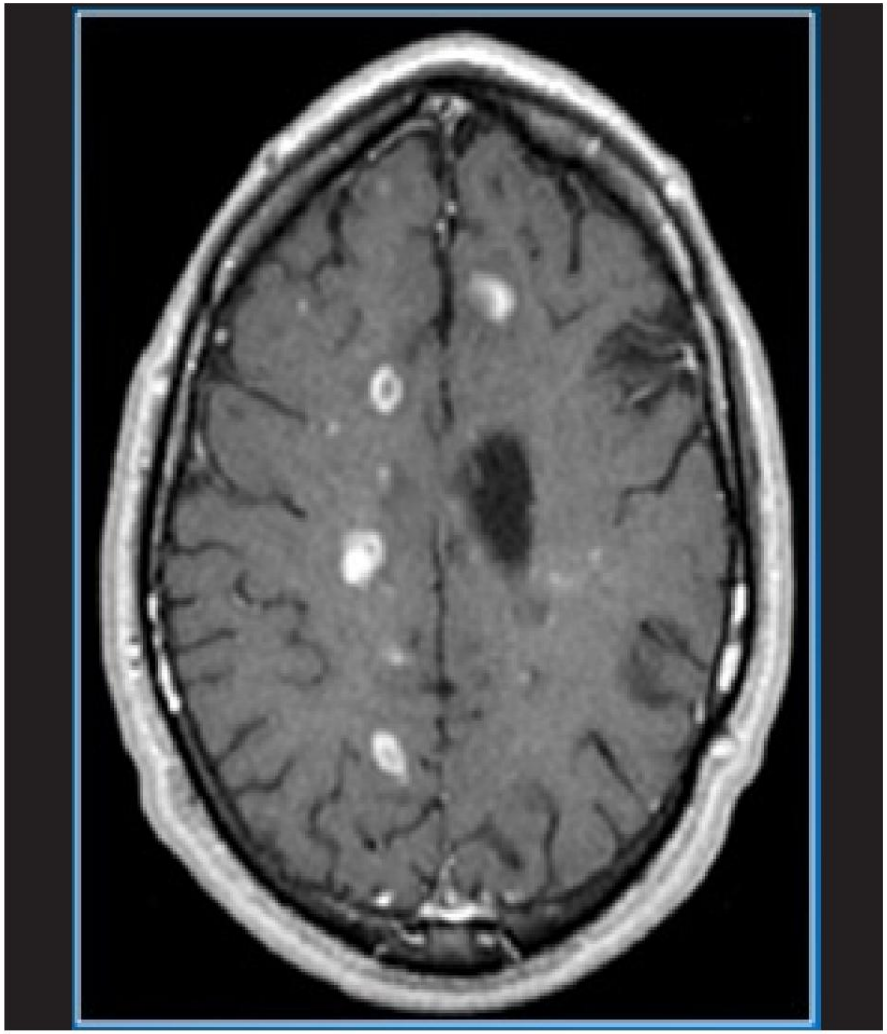
*T1 images emphasize the differences between tissues and show good anatomic detail, but do not demonstrate pathology best. Abnormalities show up dark on T1 images. Courtesy of the International Organization of Multiple Sclerosis Nurses (IOMSN).*

**Figure 6. T2-weighted axial image**



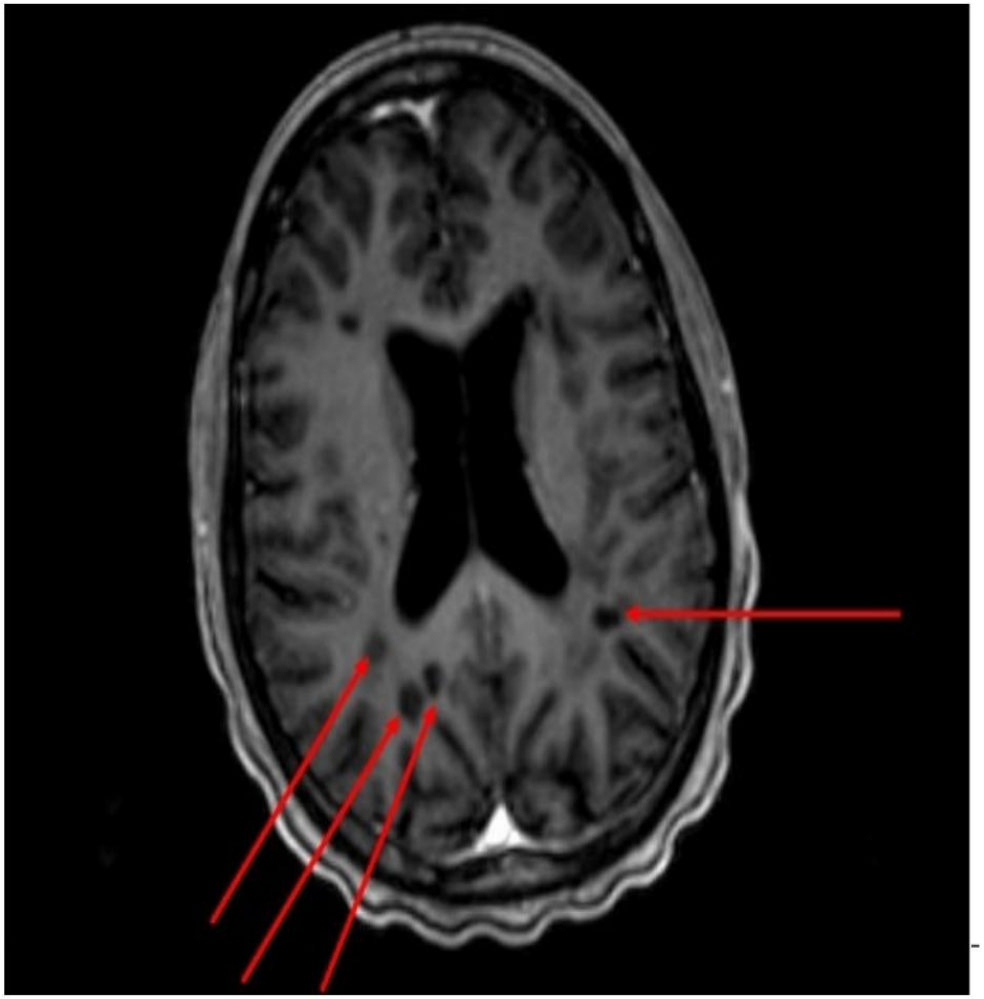
*T2 images are sensitive to increased water content and may be superior at demonstrating pathological changes. Gray matter appears lighter than white matter. MS lesions appear hyperintense or bright. Courtesy of the International Organization of Multiple Sclerosis Nurses (IOMSN).*

**Figure 12. MS lesions on enhanced T1 weighted MRI**



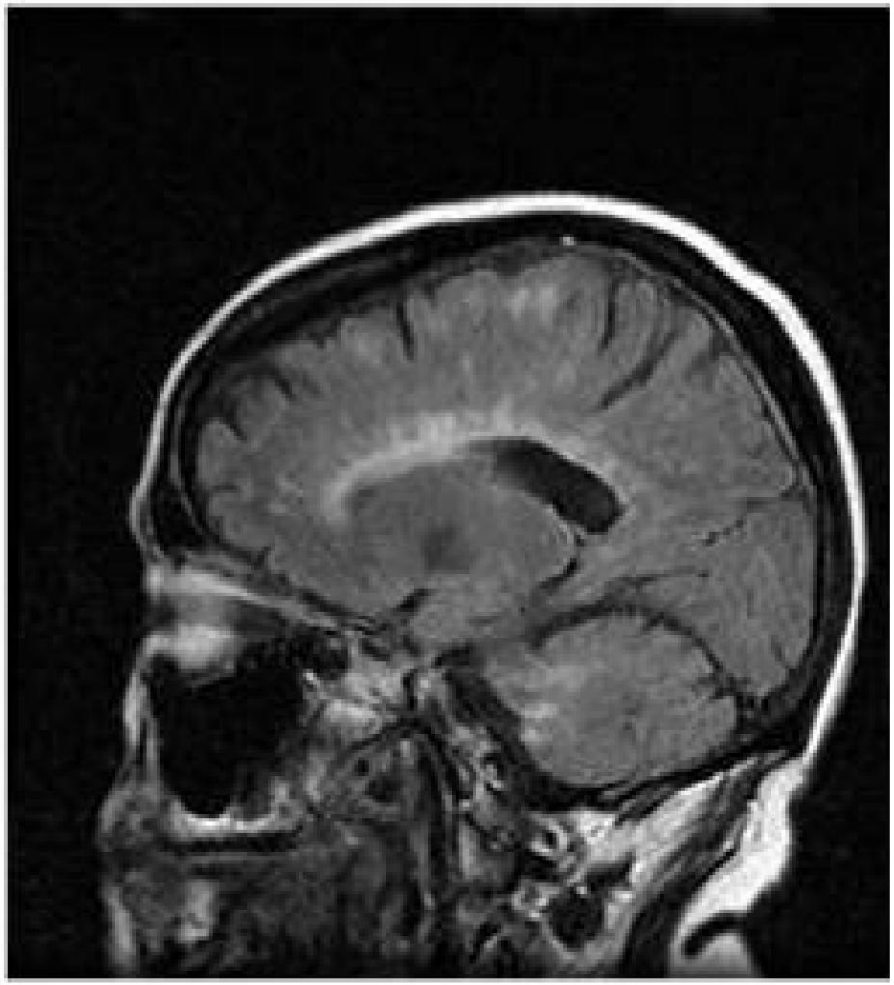
*T1-weighted gadolinium-enhanced MRI showing new and active lesions that appear bright, reflecting areas of blood-brain disruption. Courtesy of the International Organization of Multiple Sclerosis Nurses (IOMSN).*

**Figure 11. MRI demonstrating "black holes"**



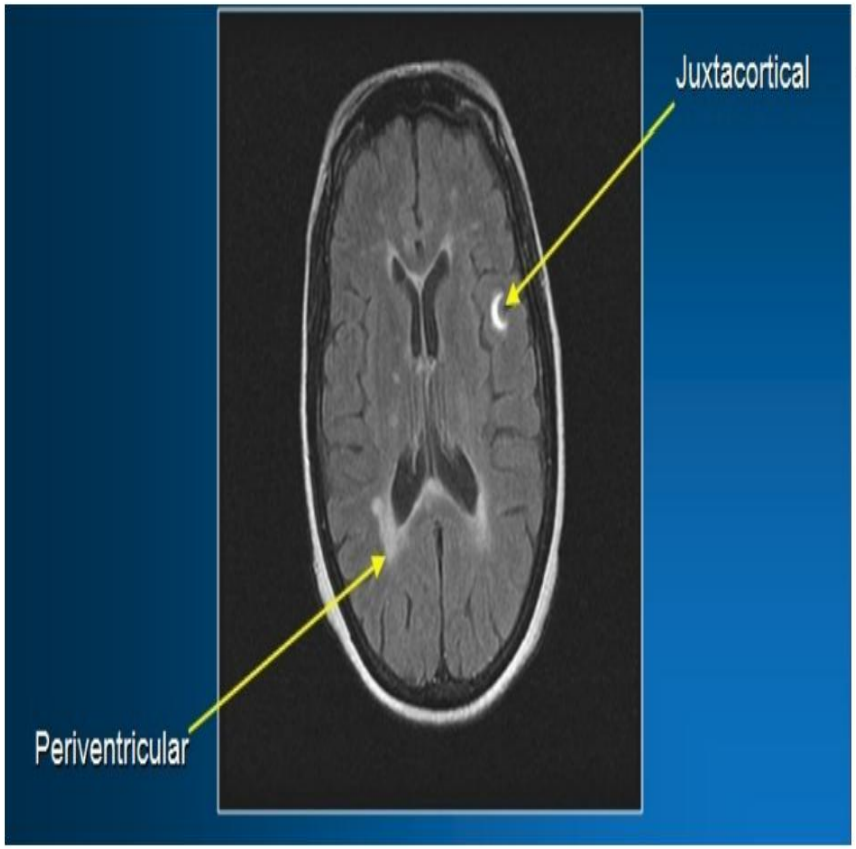
*Courtesy of the International Organization of Multiple Sclerosis Nurses (IOMSN). Original MRI image provided to IOMSN by William Stuart, MD.*

**Figure 7. Sagittal FLAIR image**



*A FLAIR image is a type of T2 image with superior capability for demonstrating demyelinating lesions and shows both new and old lesions clearly. Courtesy of the International Organization of Multiple Sclerosis Nurses (IOMSN). Original MRI image provided to IOMSN by William Stuart, MD.*

**Figure 9. Axial FLAIR imaging showing periventricular and juxtacortical lesions**

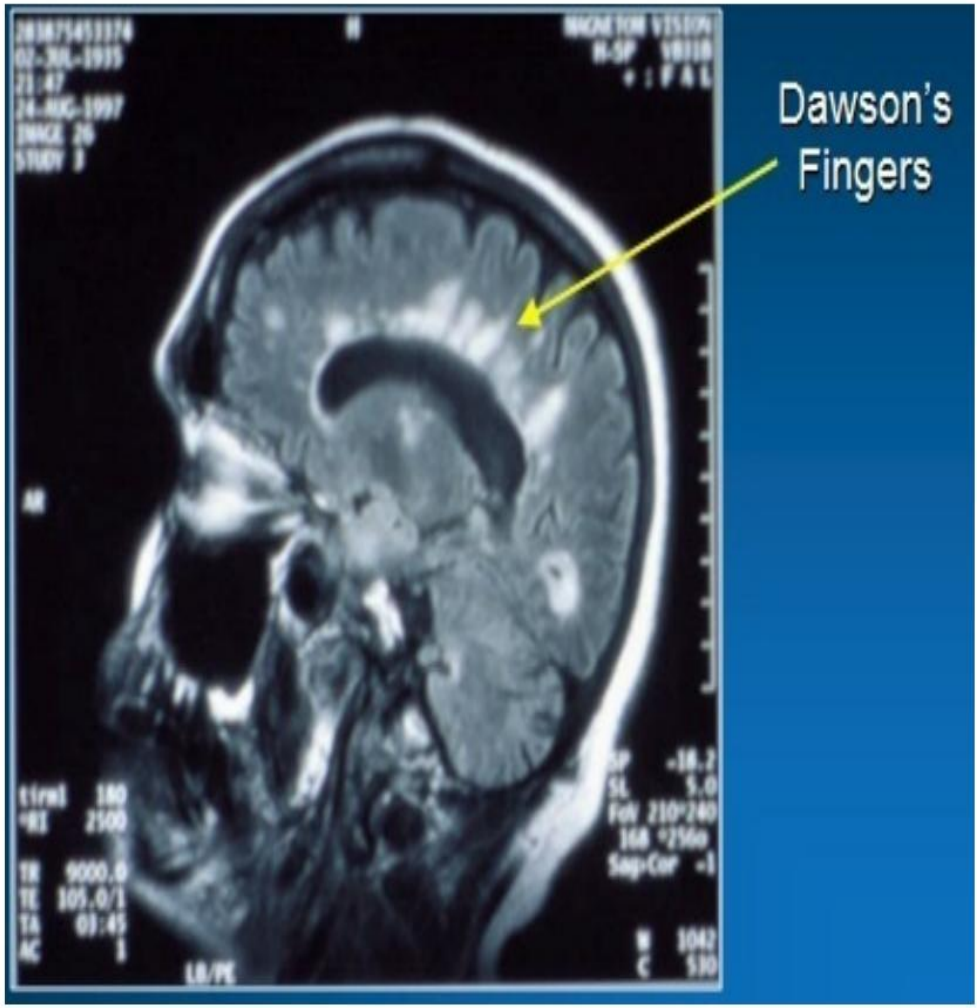



*Courtesy of the International Organization of Multiple Sclerosis Nurses (IOMSN). Original MRI image provided to IOMSN by William Stuart, MD.*

**Figure 8. Spinal cord MRI showing cord lesion**

*Courtesy of the International Organization of Multiple Sclerosis Nurses (IOMSN).*

**Figure 10. MRI demonstrating Dawson's fingers**




*Courtesy of the International Organization of Multiple Sclerosis Nurses (IOMSN).*

# What is the genetic factor?

- The risk of getting MS is approximately:
  - 1/750 for the general population (0.1%)
  - 1/40 for person with a close relative with MS (3%)
  - 1/4 for an identical twin (25%)
- 20% of people with MS have a blood relative with MS

*The risk is higher in any family in which there are several family members with the disease* (aka *multiplex families*)

# What are other known risk factors?

- Smoking – active or passive – is known to increase of risk of MS and of disease progression
- Obesity in adolescence
- Low vitamin D levels
- Exposure to the Epstein-Barr virus

# What is the prognosis?

- One hallmark of MS is its *unpredictability.*
  - Approximately 1/3 will have a very mild course
  - Approximately 1/3 will have a moderate course
  - Approximately 1/3 will become more disabled
- Certain characteristics predict a better outcome:
  - Female
  - Onset before age 35
  - Sensory symptoms
  - Monofocal rather than multifocal episodes
  - Complete recovery following a relapse

# Classification of MS

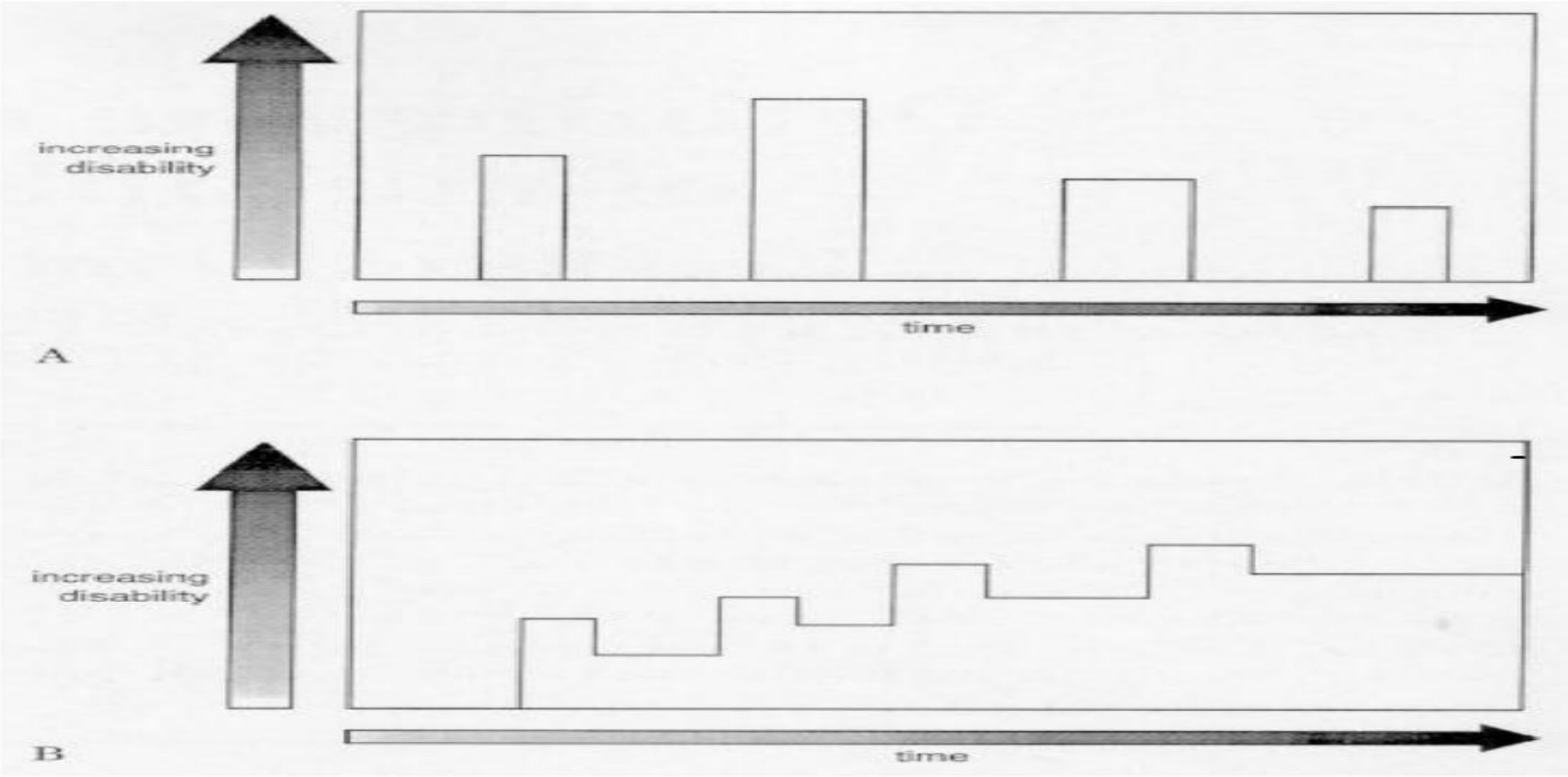
- Relapsing-remitting MS (RRMS)
- Secondary progressive MS(SPMS)
- Primary progressive MS (PPMS)
  - Progressive relapsing MS(PRMS)
  - Clinically isolated MS(CIS)

- ✓ اما بر اساس نقش فعالیت بیماری در MRI (ویرایش ۲۰۱۳) بیماری MS به دو دسته عود کننده و پیشرونده تقسیم می شود که هر کدام از این موارد به دو گروه فعال و غیر فعال تقسیم می گردد. فرم فعال بیماری بر اساس عود یافته بالینی یا ظهور پلاک جدید در MRI تعریف می گردد. لذا یک بیمار پیشرونده می تواند بر اساس یافته بالینی و MRI به دو فرم فعال و غیر فعال تقسیم گردد.

# RRMS(عود کننده-بهبود یابنده)

- Period of acute decline or exacerbations in neurological function followed by a variable degree of recovery with stable periods between attacks
- Relapse(exacerbation) is the appearance of a new or appearance of a prior symptom lasting more than 24 hours.
- Onset of neurologic changes may occur over several hours or appear over days to weeks.
- Symptoms may be focal and can spread over other body regions.
- A relapse may last from a few days to several weeks or more.
- Full or partial recovery may occur with the disease remaining stable between relapses
- Treatment with immune-modulating therapies and corticosteroids is indicated
- About %80-85% of people are diagnosed with RRMS

**Figure 1. Characterization of the natural history of relapsing-remitting multiple sclerosis**

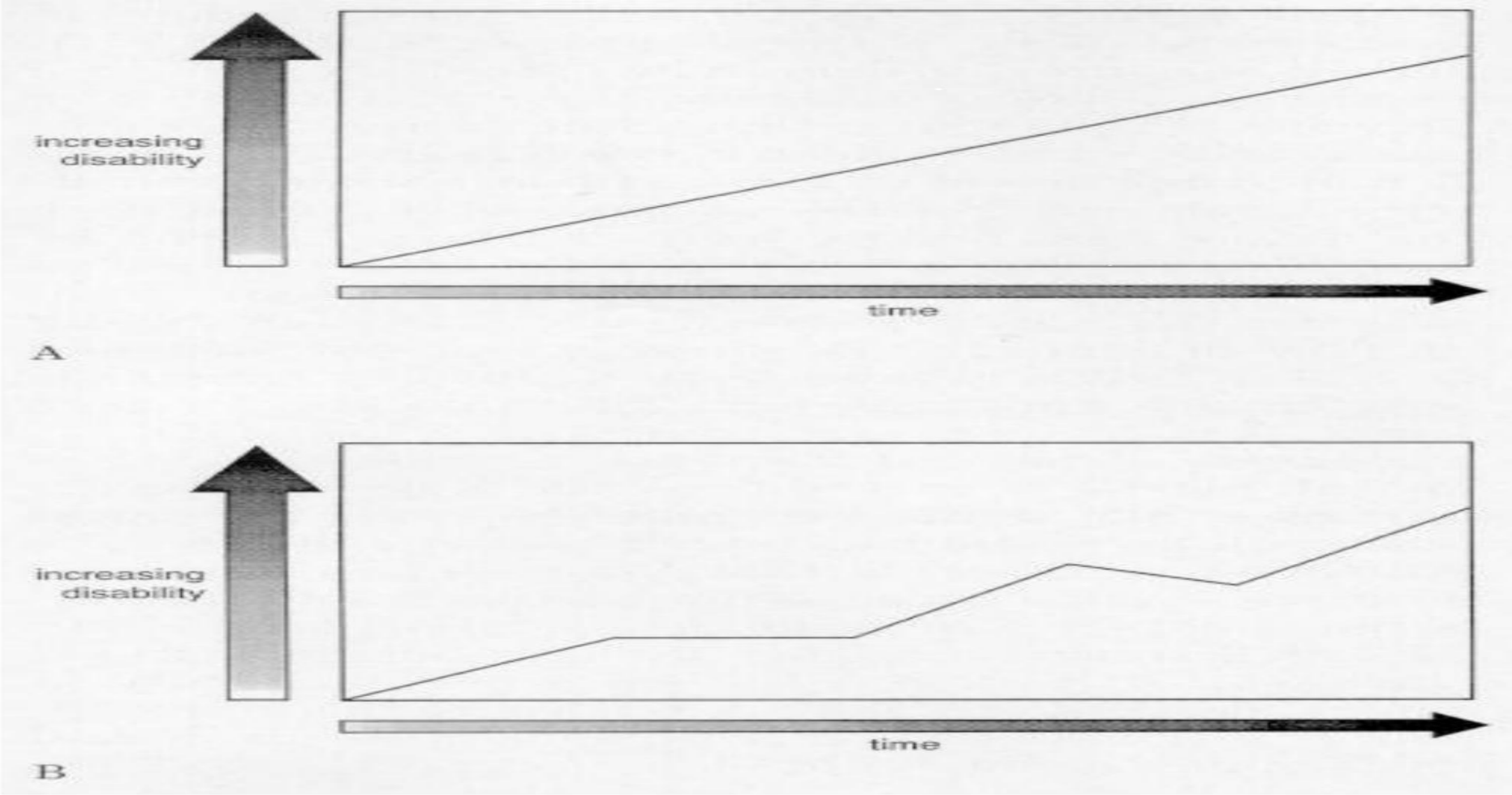



*Relapsing-remitting (RR) MS is characterized by clearly defined acute attacks with (A) full recovery or (B) sequelae and residual deficit upon recovery. Periods between disease relapses are characterized by lack of disease progression. From Lublin, F. D., & Reingold, S. C. Defining the clinical course of multiple sclerosis: Results of an international survey. National Multiple Sclerosis Society (USA) Advisory Committee on Clinical Trials of New Agents in Multiple Sclerosis* Neurology, 46*(4):907–911. Reproduced with permission from Wolters Kluwer Health.*

# PPMS(پیشرونده اولیه)

- A gradual onset of symptoms that worsen over time with minor fluctuation that progress and do not reverse
- Most common presenting symptoms include: progressive spastic paraparesis, impaired mobility with weakness, stiffness and dragging of the legs.
- Some patients may experience profound disability within 1-2 years, whereas in others, may occur over decades
- About%10- 15% of people are diagnosed with this course and age of onset is approximately 10 years older than that seen in RRMS

## Figure 2. Characterization of the natural history of primary progressive multiple sclerosis

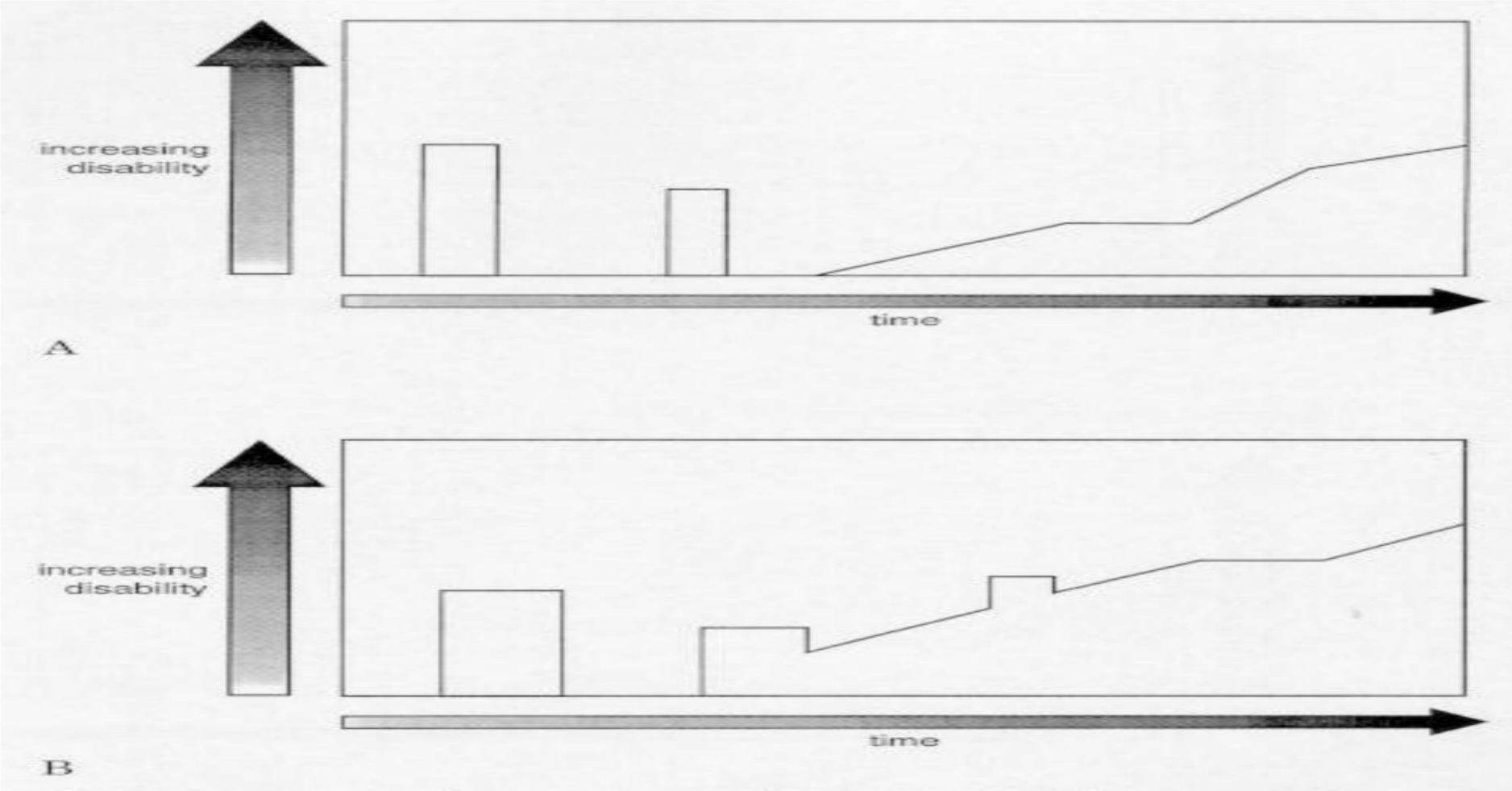



*Primary progressive (PP) MS is characterized by disease showing progression of disability from onset (A) without plateaus or remissions or (B) with occasional plateaus or temporary minor improvements. From Lublin, F. D., & Reingold, S. C. Defining the clinical course of multiple sclerosis: Results of an international survey. National Multiple Sclerosis Society (US) Advisory Committee on Clinical Trials of New Agents in Multiple Sclerosis* Neurology, 46*(4):907–911. Reproduced with permission from Wolters Kluwer Health.*

# SPMS(پیشرونده ثانویه)

- Is seen as the long-term outcome of RRMS, which occurs once the baseline between relapses becomes progressively worse
- The transition from RRMS to SPMS may be rapid or gradual
- SPMS patients also present with fewer acute
- Approximately 50% of people diagnosed with RRMS will eventually transition to SPMS
- The frequency of relapses decreases, and patients experience an increase in disability

**Figure 3. Characterization of the natural history of secondary progressive multiple sclerosis**




*Secondary progressive (SP) MS begins with an initial RR course, followed by (A) progression of variable rate that may also include (B) occasional relapses and minor remissions. From Lublin, F. D., & Reingold, S. C. Defining the clinical course of multiple sclerosis: Results of an international survey. National Multiple Sclerosis Society (US) Advisory Committee on Clinical Trials of New Agents in Multiple Sclerosis* Neurology, 46*(4):907–911. Reproduced with permission from Wolters Kluwer Health.*

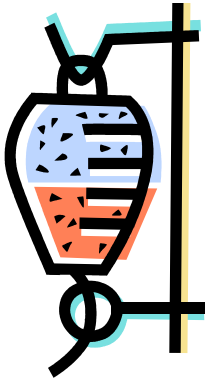
# PRMS(پیشرونده و عودکننده)

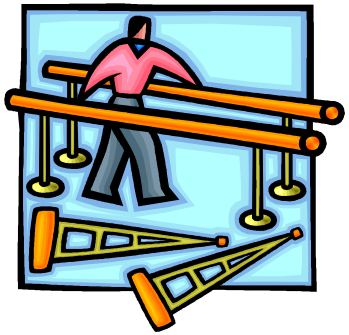
- PRMS appears to progress clinically as seen in PPMS with acute relapses and full recovery may or may not occur
- PRMS has a progressive onset with acute inflammatory activity in the CNS with relapses. These relapses can respond to short-term anti-inflammatory therapies

# CIS (حمله ایزوله بالینی)

- CIS یا حمله ایزوله بالینی مغز که منطبق بر بیماری میلین زدا بوده و ناشی از **درگیری یکی از نواحی عصب اپتیک، نخاع، ساقه مغز یا نیم کره های مغز باشد** و این بیماران ریسک تبدیل شدن به ام اس را دارند.
- بیماران CIS از نظر ریسک تبدیل شدن به ام اس بر اساس یافته های موجود در MRI به سه دسته بیماران با ریسک پایین، متوسط و بالا تقسیم می شوند.

# An Overview of Treatment Strategies





# What are the treatment strategies?

- ✓ Treatment aims include decreasing the frequency and number of relapses, limiting disability, and relieving symptoms

Management of MS is directed toward:

- Relapse management
- Disease modification
- Symptom management

# ۱-درمان دارویی

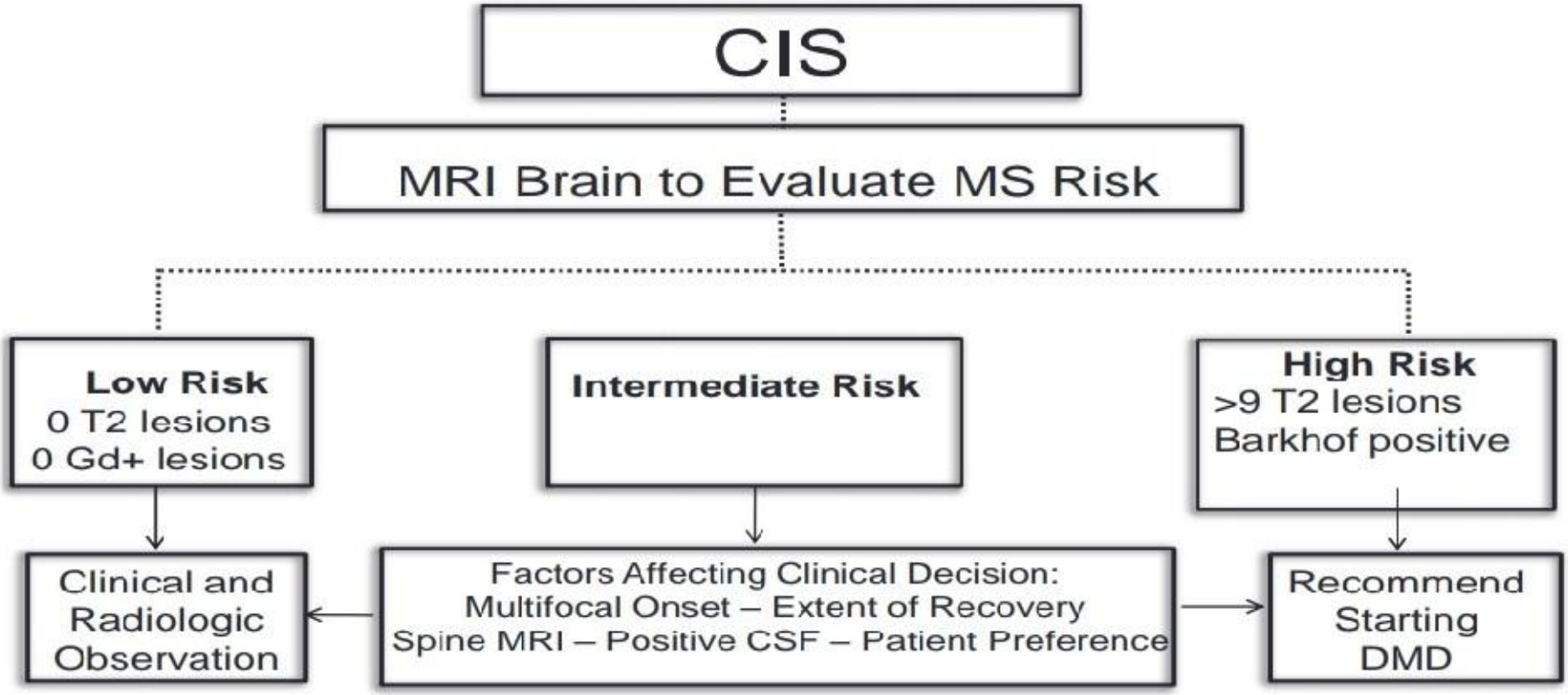
بیماران MS از نظر شروع درمان به دو دسته تقسیم می شوند:

۱. Non aggressive:

۲. Aggresive: به بیمارانی گفته می شود که در طی یک سال اخیر دو حمله واضح بالینی را تجربه نموده اند و دارای MRI فعال هستند.

- ✓ بیماران aggressive در تعاریف جدید می توانند به دو دسته highly active یا Rapidly evolving aggressive تقسیم شوند.

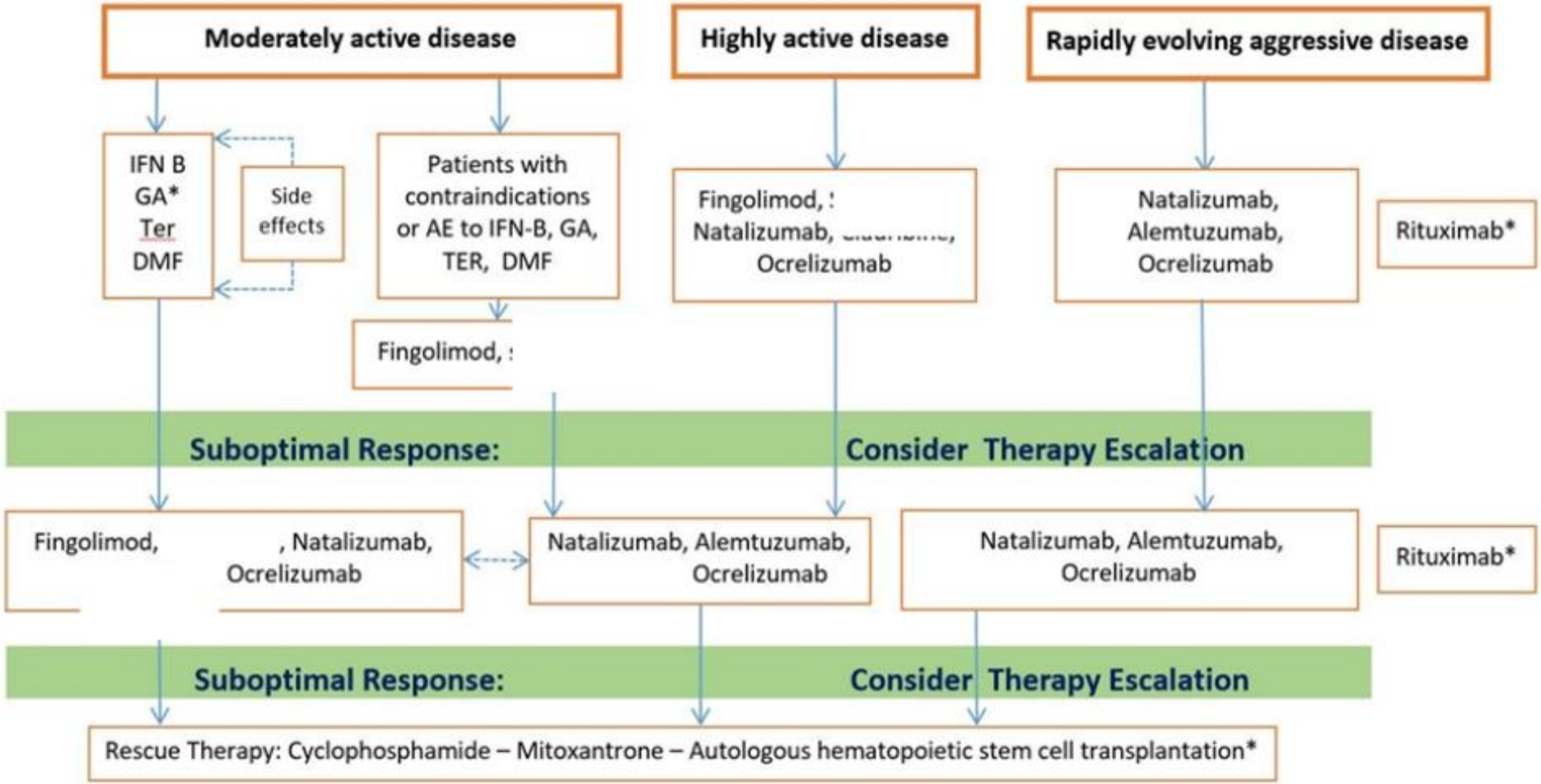
# درمان CIS


CIS
MRI Brain to Evaluate MS Risk
Low Risk
0 T2 lesions
0 Gd+ lesions
Intermediate Risk
High Risk
>9 T2 lesions
Barkhof positive
Clinical and Radiologic Observation
Factors Affecting Clinical Decision:
Multifocal Onset – Extent of Recovery
Spine MRI – Positive CSF – Patient Preference
Recommend Starting DMD

# ادامه درمان دارویی

داروهای مورد تایید جهت درمان ام اس:

- خط اول درمان: ترکیبات اینترفرون بتا، گلاتیرامر استات، تری فلونامید و دی متیل فومارات
- خط دوم: فینگولیمود، ناتالیزوماب، اکرلیزوماب
- خط سوم: آلمتوزوماب و داروهای غیر مصوب FDA مانند ریتوکسیماب




*Off label use

**Table 6. Key Features of the Disease-Modifying Agents**

| Agent (Brand Name) | Interferon ß-1b (Betaseron®, Extavia®) | Interferon ß-1a (Avonex®) | Interferon ß-1a (Rebif®) | Glatiramer acetate (Copaxone®) | Natalizumab (Tysabri®) | Mitoxantrone (Novantrone®) | Fingolimod (Gilenya™) |
|---|---|---|---|---|---|---|---|
| Description | • Recombinant agent, produced in E. coli<br>• Unglycosylated<br>• Amino acid sequence differs from naturally occurring interferon with a serine substituted for the cysteine residue at position 17 | • Recombinant agent produced from Chinese hamster ovary cells<br>• Glycosylated<br>• Identical in amino acid content and sequence to human β-interferon | • Recombinant agent produced from Chinese hamster ovary cells<br>• Glycosylated<br>• Identical in amino acid sequence to human ß-interferon | • Synthetic polypeptide<br>• Approximates the antigenic structure of myelin basic protein | • Recombinant humanized monoclonal antibody produced in murine myeloma cells | • Synthetic antineoplastic anthracendione | Binds to the sphingosine-1-phosphate receptor, or S1P receptor on immune cells, including T cells and B cells. Induces immune cells to remain in lymph nodes, inhibiting them from migrating into the brain and spinal cord. |
| Indication (United States) | Relapsing forms of MS to reduce frequency of relapses, CIS | Relapsing forms of MS to slow accumulation of physical disability and decrease frequency of relapses, CIS | Relapsing forms of MS, to delay accumulation of physical disability and decrease frequency of relapses | RRMS to reduce frequency of relapses, CIS | Relapsing forms of MS to delay accumulation of physical disability and reduce frequency of relapses | SPMS, PRMS, or abnormally worsening RRMS, for reducing neurological disability and frequency of relapses | Reducing the frequency of clinical relapses and delaying the accumulation of physical disability in relapsing forms of MS. |
| Dosage/ Route/ Administration | 0.25 mg/l subcutaneous injection every other day | 30 µg/l intramuscular injection weekly | 22 µg or 44 µg/l subcutaneous injection 3 times weekly, preferably on same 3 days and at the same time (e.g., late afternoon or evening) | 20 mg/l subcutaneous injection daily | 300 mg/IV infusion over 1 hour every 4 weeks | 12 mg/m² (cumulative lifetime dose not to exceed 140 mg/m²)/ IV infusion administered for 5 to 15 minutes every 3 months | 0.5 mg orally daily |
| Nursing Considerations | • Injection-site rotation and skin management<br>• Laboratory monitoring*<br>• Neutralizing antibodies<br>• Hematological/ hepatological abnormalities<br>• Flu-like symptoms, depression, other side effects | • Injection-site rotation and skin management<br>• Laboratory monitoring<br>• Neutralizing antibodies<br>• Hematological/ hepatological abnormalities<br>• Flu-like symptoms, depression, other side effects | • Injection-site rotation and skin management<br>• Laboratory monitoring<br>• Neutralizing antibodies<br>• Hematological/ hepatological abnormalities<br>• Flu-like symptoms, depression, other side effects | • Injection-site rotation and skin management<br>• Immediate post-injection reaction, lipoatrophy, other side effects | • Only available under TOUCH® Prescribing Program<br>• PML, hypersensitivity reactions, signs of liver injury, other side effects | • Cardiotoxicity (increases with cumulative dose):<br>• Patients should be monitored for evidence of cardiotoxicity prior to each dose, and total cumulative lifetime dose is not to exceed 140 mg/m²<br>• AML<br>• Other side effects | Requires 6 hours first dose monitoring. Caution should be used in patients who may be at risk of developing bradycardia or heart blocks, macular edema, active infections, hypertension, hepatic dysfunction, and respiratory disorders. |

# Figure 15. Lipoatrophy

*Courtesy of Colleen Harris, MN MSCN*

## Figure 14. Erythema, bruising, glatiramer acetate

*Courtesy of Kathleen Costello, MS ANP-BC MSCN*

# Figure 13. Erythema, Interferon β-1a SC

*Courtesy of Colleen Harris, MN MSCN*

# معیارهای عدم پاسخ و تغییر خطوط دارویی

پس از شروع درمان توصیه می گردد ۶ تا ۱۲ ماه بعد MRI مجدد انجام گیرد. وجود یکی از نشانه های زیر بیانگر عدم پاسخ به درمان و تغییر درمان می باشد:

۱. بیمارانی که حین مصرف دارو دچار عود بالینی همراه با افزایش پلاک در MRI شوند.
۲. بیمارانی که بدون افزایش پلاک، حمله شدید بالینی داشته باشند.
۳. بیمارانی که حداقل ۳ ضایعه جدید در MRI داشته باشند

# ۲-درمان حمله حاد MS (Relapse Treatment)

- ✓ در صورتی که بیمار ام اس از هر نوع یا تیپ بیماری دچار حمله حاد شود در صورت نداشتن کنتراندیکاسیون به مدت ۳ تا ۱۰ روز تحت درمان با پالس تراپی (آمپول متیل پردنیزولون با دوز ۱ گرم) قرار می گیرد. در صورت عدم پاسخ بیمار این پروتکل پس از ۲ هفته بر اساس نظر پزشک قابل تکرار است.
- ✓ در صورت عدم پاسخ بیمار به پالس تراپی بر اساس نظر پزشک، جهت بیمار پلاسما فرزیس با دوز ۲-۱ لیتر روزانه با جایگزین آلبومین ۲۰درصد انجام می شود.
- ✓ در بیمارانی که به هر دلیلی پالس کورتون ممنوعیت داشته باشد برای وی مستقیما از پلاسمافرزیس (۱۵-۵ روز) و در صورت عدم امکان بر حسب نظر پزشک IVIG (۲گرم/کیلو/روز) به مدت ۵ روز تجویز می گردد

# پیشگیری و کنترل عوارض جانبی

مهم ترین عوارض جانبی درمان بیماری: آلرژی و حساسیت دارویی

راه پیشگیری: شامل قطع دارو و اطلاع به پزشک معالج و تصمیمی برای تغییر نوع داروی مصرفی، بستری موقت در زمان بروز آلرژی نسبت به تغییر داروهای تزریقی و حمایت از راه های تنفسی و استفاده از آنتی هیستامین و کورتون جهت رفع علائم

# 3-Symptom management

- People with MS may experience a wide range of symptoms.
- These may vary from person to person, and symptoms may vary within one individual patient
- The varied range of symptoms includes **fatigue, pain, spasticity, numbness and tingling in the extremities, general weakness, visual impairments, bowel and bladder dysfunction, sexual dysfunction, cognitive disabilities, depression, anxiety and diminished self-efficacy**

# Drugs for symptom management

- If symptoms appear to be related to relapse, short course of corticosteroid
- NSAIDS
- Antispasticity agents: baclofen, tizanidine
- Antiseizure medication: phenytoin, gabapentin, pregabalin, carbamazepine
- Antidepressant medications: trazadone, amitryotilline
- And….

✓ **Complementary and alternative medicine(CAM):**

- **Massage**
- **Guided imagery**
- **Yoga**
- **Relaxation techniqes**

# pain

- The nurse should conduct intermittent assessment for pain, dysthesia and spasticity
- Evaluate for the loss of neuroprotective sensation and the potential for pressure ulcer development
- Evaluate the patient for triggering and alleviating factors
- Evaluate the effectiveness of pharmacologic therapies
- Provide patient with emotional support and evaluate for anxiety

# Visual and hearing impairment

- Encourage regular eye examination
- Be aware of the potential for hearing changes and assess as needed
- Provide education regarding the patients particular visual and hearing symptom experience
- Support the patient as visual and hearing impairment may reduce overall function
- Promote safety through education and counseling related to effective lighting, scanning, and environmental modification

# Fatigue

- Nurses should be aware of and assess for secondary causes of fatigueto include depression, medication side effects, pain and sleep disorders
- Educate and counsel patients regarding energy conservation strategies, including the role of body temprature control
- The nurse should be aware of the optimal timing of medication administration to enhance energy level and to avoid interrupting sleep

# Management of mobility disturbance

- Identify functional effect of impaired and collaborate with interdisciplinary team members to promote optimal mobility within the patients limitations
- Exercise promotion
- Educate patient and care partners regarding treatment, therapy recommendations, medications and support adherence
- Encourage safety by reinforcing appropriate and safe use of adaptive equipment and aids
- Assess for psychological effect of reduced mobility and/or increased ability

# bowel symptoms

- Assess the patients for disorders of bowel function and assess effectiveness of treatments or behavioral strategies over time.
- educate patient that bowel interventions may take a long time to become effective and that worsening of symptoms without any relief from strategies may indicate disease progression

# Bladder management

- Assess all patients for urinary dysfunction and assess effectiveness of treatment
- Assess for infection and assist in management strategies to reduce risk of infection, stone formation or worsening of neurologic condition
- Behavior management
- Intermittent self catheterization
- Long-term indwelling catheters

# Dysphagia management

- Assess the patient regularly for swallowing difficulties
- Monitor weight at each visit
- Educate and counsel the patient to reinforce safe swallowing practices

# Cognitive dysfunction management

- The nurse should screen for factors that could increase Cognitive problems such as medications, sleep disturbance, inadequately treated pain, and untreated symptoms
- Nurses need to recognize and acknowledge the distressing nature of cognitive deficits
- Patients should be provided with verbal and written instructions regarding the need to reduce distractions and implement safety measures

# Depression

- Other roles are to assist patients and care partners to adjust to changes involved in living with MS
- Identify the physical, emotional, spiritual and educational needs of the patient and family
- Reinforce the importance or medication side effects
- Be alert to cues related to mood changes and treatment outcomes and encourage participation in a regular pattern of exercise to improve mood

# Patients and care partners education

- Nurses should use an evidenced-based and wellness-focused approach to education and counseling to assist patients with MS and other family to adhere to the treatment regimen, manage their symptoms, and cope with their chronic disease
- The nurse should screen for factors that could influence the ability to learn, such as cognitive difficulties and health literacy issue, and adapt teaching as appropriate

# منابع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سپاس از حسن
توجه شما