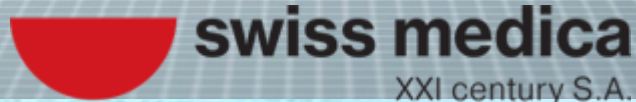


# THE PROBLEM OF MULTIPLE



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# THE PROBLEM OF MULTIPLE

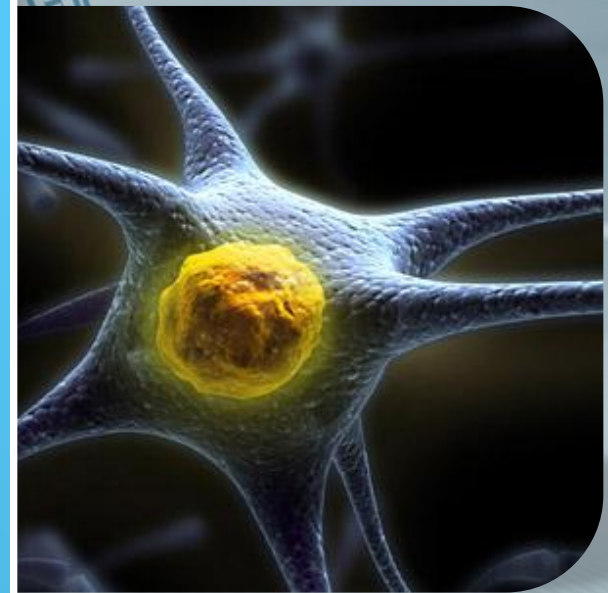


## INTRODUCTION

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# THE PROBLEM OF MULTIPLE

Multiple sclerosis (MS) also known as disseminated sclerosis (DS).



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# THE PROBLEM OF MULTIPLE

This nosology was first described in 1868 by French neurologist Jean-Martin Charcot.



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MS is a demyelinating disease of the central nervous system.

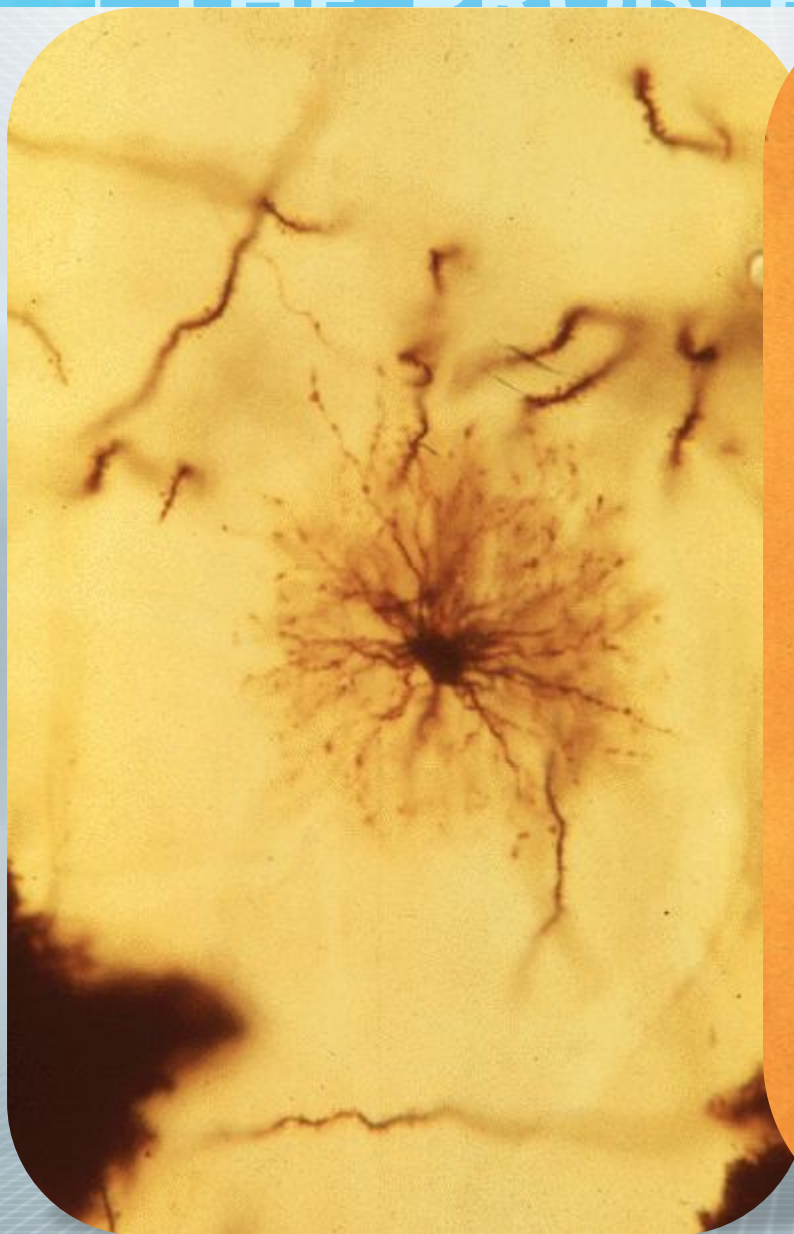


# THE PROBLEM OF MULTIPLE

That affects the myelin sheath oligodendrocytes, glial cells covering the axons of the neurons of the brain and spinal cord.



# THE PROBLEM OF MULTIPLE



Violation of axonal conduction results in loss of the ability to communicate the different structures of the central nervous system (CNS).



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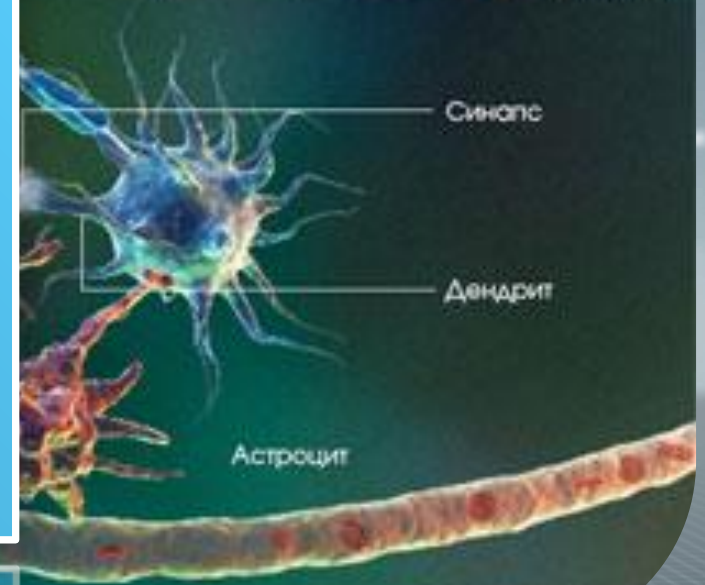
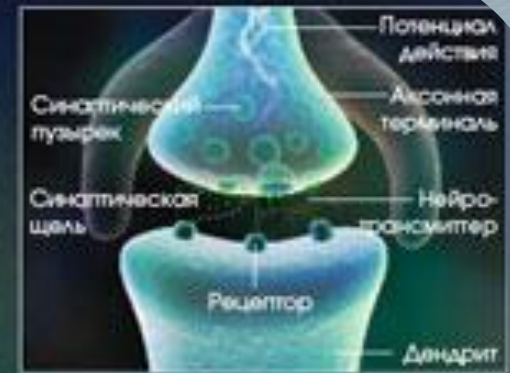
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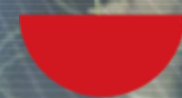
# THE PROBLEM OF MULTIPLE

As a result, there are various neurological and psychiatric symptoms and syndromes, the totality of which cause a variety of clinical picture of multiple sclerosis.



# THE PROBLEM OF MULTIPLE

Manifestations of MS can be very diverse from the mental and intellectual disorders to gross motor, and sensory dysfunction.



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# THE PROBLEM OF MULTIPLE



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всем телу  
сигналы в мозг и по  
всему телу

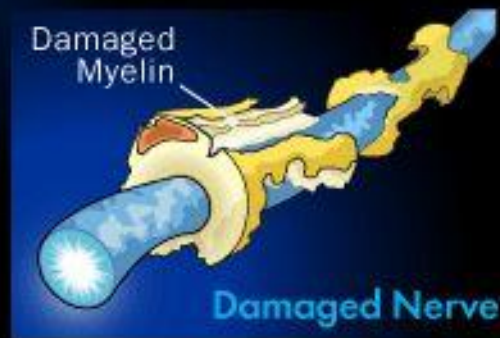
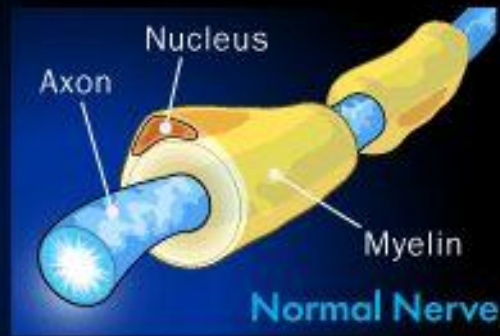
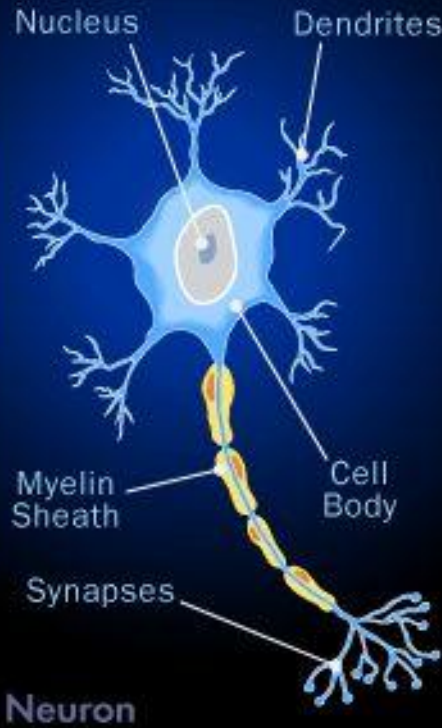


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# THE PROBLEM OF MULTIPLE SCLEROSIS

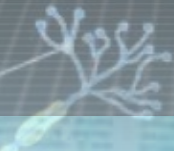
## How Multiple Sclerosis Works Demyelination



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Neuron

Синапсы



Нерв



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## Forms of MS

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Disseminated sclerosis (DS) has several major clinical forms of the disease, in which the dynamics of symptoms varies.



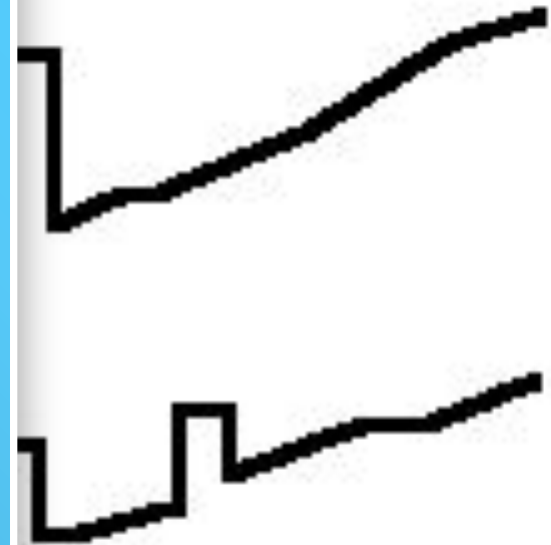
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The debut of the disease or the emergence, new pathological symptoms, and after that her smooth partial regression characteristic of relapsing forms of MS.



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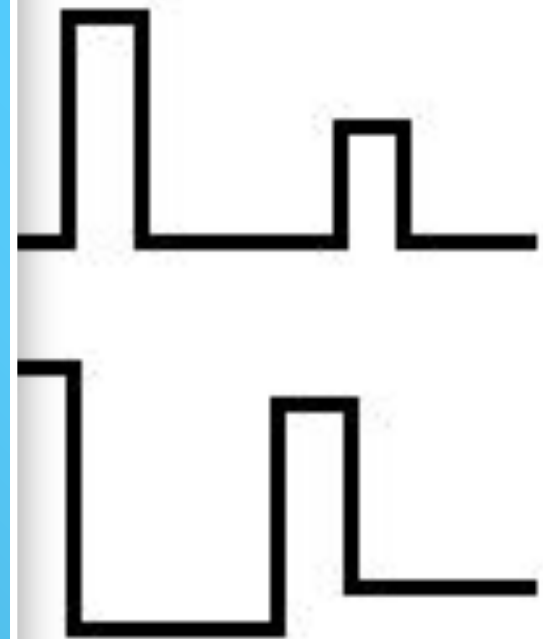


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# THE PROBLEM OF MULTIPLE

Between attacks, symptoms may disappear completely. However, permanent neurologic deficit is very characteristic of the disease.



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# THE PROBLEM OF MULTIPLE

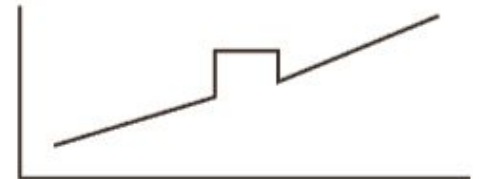
Редивуючо-ремітуючий РС



Вторинно прогресуючий



Прогресуючо-рецидивуючий РС



The progression of old symptoms, the growth and the emergence of new, more typical of the progressive forms of MS.

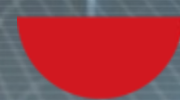
# THE PROBLEM OF MULTIPLE

Multiple Sclerosis dispersed in space and time, as the demyelinating lesions scattered in the space of the white matter of the central nervous system and are scattered in the time of their appearance. .



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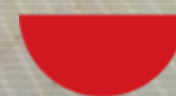
# THE PROBLEM OF MULTIPLE

The name "multiple sclerosis" is named because of the identified at postmortem autopsy specific multiple non-specifically localized "scars".



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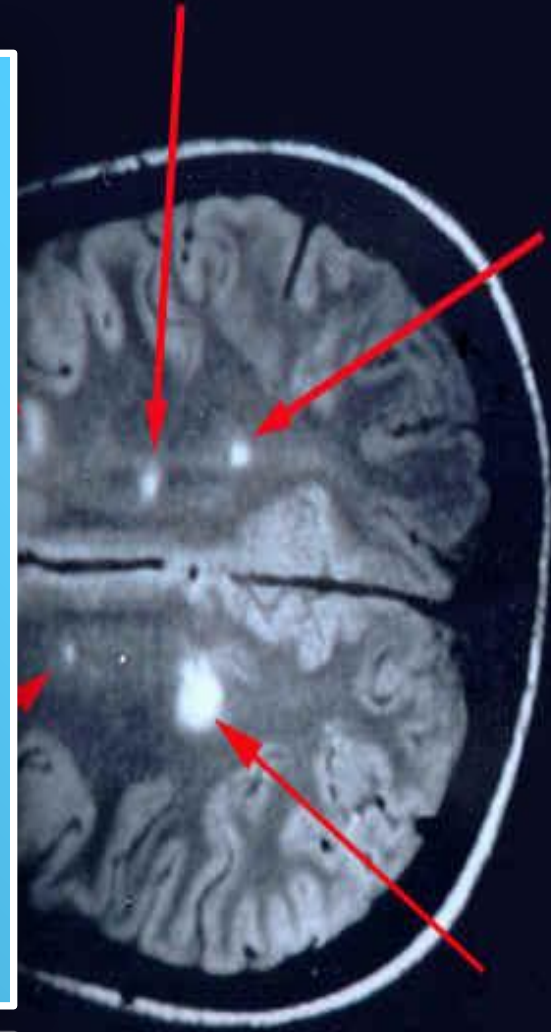


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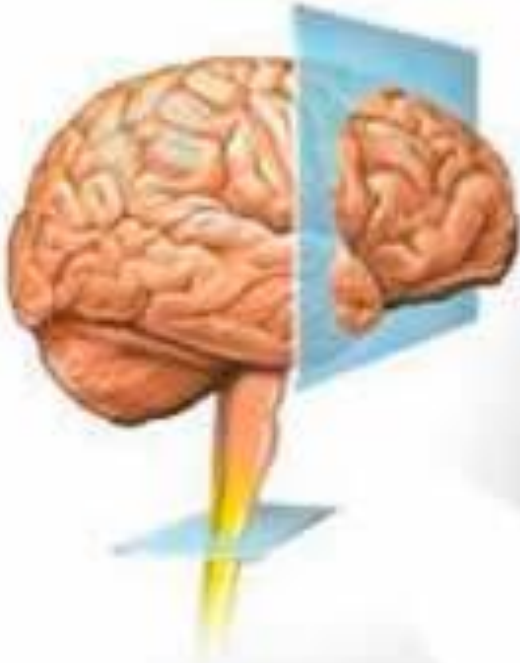
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# THE PROBLEM OF MULTIPLE

Sclerotic plaques of different sizes that have arisen as a consequence of autoimmune damage to the white matter of the brain and spinal cord



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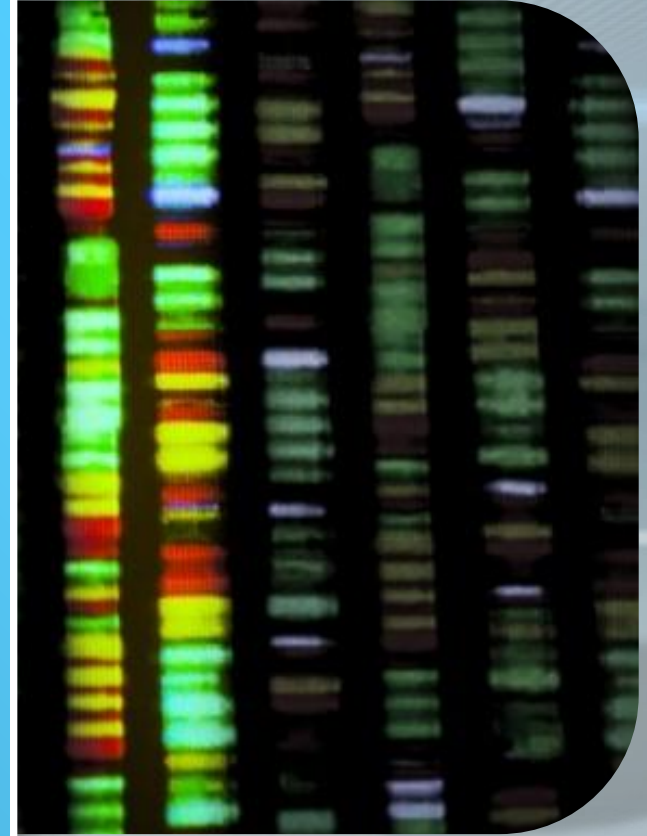


## ETIOLOGY

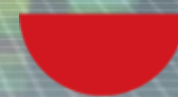
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# THE PROBLEM OF MULTIPLE

The etiology of MS and the pathological mechanism of demyelination is not completely clear.



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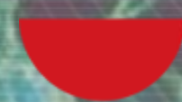
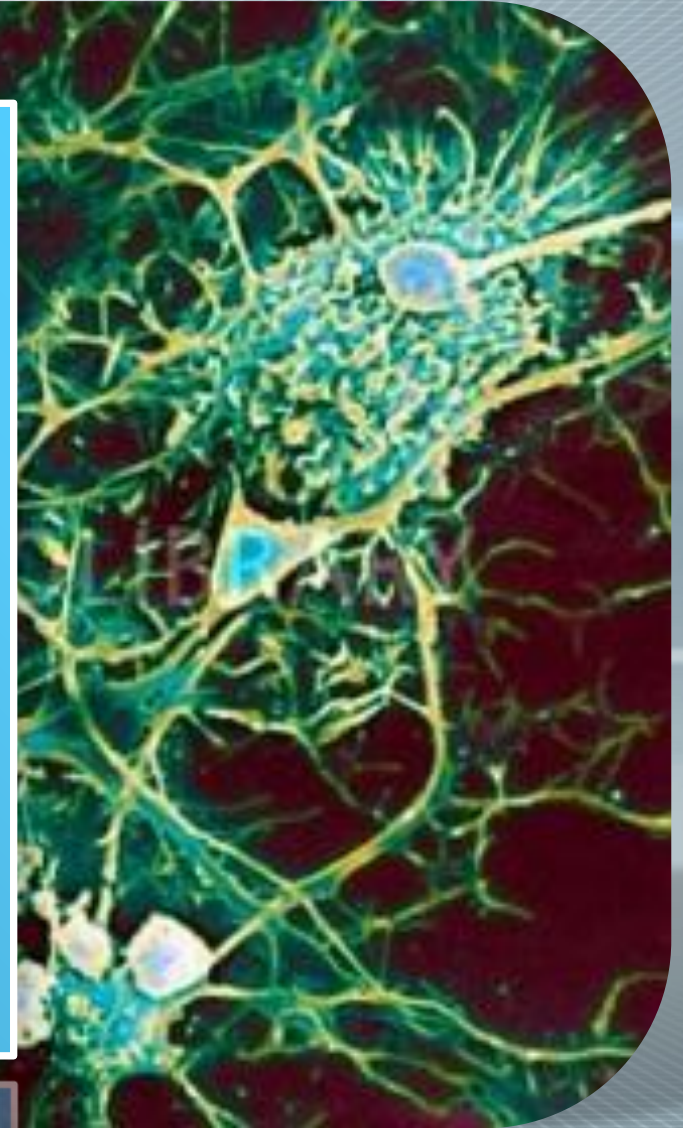


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# THE PROBLEM OF MULTIPLE

Presumably based on genetic predisposition, dysfunction of the immune system autoimmune aggression against myelin producing cells (oligodendrocytes).

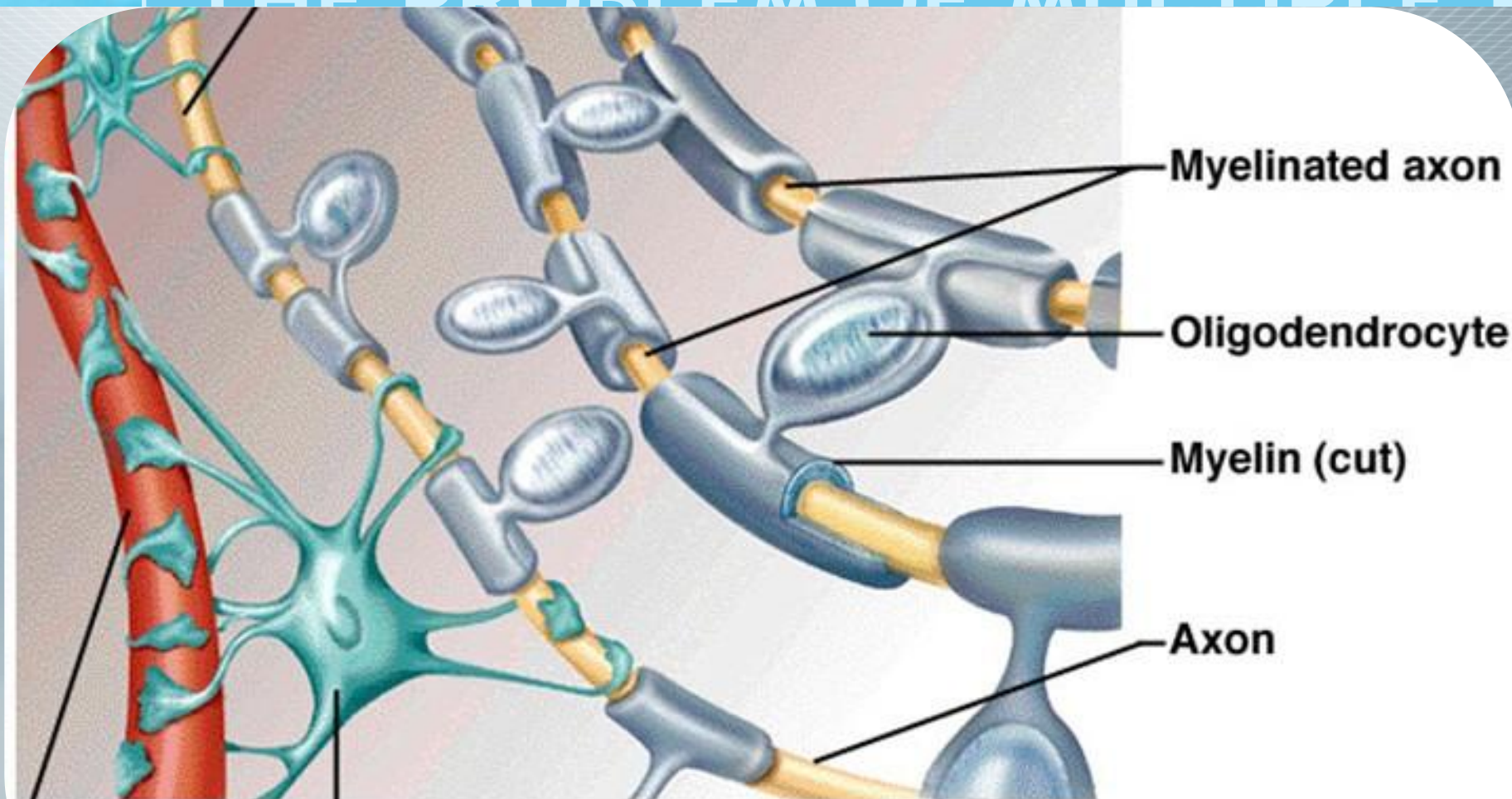


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# THE PROBLEM OF MULTIPLE



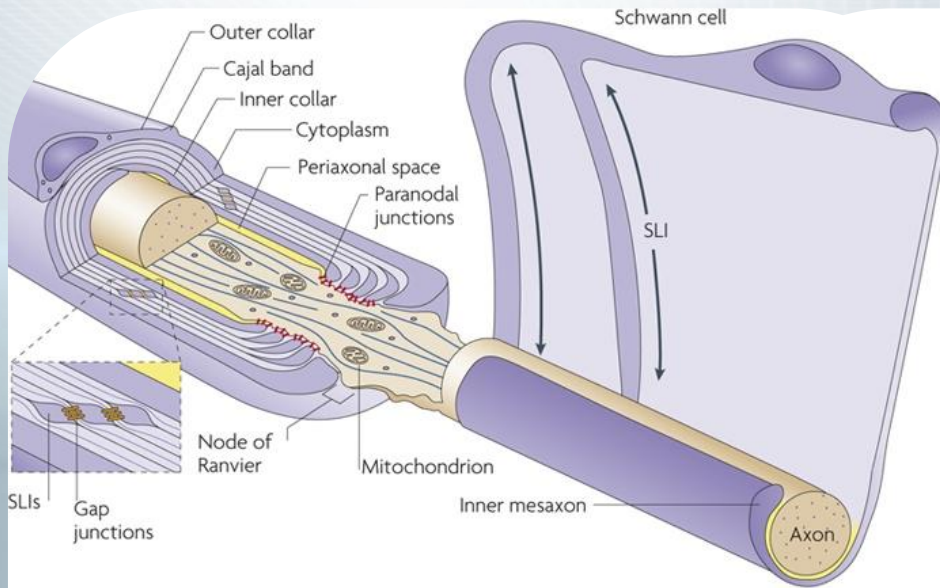
Capillary  
Astrocyte

White matter

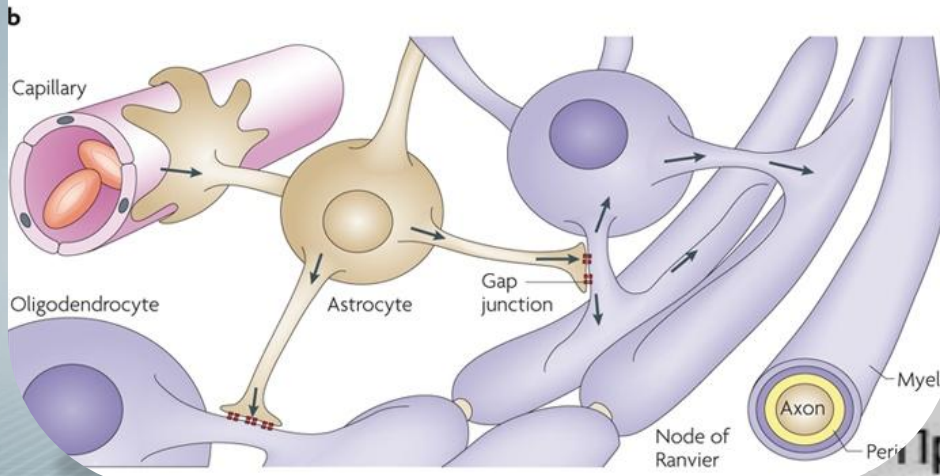
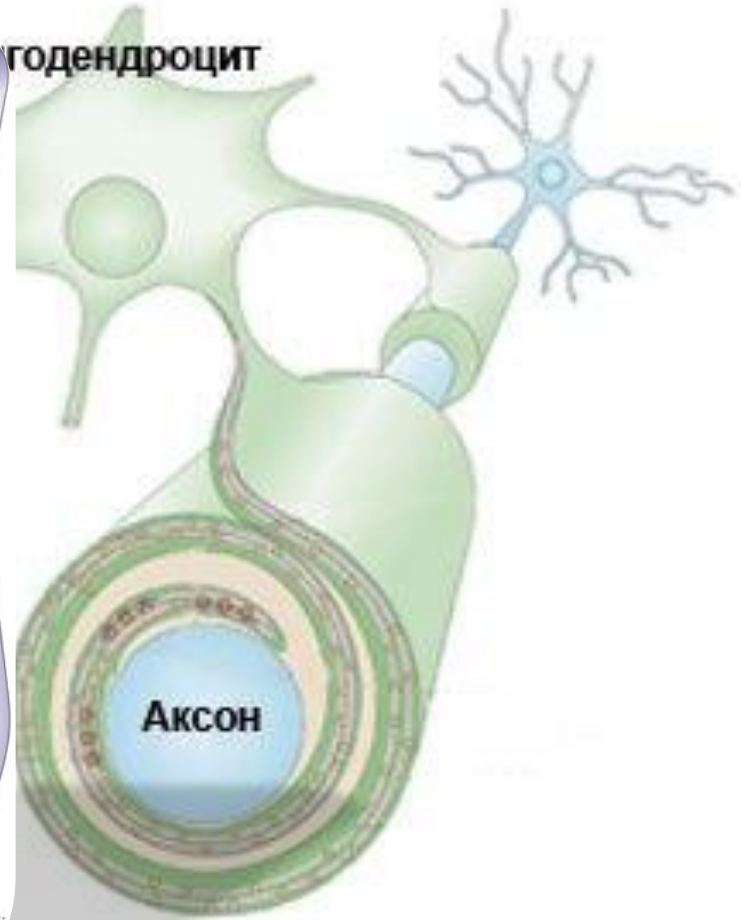
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White matter

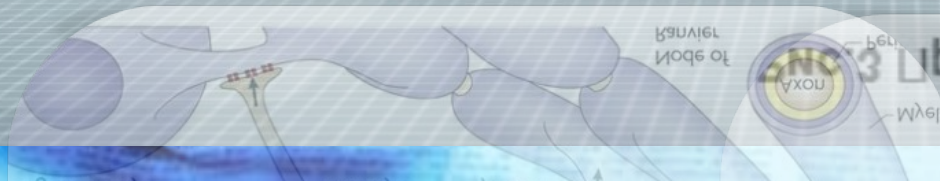
# THE PROBLEM OF MULTIPLE



годендроцит



Процесс миелинизации.



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# THE PROBLEM OF MULTIPLE

The pathogenic substrate is a chronic T cell-induced autoimmune inflammation, in which the body's own immune system attacks the central nervous system.

# THE PROBLEM OF MULTIPLE

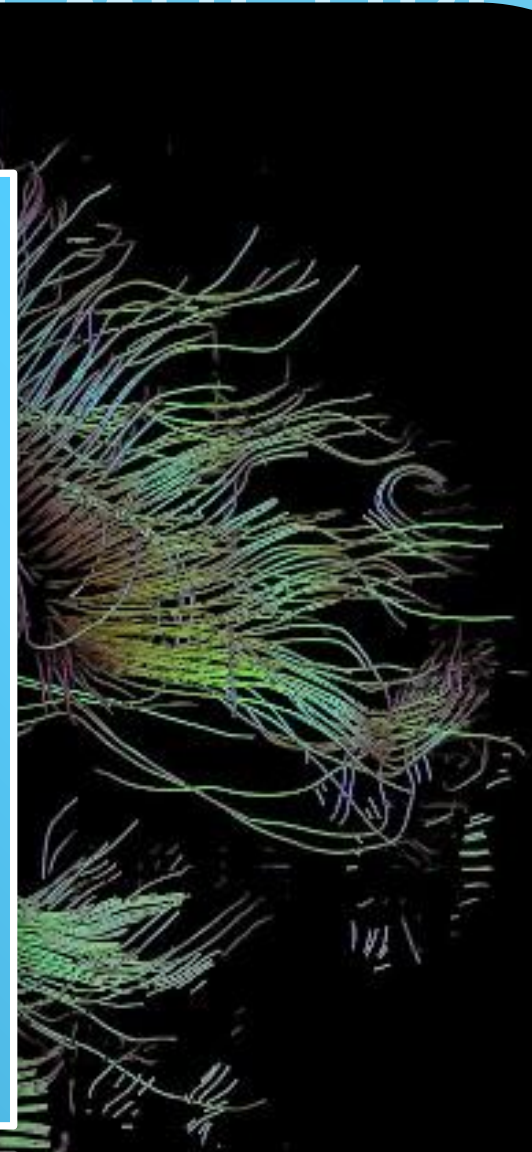
Manifested perivascular infiltration of mononuclear cells, demyelination and axonal damage. Result of diffusion transmission and reactive gliosis.



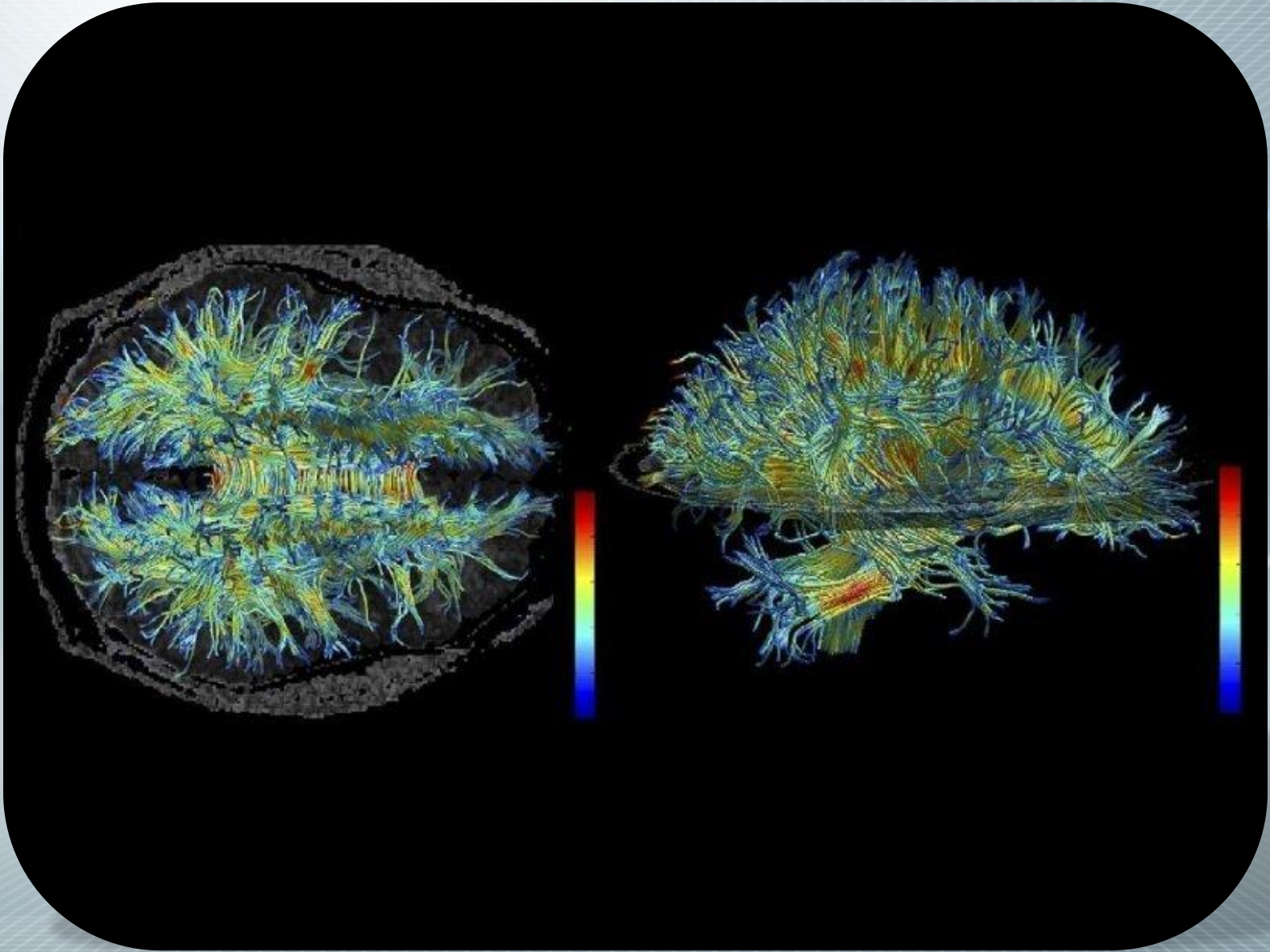
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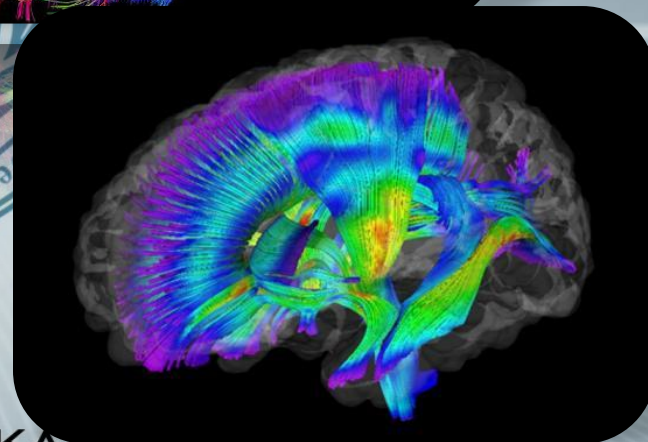
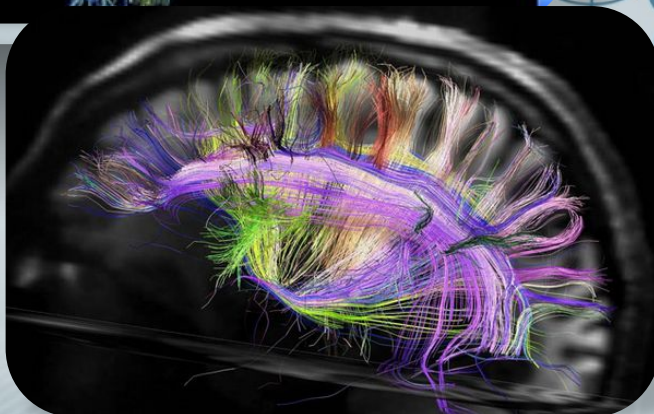
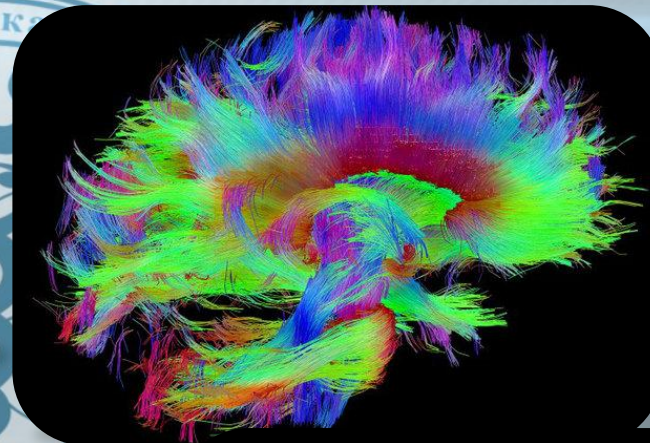
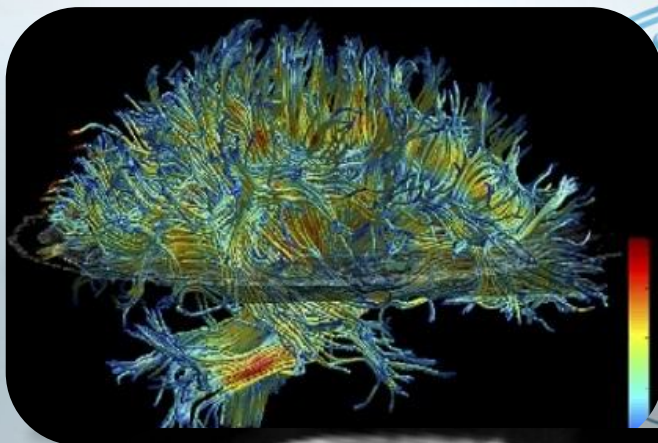
Lots gliosis and demyelination, distributed mainly in the white matter of the central nervous system, radiant crown, cerebellum, brainstem and spinal cord.



# THE PROBLEM OF MULTIPLE



# THE PROBLEM OF MULTIPLE



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# THE PROBLEM OF MULTIPLE

The disease destroys the myelin protein preferably belongs to the structure of the membrane of oligodendrocytes

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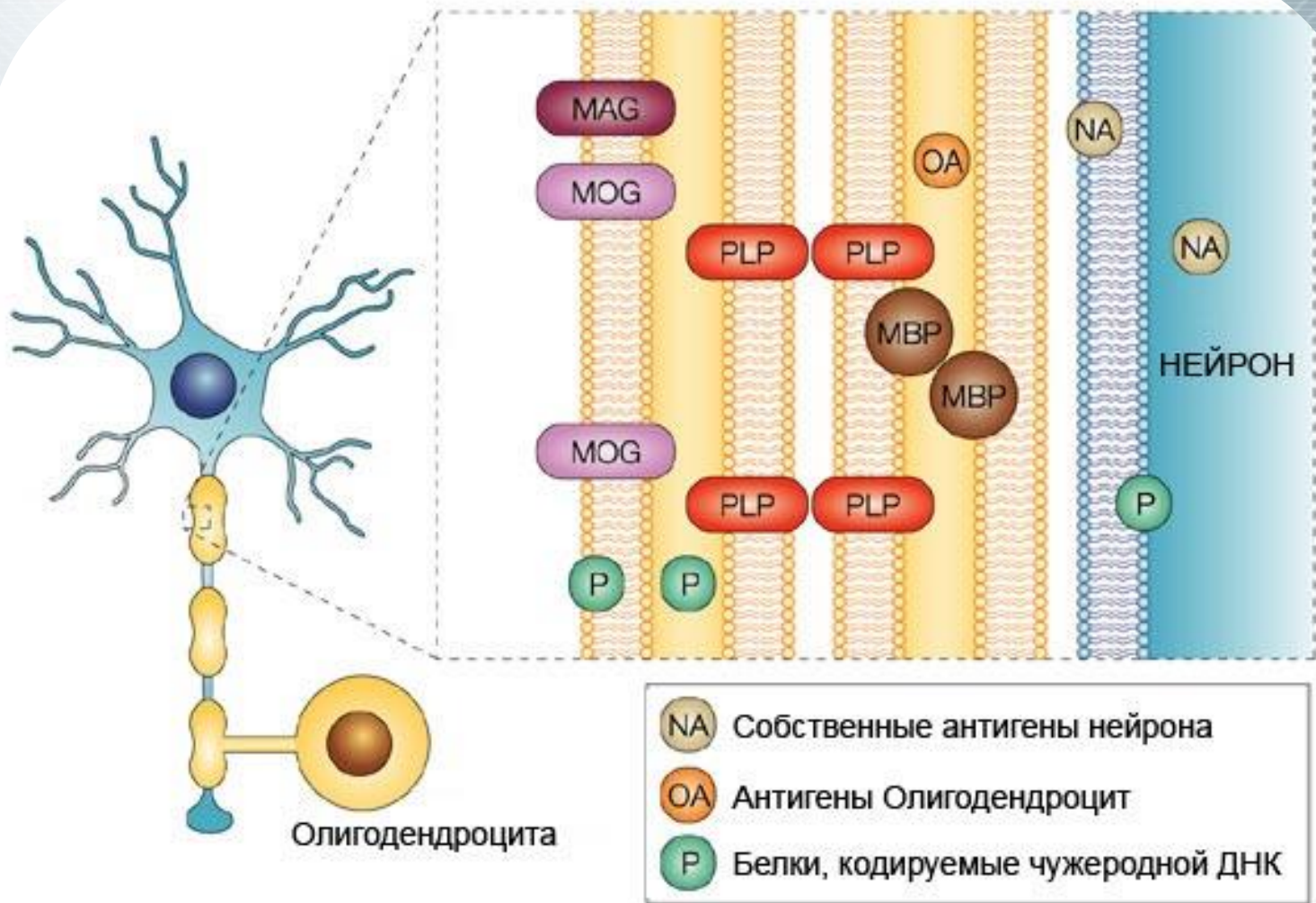


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# THE PROBLEM OF MULTIPLE SCLEROSIS

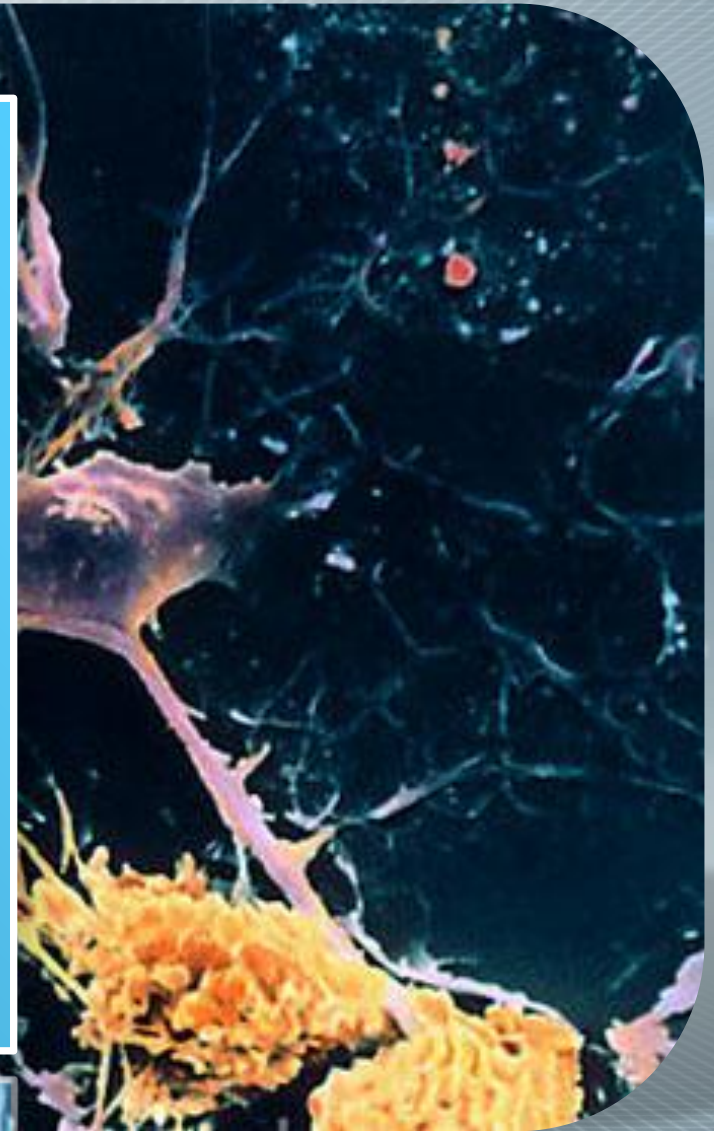


**Рис.8** Белки миелиновой оболочки - мишени (антигены) иммунного ответа при РС

**MAG** - миелин-ассоциированный гликопротеин; **MBP** - основной белок миелина; **MOG** - миелин-олигодендроцитарный гликопротеин; **PLP** - протеолипидный протеин

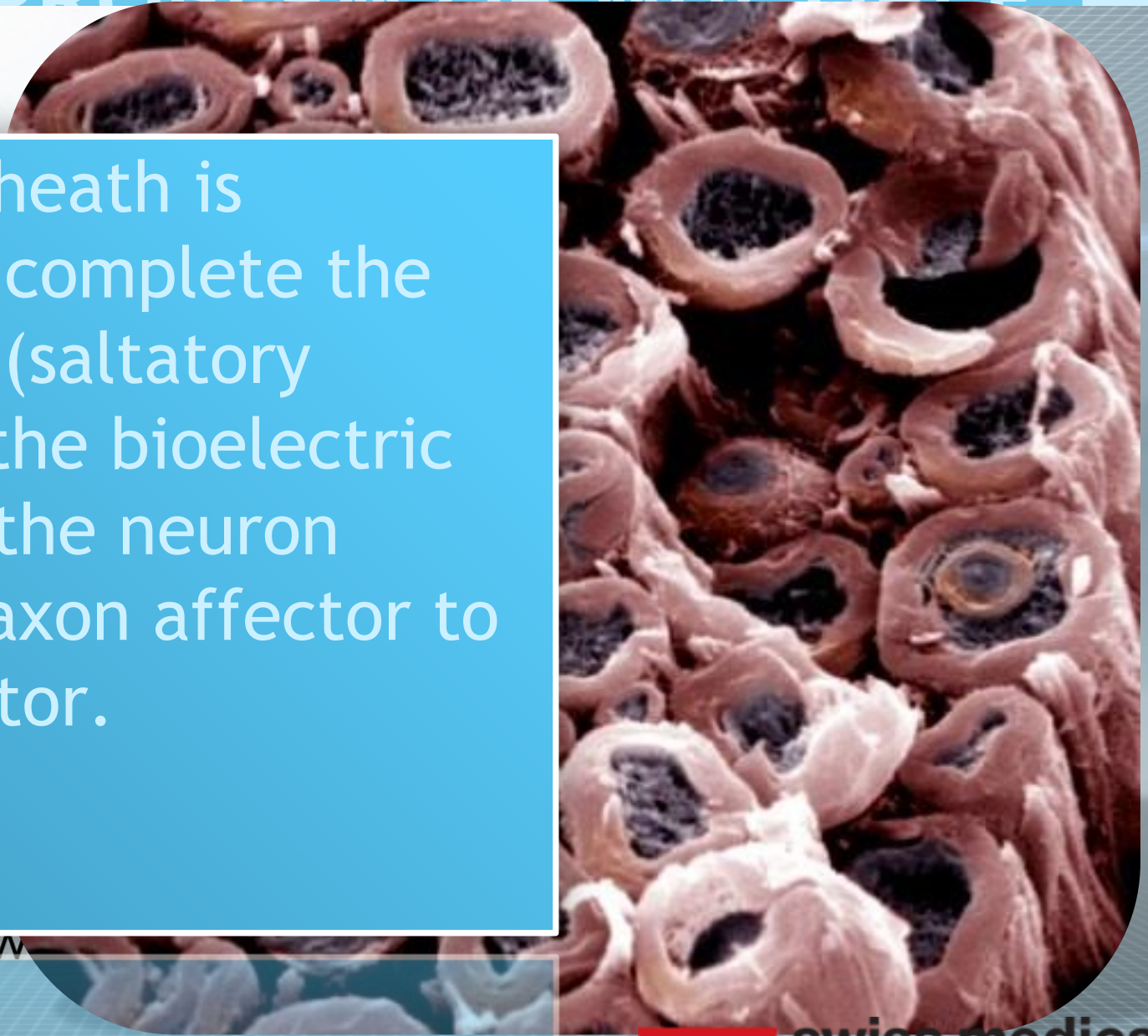
# THE PROBLEM OF MULTIPLE

Oligodendrocytes are specialized glial cells involved in the transmission of nerve impulses and gain by which neurons communicate.



# THE PROBLEM OF MULTIPLE

The myelin sheath is necessary to complete the transmission (saltatory conducting) the bioelectric signals from the neuron through the axon affector to neuron effector.

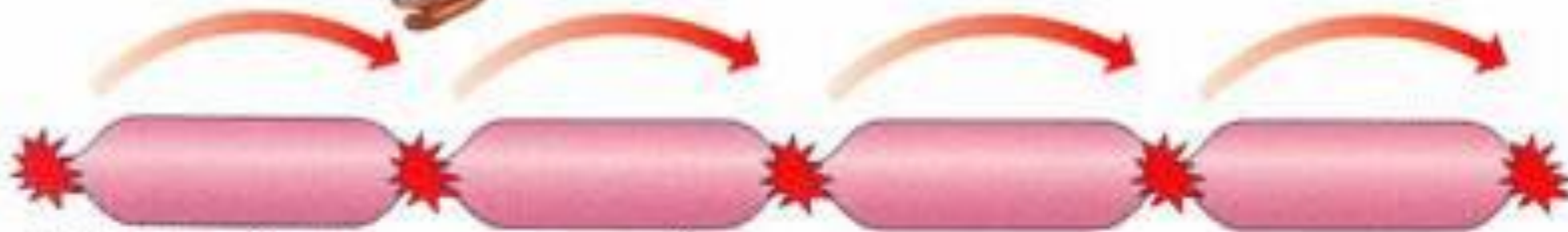


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# THE PROBLEM OF MULTIPLE



Сообщение передается очень быстро  
(со скоростью около 400 км/час)



Нормальный нерв – миелиновая оболочка не повреждена



Сообщение передается медленно (скорость около 4 км/час)



Поврежденный нерв – миелиновая оболочка повреждена или разрушена

поврежденный нерв – миелиновая оболочка повреждена или разрушена

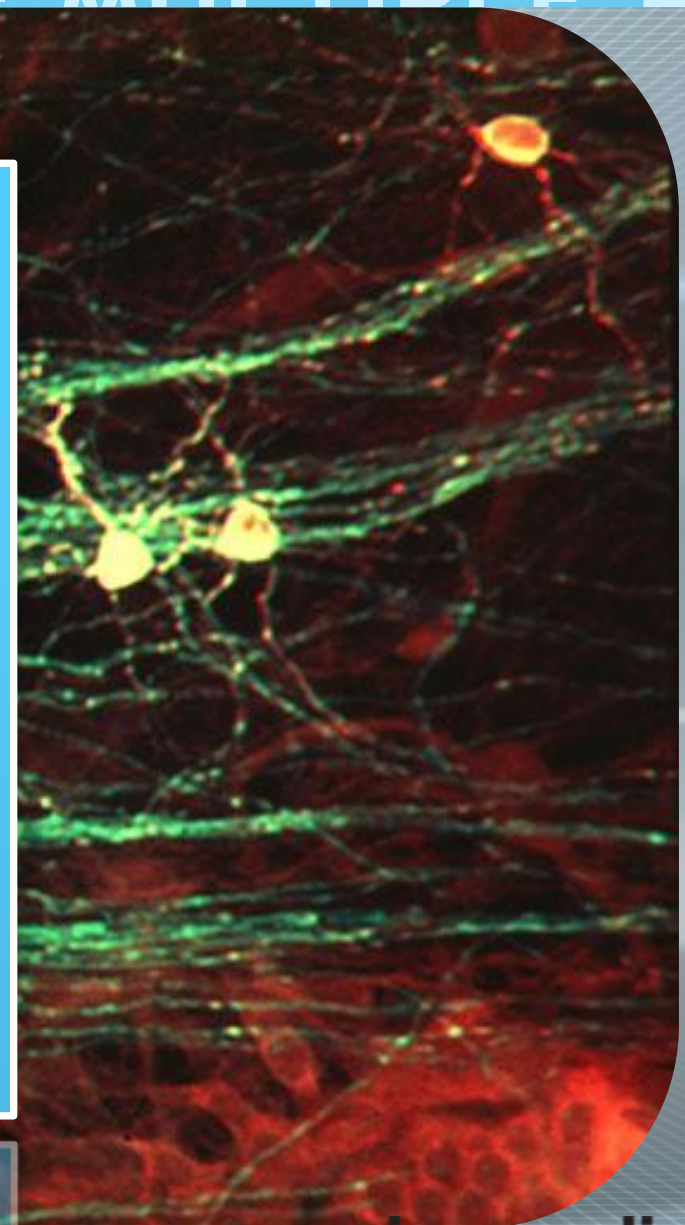


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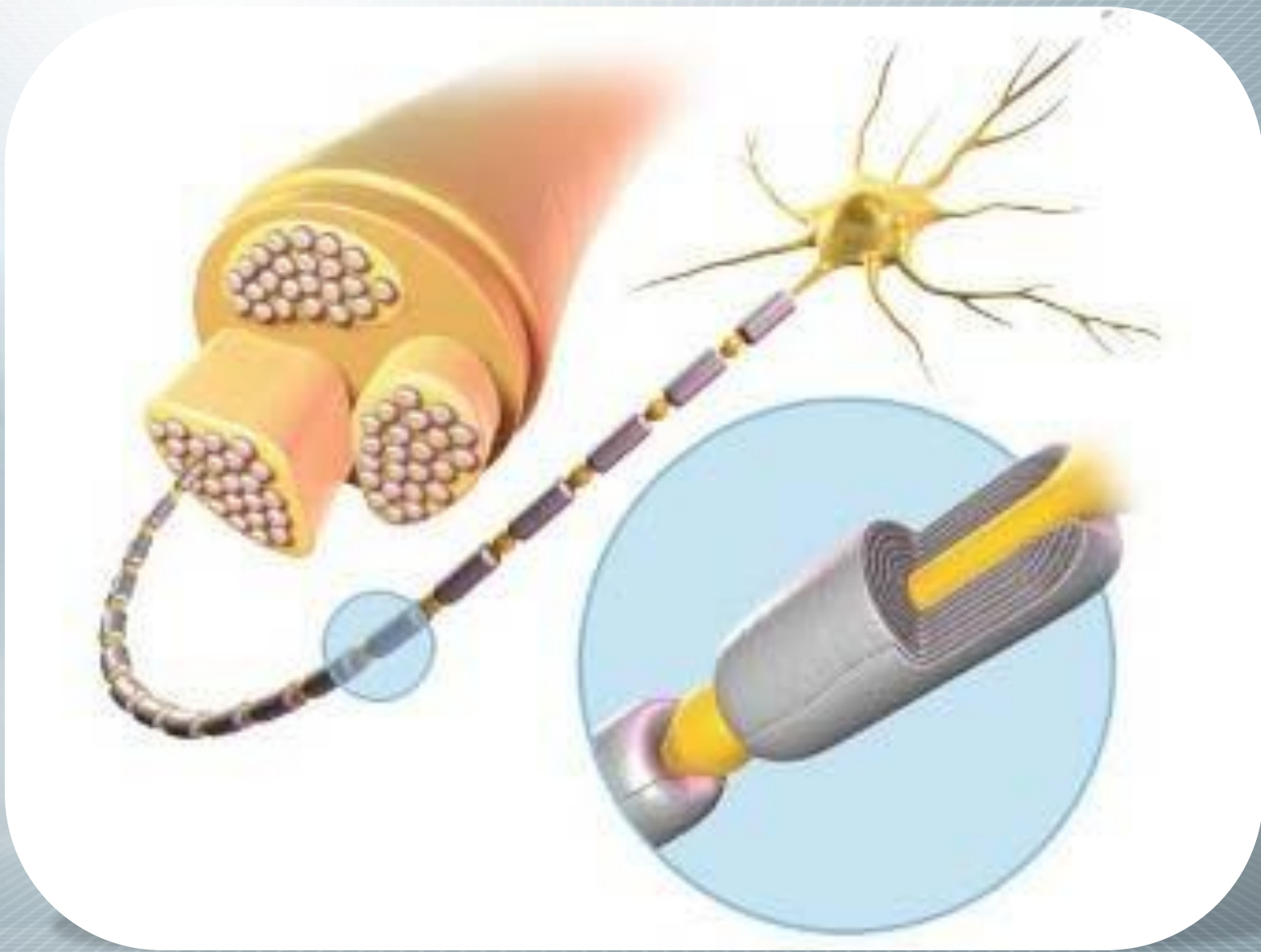
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# THE PROBLEM OF MULTIPLE SCLEROSIS

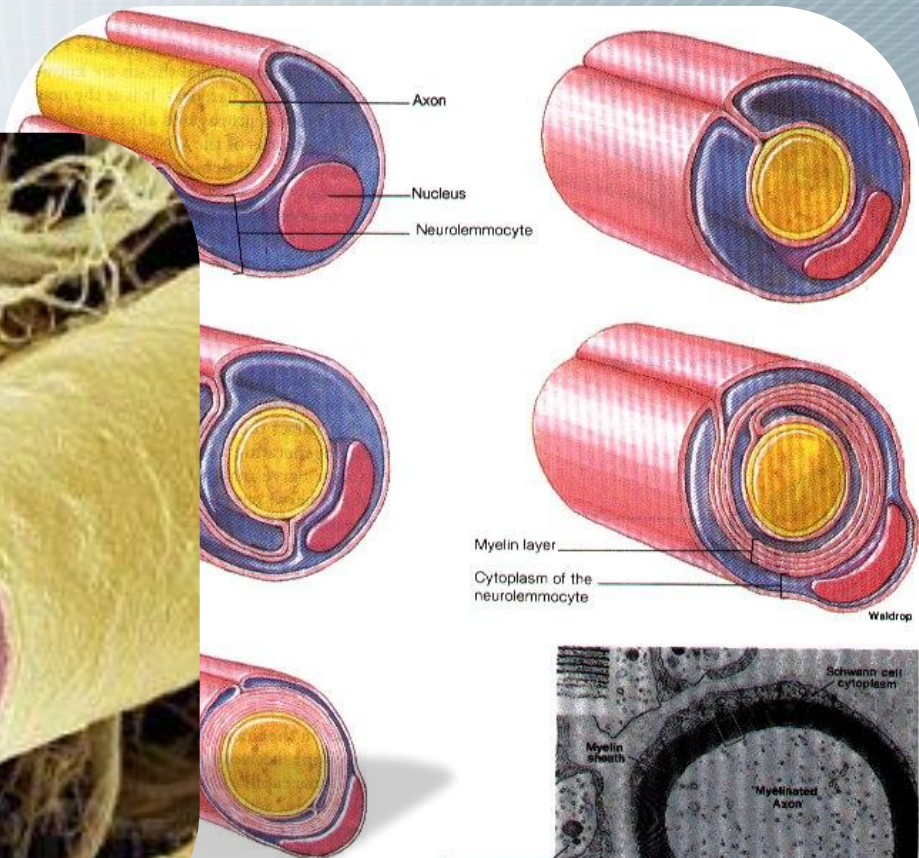
The destruction of the myelin sheath leads to partial or complete blockade of the nerve impulse which leads to clinical manifestations of multiple sclerosis.



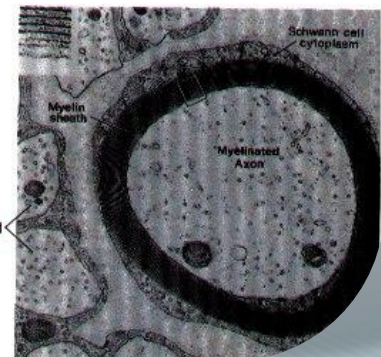
# THE PROBLEM OF MULTIPLE



# THE PROBLEM OF MULTIPLE



(b)  
(p)



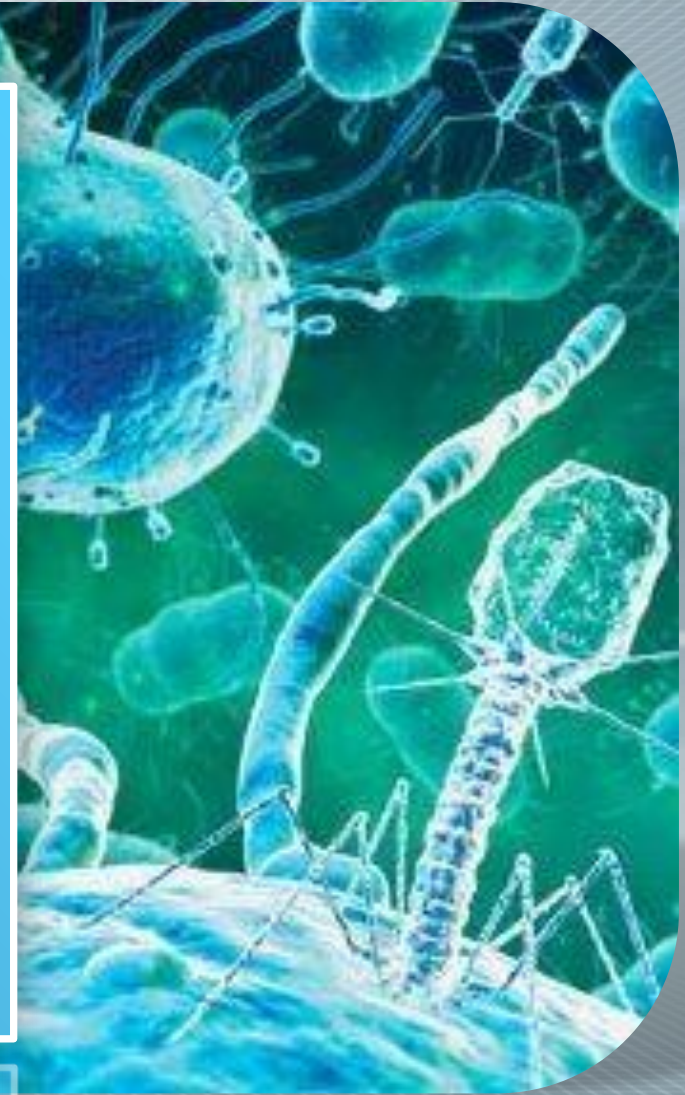
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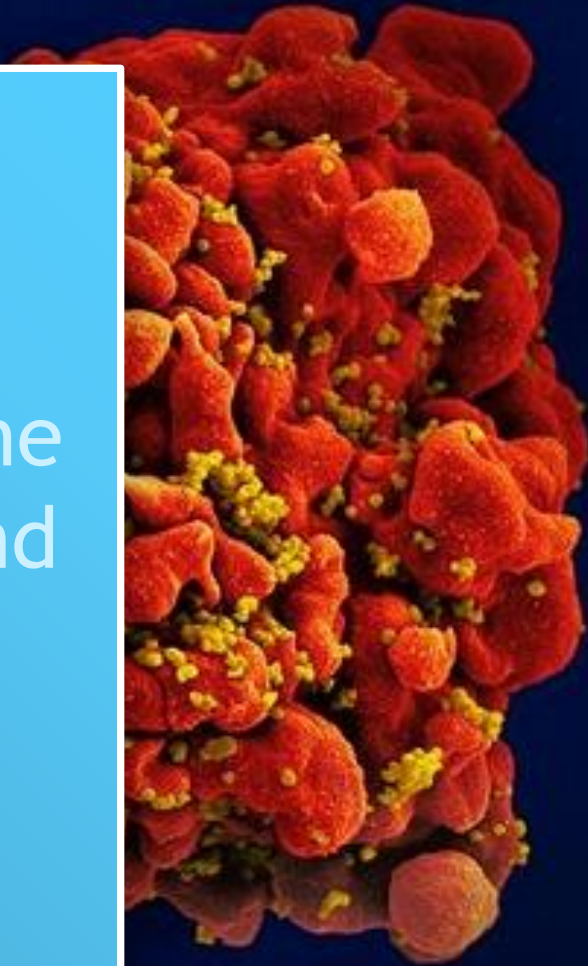
# THE PROBLEM OF MULTIPLE

Important role in the failure of immunity given to heredity, environmental factors and infections.





These factors according to various studies have a leading role in the development of autoimmune aggression to the myelin and oligodendrocytes.



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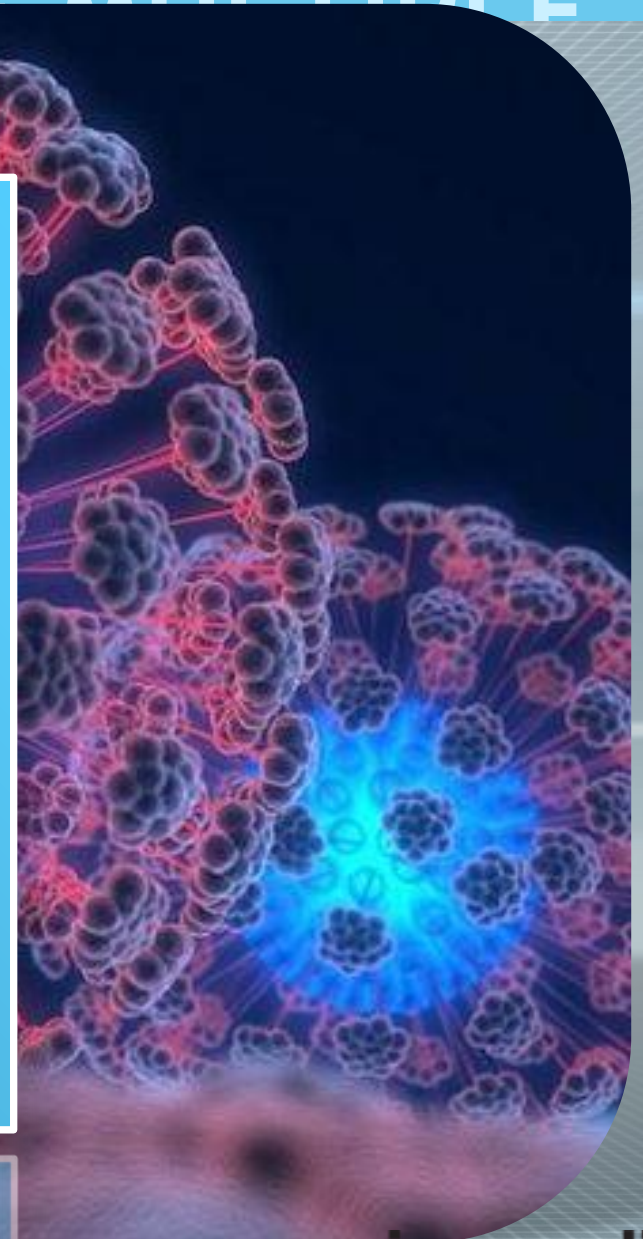


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# THE PROBLEM OF MULTIPLE

Also, some researchers play a key role in the development of autoimmune process, Epstein-Barr virus.



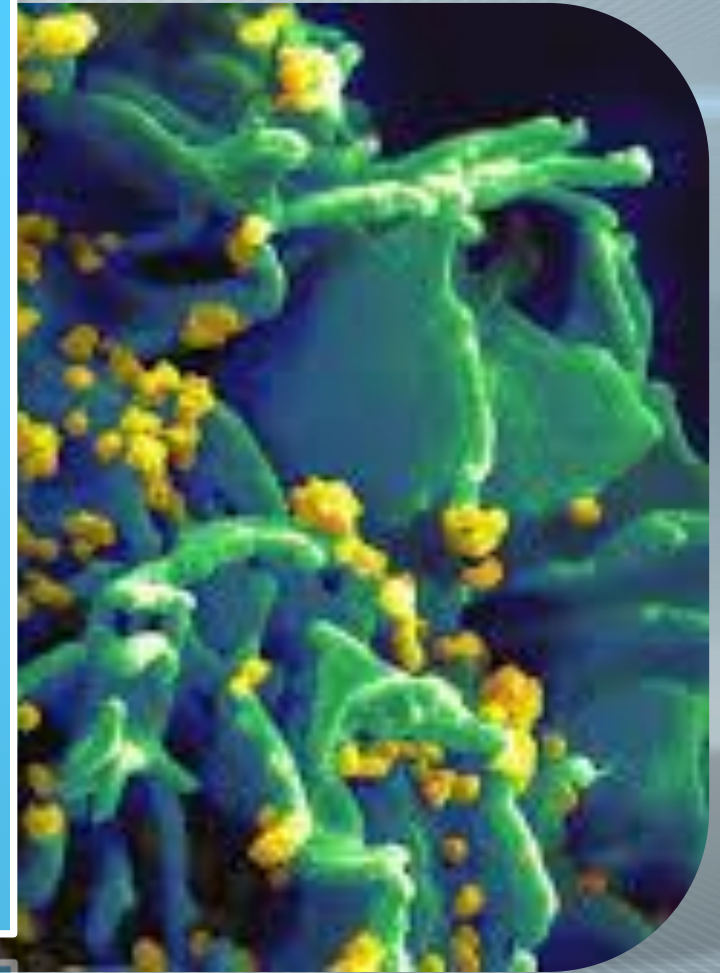
# THE PROBLEM OF MULTIPLE



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# THE PROBLEM OF MULTIPLE

The virus enters the body in early childhood and persists for a long time manifests infectious mononucleosis or suspected autoimmune demyelination.



# THE PROBLEMS OF MULTIPLE



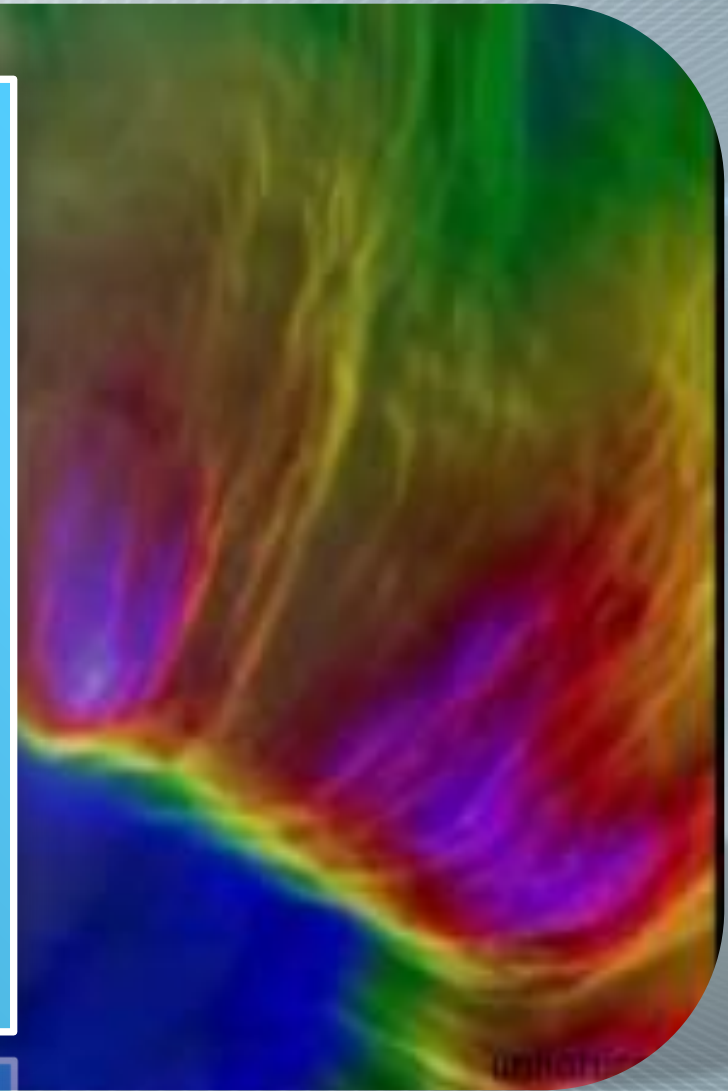
# THE PROBLEM OF MULTIPLE

Also noted the key patterns of response of the organism to various environmental influences.



# THE PROBLEM OF MULTIPLE SCLEROSIS

In particular, patients with multiple sclerosis showed a decrease tolerance to the effects of solar radiation and ultraviolet radiation.



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# THE PROBLEM OF MULTIPLE

Vitamin D deficiency, smoking tobacco may be additional triggers the development of multiple sclerosis



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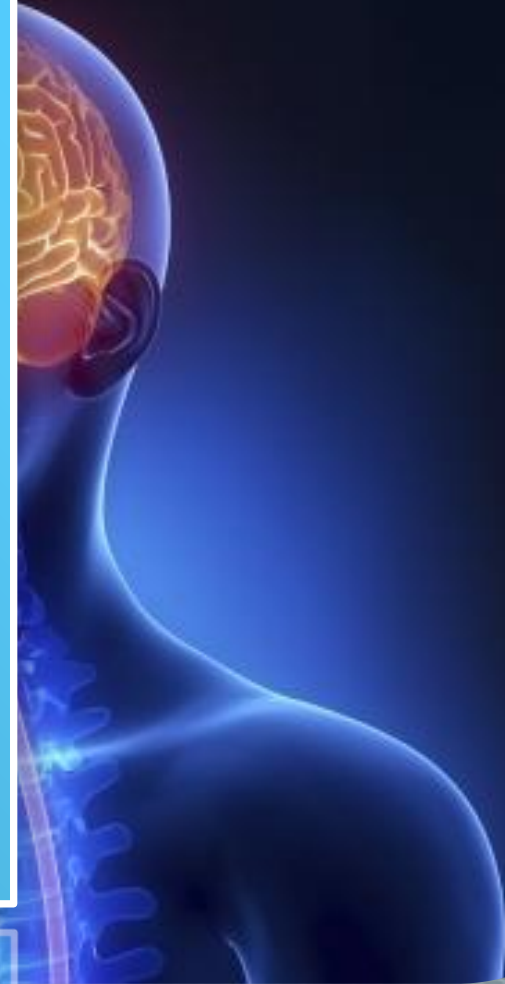




## EPIDEMIOLOGY

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Multiple sclerosis is the most common autoimmune disease affecting the central nervous system.



# THE PROBLEM OF MULTIPLE SCLEROSIS

The statistics for 2008 show that MS suffer from 2 to 2.5 million people in the entire population of the world in its various climate zones, often in northern latitudes.

Distribution of Multiple Sclerosis



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# THE PROBLEM OF MULTIPLE

There was a statistically upward trend in the incidence of MS. In 2013, 20,000 people died because of the DS.

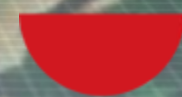
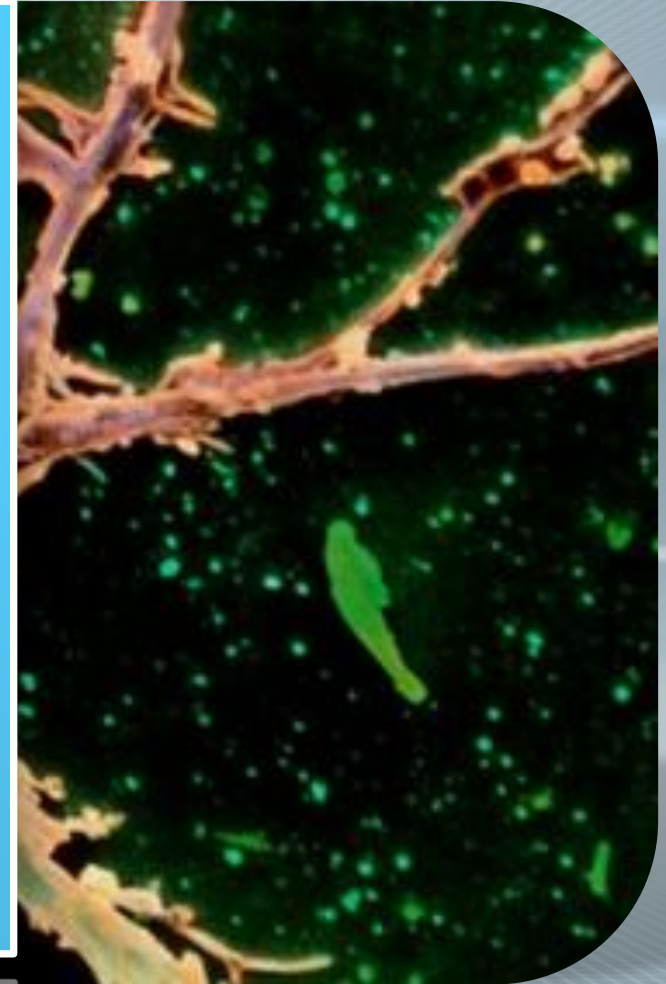
# THE PROBLEM OF MULTIPLE

At the same time in 1990  
such cases were registered in  
12000.



# THE PROBLEM OF MULTIPLE

The disease usually debuts at the age of 20 to 50 years. Most earlier age groups.



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# THE PROBLEM OF MULTIPLE

Women suffer from MS almost twice as often as men. The life expectancy of an average of 5 to 10 years lower than that of the healthy population.



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# THE PROBLEM OF MULTIPLE



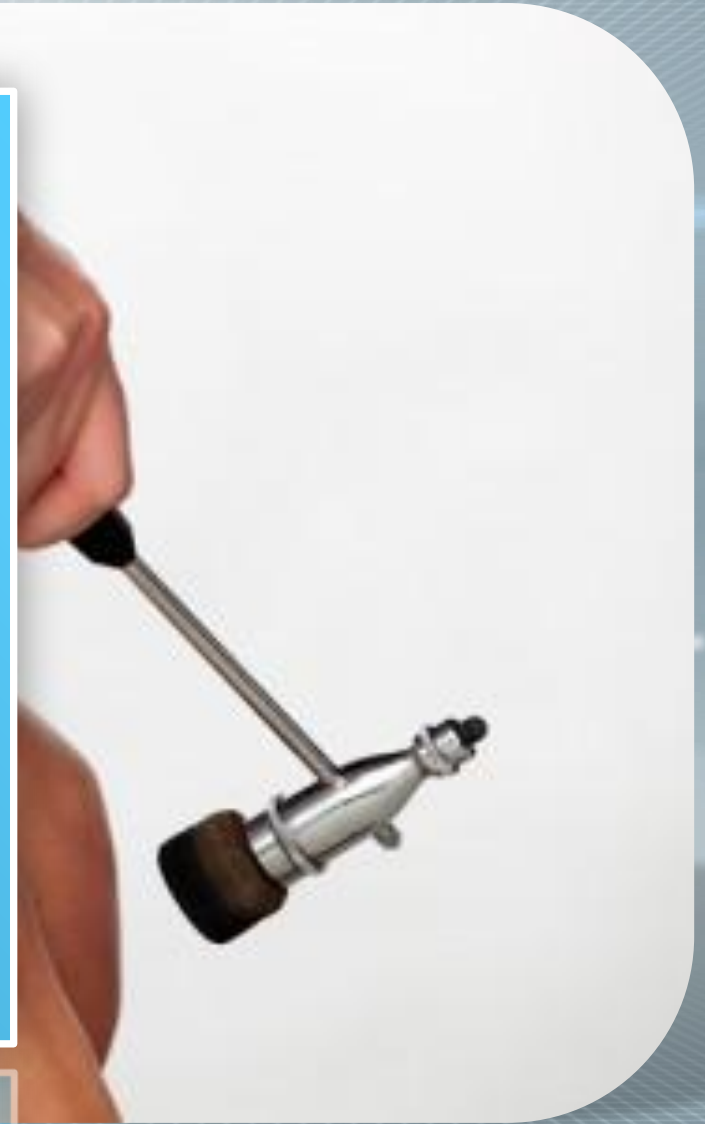
## DIAGNOSTICS

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# THE PROBLEM OF MULTIPLE

For the diagnosis of multiple sclerosis requires a detailed medical history, a thorough neurological examination with the use of special tests and procedures.



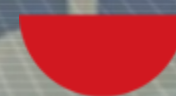
# THE PROBLEM OF MULTIPLE

Field selection of clinical symptoms and combining them into syndromes exhibit a preliminary diagnosis of the possible presence of demyelination.



# THE PROBLEM OF MULTIPLE

To confirm the clinical apperception apply additional methods of diagnostics tools such as brain imaging, magnetic resonance imaging

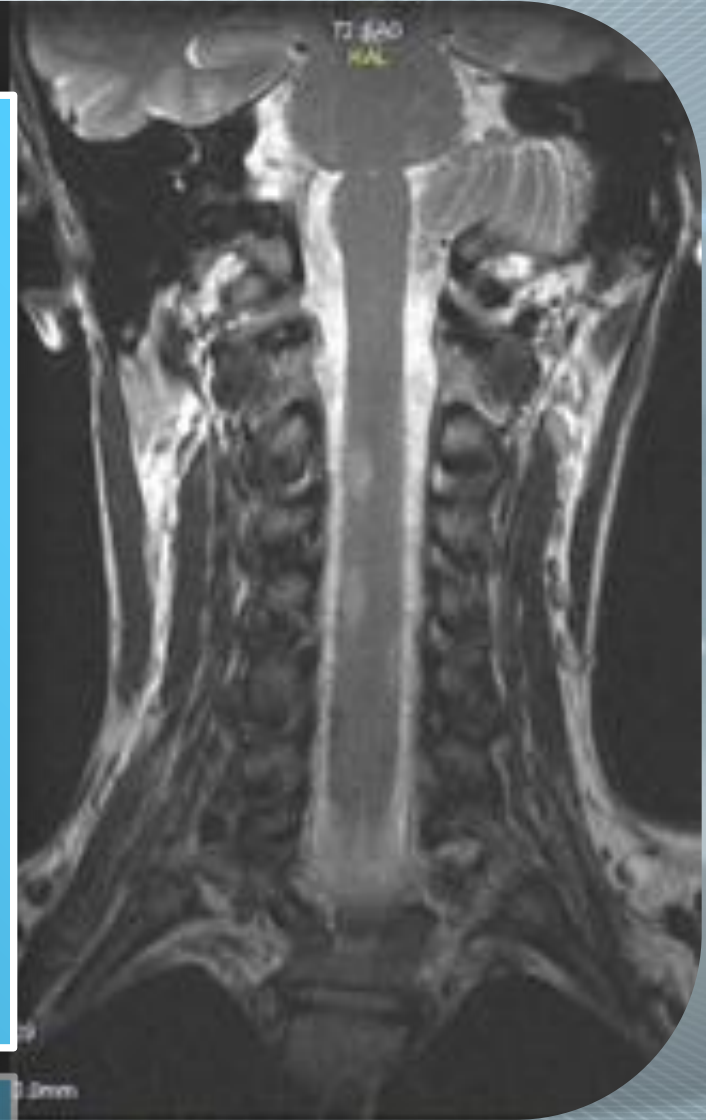


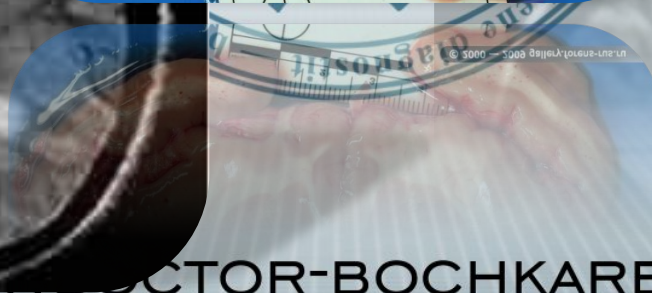
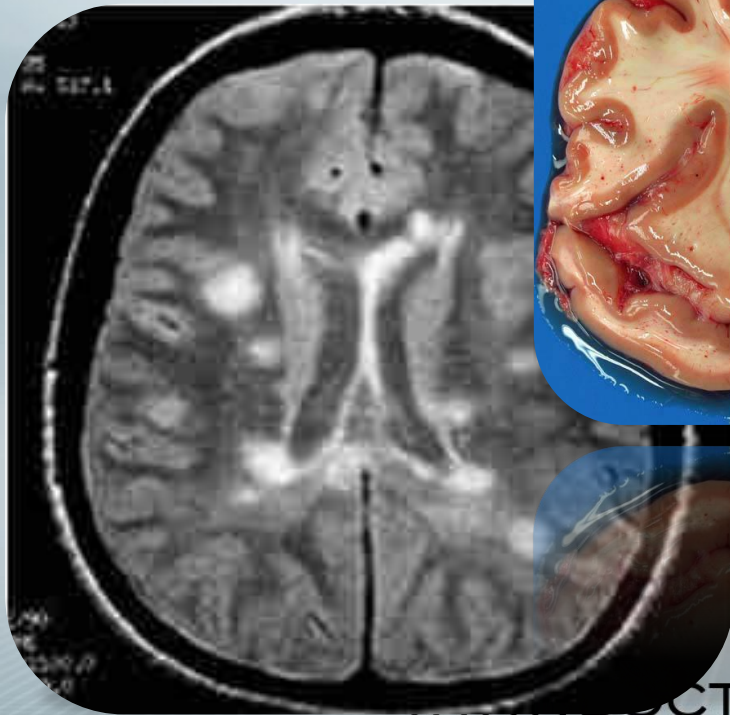
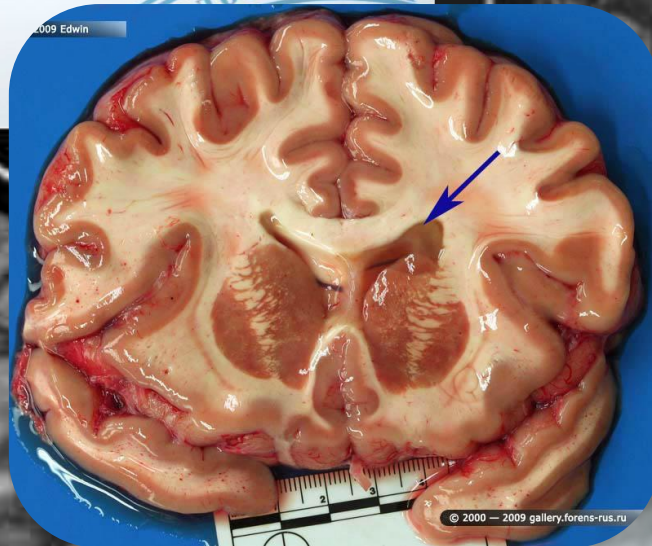
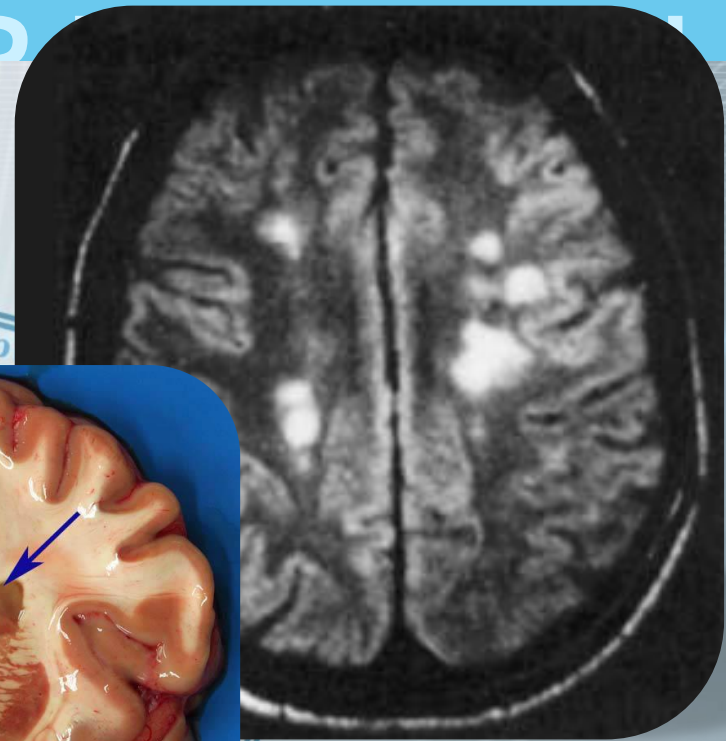
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# THE PROBLEM OF MULTIPLE

MRI study demyelinating program (FLAIR - mode, T1-T2-weighted images, etc.





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# THE PROBLEM OF MULTIPLE

Then, a lumbar puncture and cerebrospinal fluid obtained is investigated for the presence of Monoclonal antibodies to myelin basic protein.



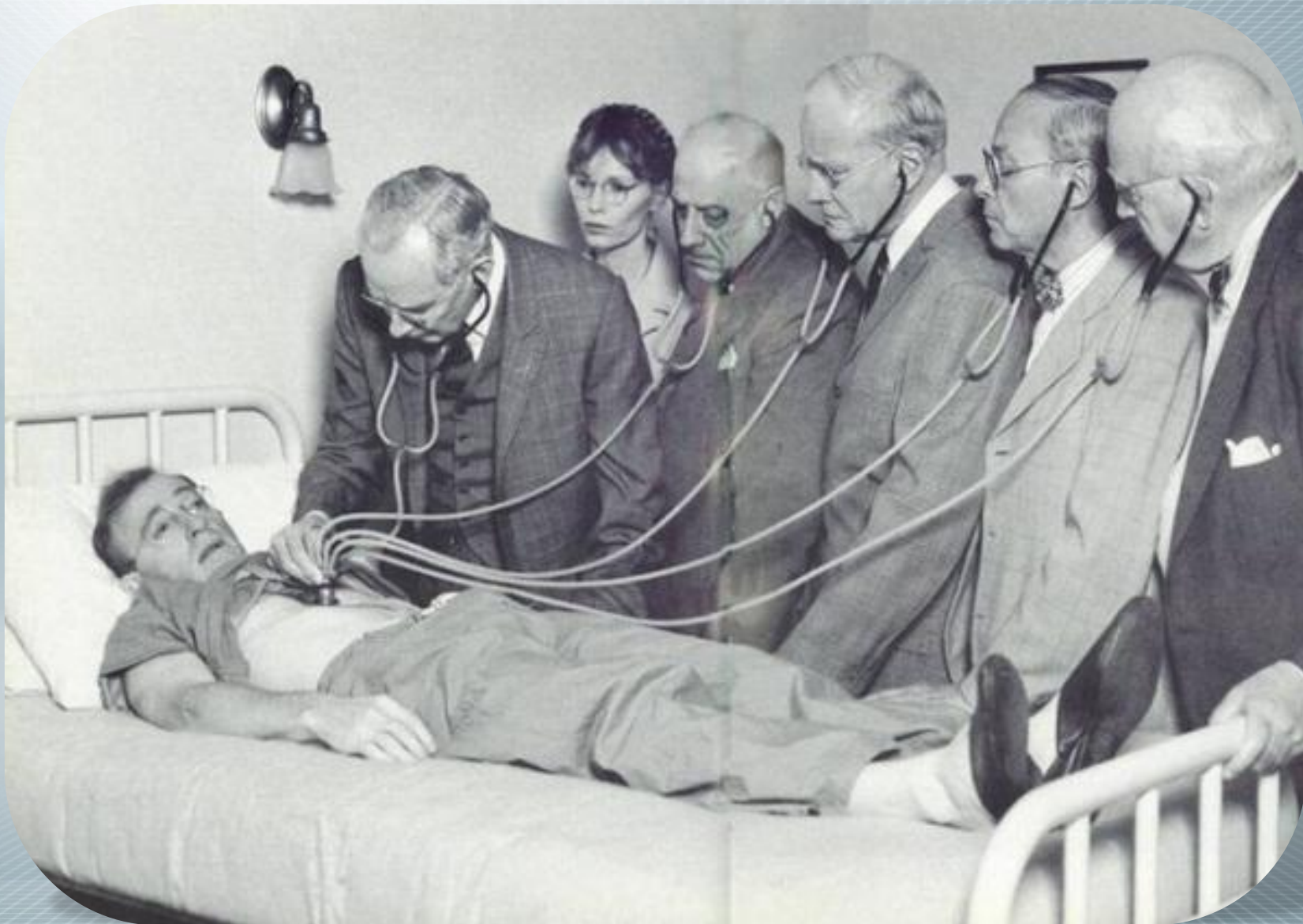
# THE PROBLEM OF MULTIDISCIPLINARY

For a more precise characterization of the demyelinating process of the CNS, it is necessary to resort to additional consultations related to the diagnosis of the disease from professionals such as a psychiatrist, an immunologist.



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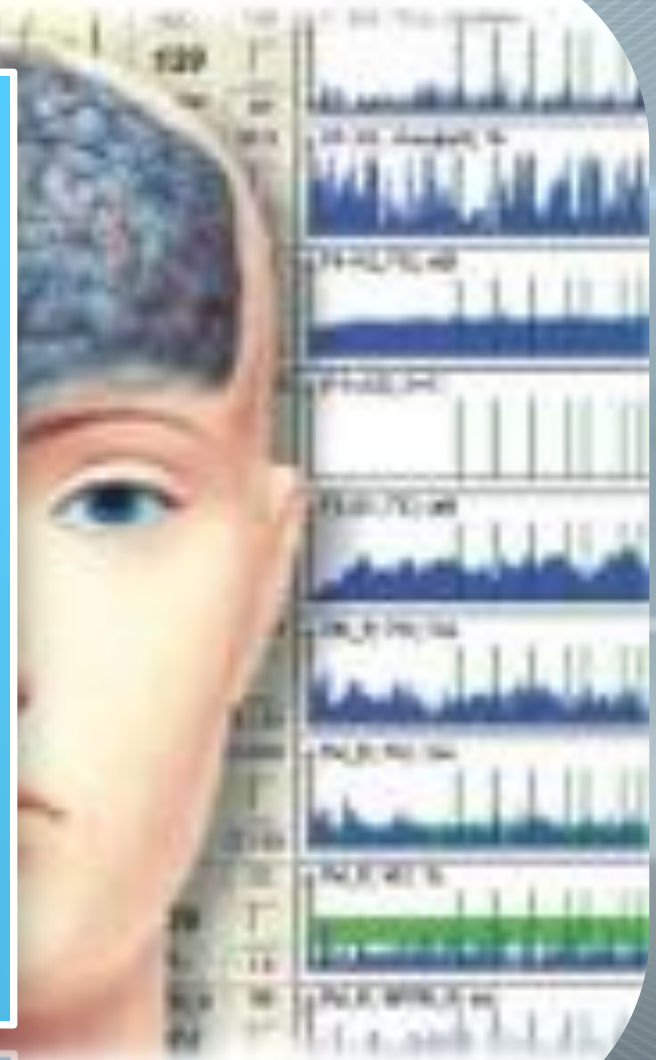
# THE PROBLEM OF MULTIPLE





# THE PROBLEM OF MULTIPLE

Neurophysiological research methods can be quite informative, even at the early onset of the disease, a specific role for electroencephalography (EEG) and the resulting potentials.



# THE PROBLEM OF MULTIPLE

Progression of the disease leads to permanent disability, motor, sensory, mental and cognitive disorders.



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# THE PROBLEM OF MULTIPLE



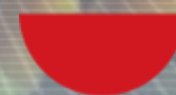
## TREATMENT

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Treatment of multiple sclerosis are not currently found.



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# THE PROBLEM OF MULTIPLE

Until the end is not clear pathophysiological mechanism of occurrence of the system demyelination. For this reason, it has not yet developed etiopathogenetic treatment.



However, modern medical science allows for effective palliative and symptomatic therapy.



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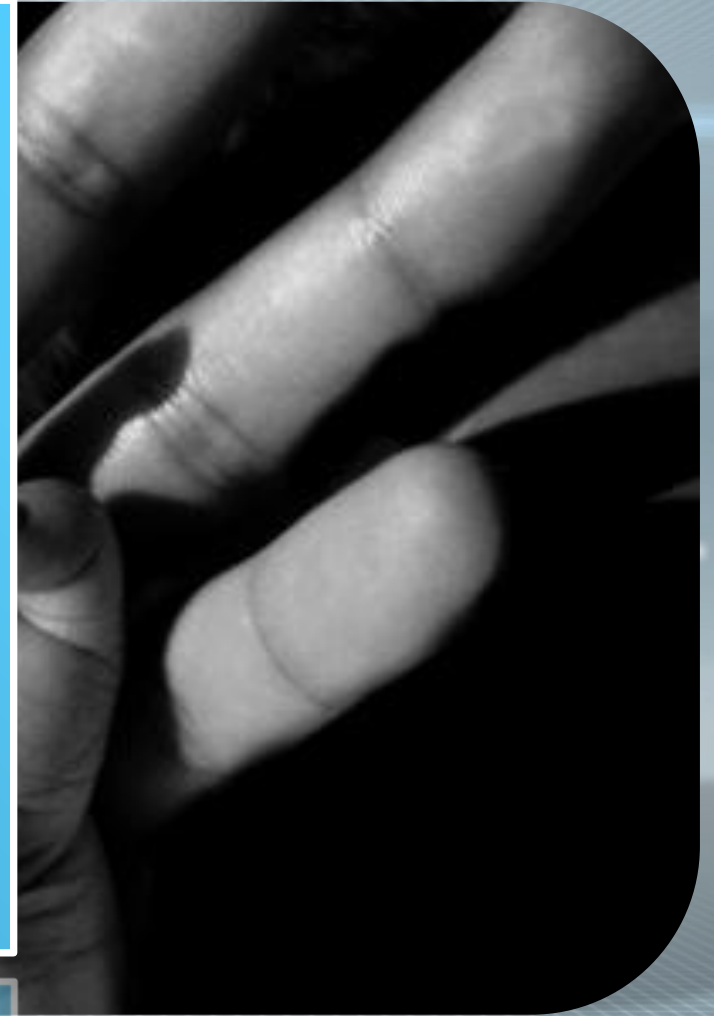
# THE PROBLEM OF MULTIPLE

Designed and tested international standards of treatment that aimed at improving the quality of life of patients and facilitate the elimination of symptoms.



# THE PROBLEM OF MULTIPLE

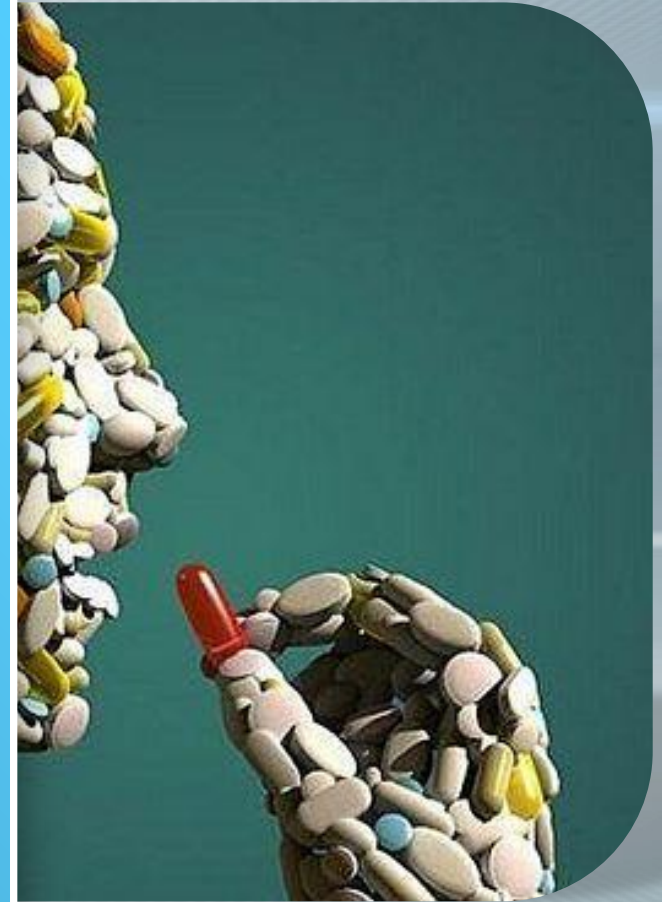
Strategic effect of therapy aims at reducing the recurrence of, reducing the number of attacks, increased longevity of patients.





# THE PROBLEM OF MULTIPLE

For these purposes at the current time successfully passed clinical trials and actively introducing modern medicines.



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# THE PROBLEM OF MULTIPLE

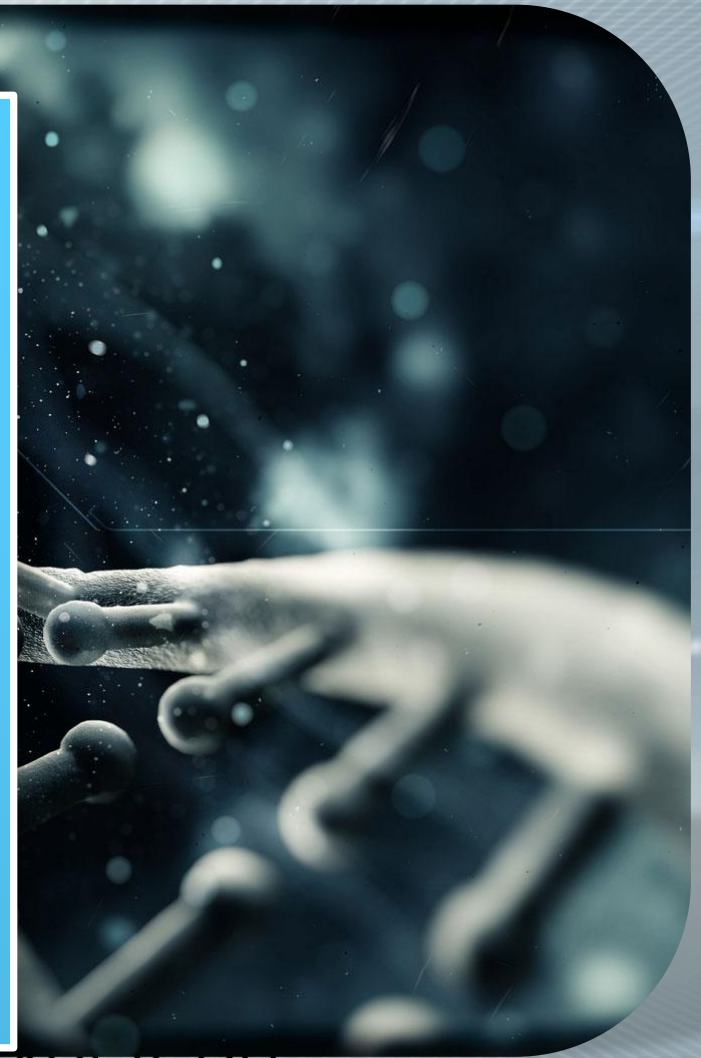
Treatment algorithms, individual approach to reparative regeneration and physiotherapy rehabilitation of patients with multiple sclerosis.



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# THE PROBLEM OF MULTIPLE

Tested and implemented new cutting-edge biotech treatments. Studies conducted in the field of regenerative medicine using stem cells and other bioengineering technology



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# THE PROBLEM OF MULTIPLE

Of the currently available therapies advantageously used selective inhibition of autoimmune attack against the nervous system.



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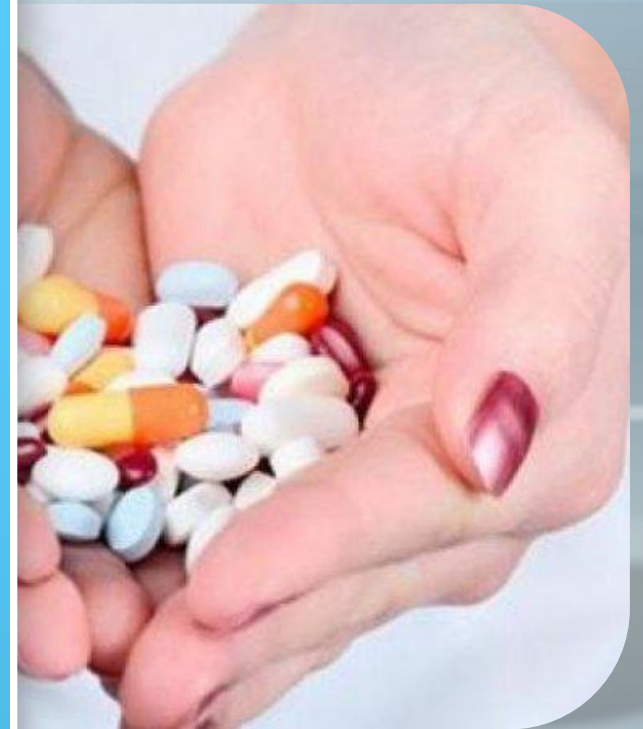


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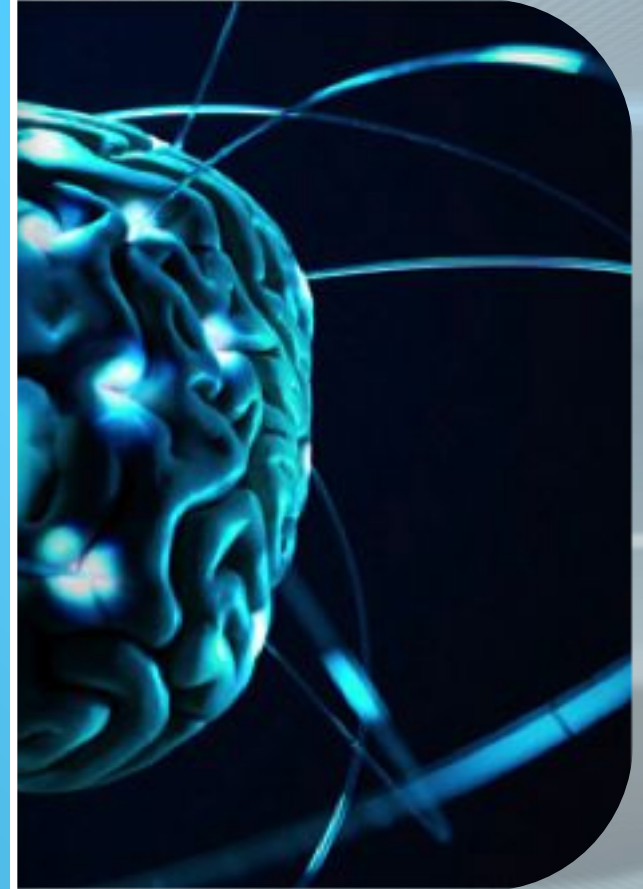
# THE PROBLEM OF MULTIPLE

Used interferons, glucocorticoid hormones, various immunosuppressants including plasmapheresis. However, their use does not promote the regeneration of damaged myelin fibers previously

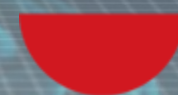


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The therapy is aimed primarily improve lost function after CNS demyelinating attack, and to prevent new attacks.



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# THE PROBLEM OF MULTIPLE

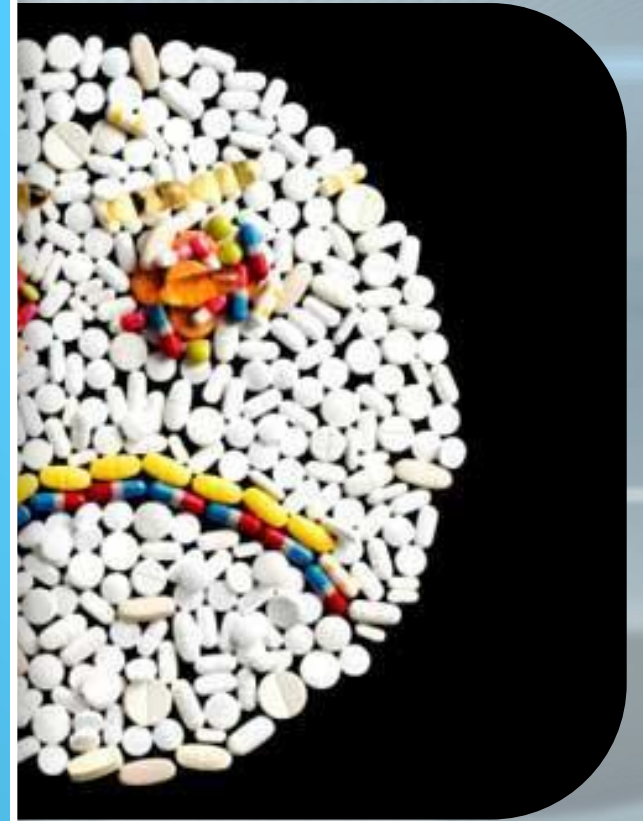
Despite that medicines used to treat MS are ineffective, and usually have significant side effects which have a negative impact.



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# THE PROBLEM OF MULTIDRUG

Poorly tolerated, and vice versa worsen the quality of life of patients.



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# THE PROBLEM OF MULTIPLE

So many people suffer from MS often resort to alternative treatments, despite the lack of credible evidence.



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# THE PROBLEM OF MULTIPLE

One of the most promising methods of treatment of multiple sclerosis is the use of stem cells.



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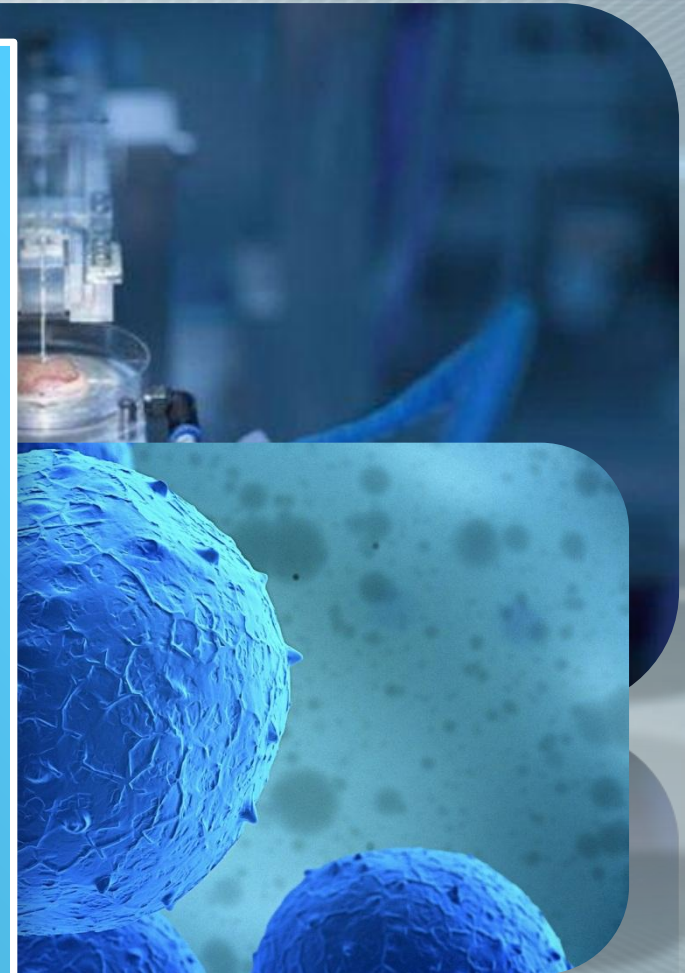


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# THE PROBLEM OF MULTIPLE

Studies on the use in the treatment of MS autologous stem cells show a positive therapeutic effect.



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# THE PROBLEM OF MULTIPLE

Long-term results are difficult to predict good results stem from an alternative method of treatment is more common in women with early onset and recurrent course, too early to start combination therapy.

# THE PROBLEM OF MULTIPLE



## STEM CELL TREATMENT

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# THE PROBLEM OF MULTIPLE

Treatment in Swiss Medica Clinic showed that stromal stem cells administered intravenously cross the blood brain barrier and copy neural stem cell activity.

[Park and Eve, 2009; Galli etc., 2008; Srivastava etc., 2008].



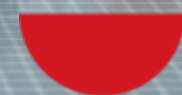
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# THE PROBLEM OF MULTIPLE

This stem cell treatment leads to the replacement of damaged cells and the restoration of the brain function. “In fact, a growing number of reports indicate that adult stem cells have the ability to stimulate the generation of new neurons, oligo-dendrocytes, and astrocytes”

[Park and Eve, 2009; Galli etc., 2008; Srivastava etc., 2008].

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# THE PROBLEM OF MULTIPLE

Until recently, it was believed that damaged brain tissue is permanent condition. Nowadays, the re-growth of brain cells and improvements of neurological function has been documented.

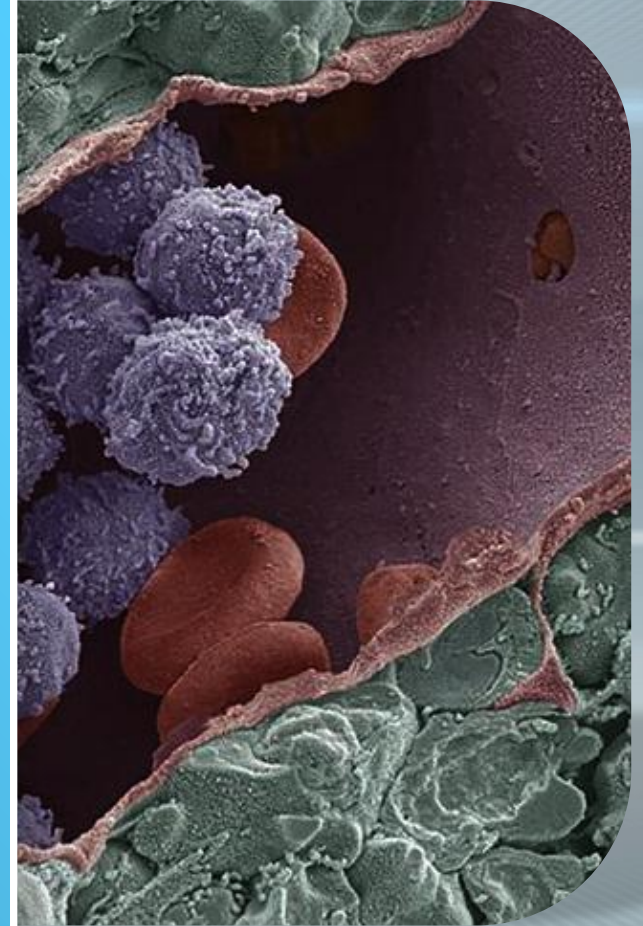


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# THE PROBLEM OF MULTIPLE

Swiss Medica Clinic has developed the Adult Autologous Stem Cell Therapy program to treat a variety of conditions, including multiple sclerosis, cerebral palsy, muscular dystrophy, stroke, amyotrophic lateral sclerosis and traumatic brain injury, etc.



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# THE PROBLEM OF MULTIPLE

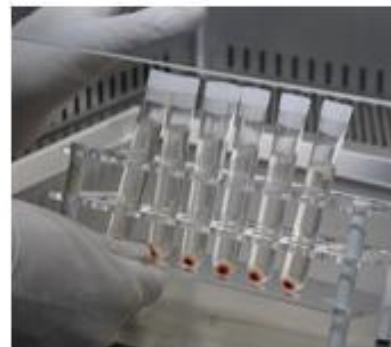
During stem cell treatment a patient receives 200 - 300 million stem cells. This quantity of the restored plain cells not only covers daily losses, but exceeds them thousands of times.

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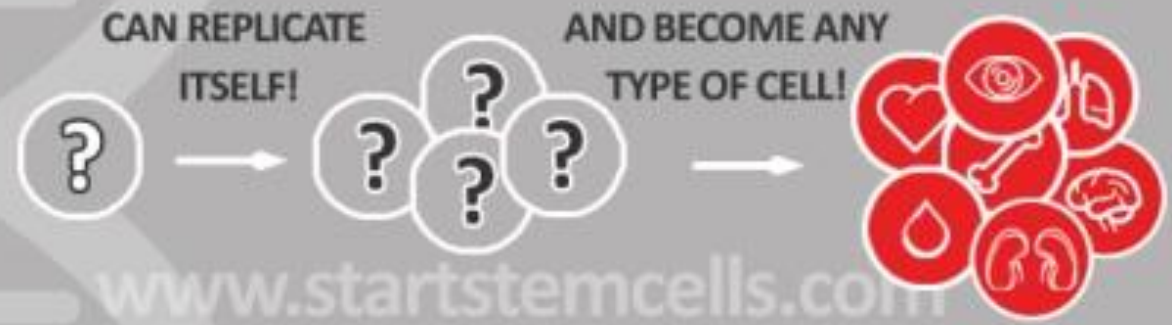
# THE PROBLEM OF MULTIPLE

Thus the reserve of the stem cells, almost lost for the latest 15 - 20 years, is restored. Naturally,

after replacement, the stem cells become active and replace the old and damaged ones.



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Once injected, **STEM CELLS** are "homing" to the place of injury in order to **REPAIR & REBUILD** damaged tissue.





## STEM CELL TREATMENT PROCESS

### 4 EASY STEPS



HARVEST - SEPARATION - ACTIVATION - TREATMENT

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with

### REGENERATION

NEW INNOVATIVE METHODS FOR BOOSTING  
STEM CELL TREATMENT RESULTS



INTRAVENOUS OXYGEN



XENON GAS



BLOOD IRRADIATION



PLASMAPHERESIS



EMF TREATMENT

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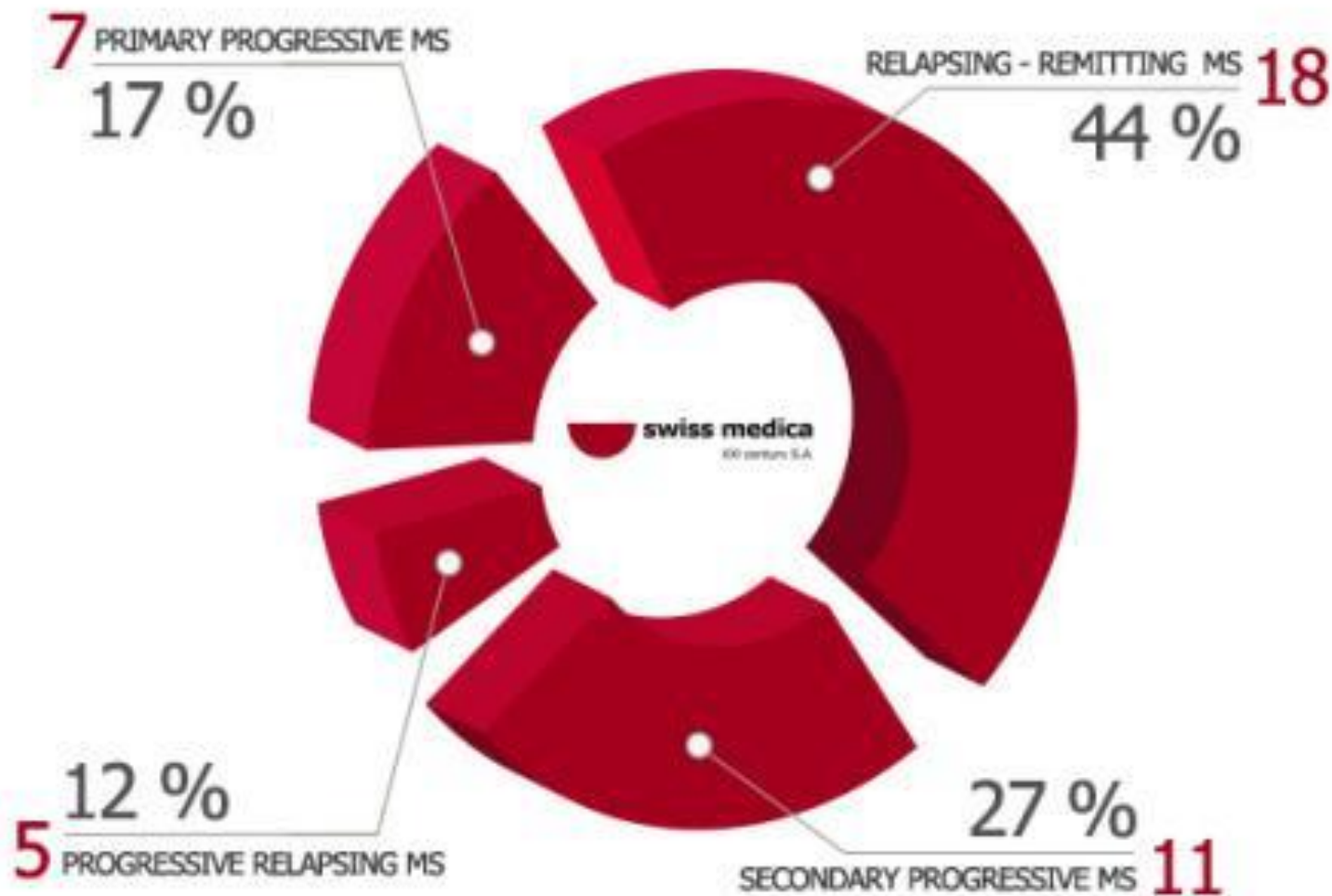
# THE PROBLEM OF MULTIPLE

The goal of this MS Cumulative report is to assess the success of Stem cells treatment in multiple sclerosis patients at Swiss Medica treatment center.



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# THE PROBLEM OF MULTIPLE



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2 PROGRESSIVE RELAPSING MS  
15 %

SECONDARY PROGRESSIVE MS 11



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# THE PROBLEM OF MULTIPLE



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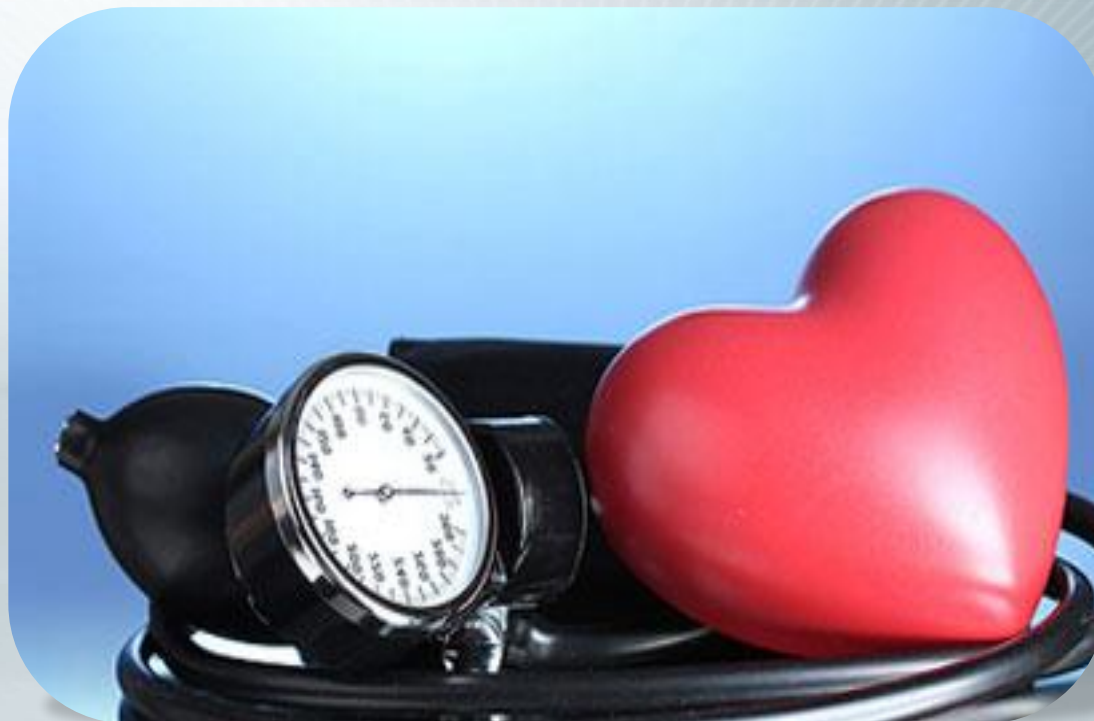
WALKING AGAIN  
A MONTH AFTER  
**STEM CELLS**  
MS TREATMENT



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# THE PROBLEM OF MULTIPLE



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# THE PROBLEM OF MULTIPLE



THANK YOU 😊

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M.Sc. PhD MD Bochkarev IA

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