

# CHOCICES

## DISEASE MODIFYING DRUGS (DMDs)

Disease Modifying Drugs – DMDs – are drugs which affect the long-term progression of MS. They target inflammation and are designed to reduce the damage caused by relapses. By doing this, the number and severity of relapses decreases. Some of these drugs have been found to delay the long term progression of MS and reduce the number of new lesions forming.

There are currently six DMDs available. These fall into three categories:

- Interferon beta - there are two forms of Interferons: Interferon beta-1a and Interferon beta-1b (the differences between them are in the way they are made)
- Glatiramer acetate
- Fingolimod (Gilenya)

### Interferon beta-1a

There are currently two Interferon beta-1a DMDs available – Avonex and Rebif. Avonex is injected into the muscle once a week. Rebif is injected under the skin three times a week. The most common side effect experienced with both of these treatments is flu like symptoms after injecting. They can also cause changes in menstruation, blood abnormalities and mood swings; however these symptoms are less common.

### Interferon beta-1b

There are currently two Interferon beta-1b DMDs available – Betaferon and Extavia. They are both injected under the skin on alternate days. The most common side effects experienced with both of these treatments are flu like symptoms after injecting and injection site reactions. They can also cause changes in menstruation, blood abnormalities and mood swings; however again these symptoms are less common.

### Glatiramer acetate

The Glatiramer acetate DMD is called Copaxone. This is injected under the skin every day. Common side effects are injection site reactions and lipotrophy (indentations under the skin). This DMD can also cause chest tightness, breathlessness, anxiety, flushing and palpitations after injection. However, these symptoms are less common and they typically pass within a few minutes.

### Fingolimod (Gilenya)

Fingolimod (Gilenya) is a newly approved DMD. It is licensed for people with rapidly evolving severe relapsing remitting MS or as a treatment for those who have not seen sufficient improvement from front line treatments such as the DMDs listed above. Fingolimod is the first oral



disease modifying drug. Possible side effects include headache, upper respiratory tract infection, shortness of breath, diarrhoea and nausea.

A monoclonal antibody called **Tysabri** is also available as a treatment for MS. However it works differently to DMDs and is not technically classed as a Disease Modifying Drug. It works by preventing immune cells leaving the blood stream and entering areas of inflammation.

*For more information, please see our choices leaflet 'Tysabri'*

### ***How do these drugs work?***

#### Interferon beta

Interferons are proteins which are produced naturally by the human body. They play an important role in the immune system and help to fight infections. Beta Interferons work by blocking the action of the gamma Interferons (which are thought to bring on MS symptoms) and therefore reducing the autoimmune reaction, which causes inflammation and destruction of myelin.

#### Glatiramer acetate

Glatiramer acetate (Copaxone) works differently to Interferon beta. It is designed to mimic the proteins in myelin and is thought to prevent the production of the immune cells which attack the myelin, thereby reducing MS symptoms and related damage to myelin and nerve fibres.

#### Fingolimod (Gilenya)

Fingolimod attaches to the surface of lymphocytes (a type of white blood cell) and causes a high number of them to be retained within the bodies immune system (in the lymph nodes). This means there are less lymphocytes in the bloodstream and so fewer reach the central nervous system. The immune attack on the cells of the brain and spinal cord is therefore reduced.

### ***Are disease modifying drugs for me?***

Not everyone with MS will benefit from DMDs in the same way. Guidance has been issued by the Association of British Neurologists (ABN) setting out the eligibility criteria for the prescribing of these drugs. In order to be prescribed any of the disease modifying drugs, an individual must meet the following:

- Be able to walk at least 10 metres with or without assistance for Interferon beta or be able to walk at least 100m without assistance for Glatiramer acetate
- Have experienced at least two clinically significant relapses in the last two years
- Normally be aged 18 or above (although they have been given to children with MS and a Neurologist will assess this on a case by case basis)

### ***Will I still have relapses?***

Those who are on DMDs are likely to still have some relapses. However, most people have fewer relapses than before they began taking the drug and relapses are usually less severe than before.

If you suffer from flu-like symptoms after injection, try changing the time of day you take your injection; perhaps to just before bedtime so you can sleep through the side effects. Alternatively, take Ibuprofen two hours before the injection to ease the side effects.

If you suffer from injection site reactions, you could try using Emla cream which numbs the area prior to the injection. Always rotate the injection site – avoid injecting the same area each time. It may also help to ensure the drug is at room temperature.

If your side effects do become severe or you feel unable to cope with them, contact your MS nurse or Neurologist who will be able to advise you further.