



WITH MORE KNOWLEDGE COMES MORE POWER

LEARN HOW TO HELP MAINTAIN YOUR ABILITIES AND
ALTER THE COURSE OF MULTIPLE SCLEROSIS



Learn how to improve the quality of your life through the power of knowledge

Whether you have recently been diagnosed with multiple sclerosis (MS), or have been living with it for some time, learning about treatment options is always important. The right treatment can help you maintain your abilities and quality of life.

Living with MS doesn't mean you can't lead a productive and active life. Learning about MS and how it affects your body is the first step in making informed decisions about managing the disease. This will help you understand how potential treatment options, such as disease-modifying drugs, can affect your symptoms, your lifestyle and your future.

This educational guide will provide you with valuable information about MS, different treatment options, and the benefits of early initiation and treatment adherence to help you maintain your abilities as you live with MS.



These speech bubble icons will direct you to specific sections of **MSvillagecanada.ca** for more valuable information and support on the current topic.

MSvillagecanada.ca is a FREE education program and online community developed by people with MS, for people with MS. It provides valuable information on how to live with MS, expert advice and insights from healthcare professionals and an opportunity to connect with other Canadians affected by MS.



What is **multiple sclerosis**?

MS is a chronic, debilitating disease that attacks the myelin coating in the central nervous system. Myelin is the protective coating that covers the nerve fibers in the brain and spinal cord (central nervous system, or CNS). When attacked, the transmission of nerve impulses is either slowed or blocked, affecting certain mental and physical abilities and skills.

The most common form of MS is relapse-remitting MS (RRMS). Approximately 85% of people with MS have this form of the condition.¹

To understand the immune system and how it is affected by MS, visit the *About MS* section on **[MSvillagecanada.ca](https://www.msvillagecanada.ca)**.



Causes of MS

Although the causes of MS are still unknown, extensive research and studies have provided insight into the origins and triggers. Scientists believe MS is most likely caused by a combination of immunological, environmental, infectious and genetic factors.

MS SYMPTOMS

Symptoms of MS are unpredictable and vary greatly from person to person and from time to time in the same person. Even relapse symptoms and severity can be different with each relapse. MS symptoms may include:

- Vision problems
- Fatigue
- Tingling/numbness
- Muscle weakness
- Discomfort/pain
- Loss of balance
- Spasticity
- Memory or cognitive problems
- Sexual dysfunction
- Bladder and bowel problems



“The MS Village forums and Facebook discussions are open and honest—people can share feelings and experiences and learn from others who ‘know’ what it’s about.”

For more information about the onset and symptoms of MS, visit the *Newly Diagnosed* section on MSvillagecanada.ca. For more information about the types of MS, visit the *About MS* section.





“ I tell my patients that we don't have a cure yet, but what is available may help you maintain your current level of functioning and delay progression of disability. ”

Dr. Virender Bhan
Neurologist

MS treatments that may help you **maintain your abilities**

While there is no cure for MS yet, there are effective treatments that have been found to alter the course of the disease and some may even delay the loss of ability. These treatments are called disease-modifying drugs (DMDs).

TREATING DISEASE: MODIFYING THE DISEASE COURSE WITH DMDs

The management of MS has been substantially advanced by the availability of DMDs. They can reduce disease activity and delay disease progression for many individuals with relapsing forms of MS, including those with secondary progressive disease who continue to have relapses.

If and when you decide medication is right for you, it helps to know the facts about the DMDs available.

There are several injectable medications available to treat MS. Each medication falls into one of two classes of DMDs; immunomodulators and selective adhesion molecule (SAM) inhibitors.



“ I’m lucky to be part of such a supportive community; I’ve already met so many great people through the MS Village Forum and Facebook page. MS Village gives me the information, direction and support that truly help me live with my MS. ”



Maintaining your abilities

If you’re newly diagnosed and have yet to decide on the right treatment course, speak to your neurologist about what you can do to prevent further disease progression and disability.

To prepare for the conversation, read Dr. Virender Bhan’s *Guest Editorial* about Maintaining Ability on MSvillagecanada.ca for helpful questions and discussions you can use at your next appointment.

You can **improve your quality of life** with MS through disease-modifying drugs

Disease-modifying drugs have the power to alter the course of MS and improve your quality of life by helping to delay the progression of disability.



DISEASE-MODIFYING DRUGS CAN:

1. Slow the progressive loss of ability common in MS (by helping to prevent nerve damage)
2. Reduce the number and severity of relapses
3. Reduce the number and/or size of lesions on MRI scans*

Not all disease-modifying therapies are the same. Some treatments are better than others at reducing the number and severity of relapses or the number and size of lesions on MRI scans.* They also differ in their safety and efficacy and route of administration. You should talk to your neurologist about which medication is right for you.



“ Here we can communicate with those who know exactly what we are going through, and we can help and inspire others like ourselves to keep fighting. This is a place where, if we have to vent frustrations, we can do so and know we are not being judged. ”



For more information about treatments for MS, click on the blue MS treatment tab on MSvillagecanada.ca and select *Comparing DMDs*.

*The exact relationship between MRI findings and the clinical status of patients is unknown.

Disease-modifying drugs (DMDs) what's the difference?

Immunomodulators

Approved uses	Avonex [®] (interferon beta-1a) ²	Rebif [®] (interferon beta-1a) ³
Slows the development of physical disability	✓	✓
Decreases the number of flare-ups	✓	✓
Reduces the number of hospitalizations		✓
Reduces the need for steroids		✓
Reduces disease activity as measured by MRI* for people with RRMS	✓	✓
Treatment for single demyelinating event (SDE) with MRI results consistent with MS	✓	
Decreases the burden of disease and number and amount of active lesions in people with a SDE	✓	
Delays development to definite MS	✓	
Reduction of flare-ups and improvement in MRI measures in people with PRMS [†]	✓	✓
Slows the development of disability in people with SPMS		
Safety/Tolerance		
Most common side effects (most of these symptoms tend to disappear over time)	Flu-like symptoms [‡]	Flu-like symptoms [‡] and injection site reactions [§]

*The exact relationship between MRI findings and the clinical status of patients is unknown.

†PRMS: progressive-relapsing MS; people with SPMS who still have flare-ups.

‡Flu-like symptoms: fatigue, chills, fever, muscle aches and sweating.

§Injection site reactions: swelling, redness, discolouration and pain.

¶Natalizumab is generally recommended for MS patients who have had an inadequate response to, or are unable to tolerate, other MS therapies.

			Selective adhesion molecule (SAM) inhibitor
Betaseron® (interferon beta-1b) ⁴	Extavia® (interferon beta-1b) ⁵	Copaxone® (glatiramer acetate) ⁶	Tysabri® (natalizumab) ^{7¶}
			✓
✓	✓	✓	✓
		✓	✓
✓	✓	✓	
		✓	
✓	✓	✓	
✓	✓		
Flu-like symptoms [‡] and injection site reactions [§]	Flu-like symptoms [‡] and injection site reactions [§]	Injection site reactions [§]	Flu-like symptoms [‡] , urinary tract infection, sore throat, runny nose, hives, dizziness, nausea, vomiting, joint pain, tiredness and infusion reactions

How DMDs are administered

	Immunomodulators	
Administration	Avonex® (interferon beta-1a) ²	Rebif® (interferon beta-1a) ³
Route of administration	Intramuscular injection (into the muscle)	Subcutaneous injection (just under the skin)
Frequency of injections	1 time/week	3 times/week
Needle gauge (G) (the higher the gauge, the thinner the needle)	23G (25G needle can be substituted)	29G or 30G
Needle length	1 inch	½ inch
Autoinjector available	Personal Injector™	RebiSmart™/ Rebject II™
Pre-mixed medication	Yes	Yes
Patient support program		
	Avonex Therapy Support 1-800-456-2255	Multiple Support Program 1-888-677-3243

²Natalizumab is generally recommended for MS patients who have had an inadequate response to, or are unable to tolerate, other MS therapies.

[†]Must be administered by a healthcare professional at a certified infusion clinic; medication is infused over 1 hour and individual must be observed for 1 hour after the infusion is complete.

			Selective adhesion molecule (SAM) inhibitor
Betaseron® (interferon beta-1b)⁴	Extavia® (interferon beta-1b)⁵	Copaxone® (glatiramer acetate)⁶	Tysabri® (natalizumab)^{7*}
Subcutaneous injection (just under the skin)	Subcutaneous injection (just under the skin)	Subcutaneous injection (just under the skin)	IV infusion by a healthcare professional†
Every other day (3–4 times/week)	Every other day (3–4 times/week)	Daily (7 times/week)	Every 4 weeks
30G	27G	29G	N/A (IV infusion)
½ inch	½ inch	½ inch	N/A (IV infusion)
Betaject®	Extavia Auto-Injector™ II	Autoject®2	No
No	No	Yes	No
Betaplus™ 1-800-788-1467	Extracare™ 1-888-557-5050	Shared Solutions® 1-800-887-8100	Tysabri Care Program 1-888-827-2827



Making the **right treatment choice** for you

How you and your neurologist select the right treatment for you will depend on a variety of factors that are unique to you. Reviewing effectiveness, administration and side effects of each DMD with your neurologist will help you make the right decision, by weighing the advantages and disadvantages of each treatment.

“ Ideally, you should look for a treatment that’s convenient for you, relatively easy to tolerate and doesn’t have a negative impact on your quality of life. If you have trouble handling needles or find the side effects of your medication difficult to manage, tell your doctor—there are ways to minimize the impact of these problems. ”

Dr. Mark Freedman
Neurologist

BENEFIT FROM EARLY TREATMENT

Early treatment is recommended to alter the course of MS and to give you the best chance to maintain your current level of function and ability.* Those who begin treatment early and remain on treatment can minimize the risk of disability and increase their chances of maintaining a more normal and healthier lifestyle.† If you are deciding on the right treatment course, you should speak to your neurologist about what you can do to prevent further disease progression and disability.

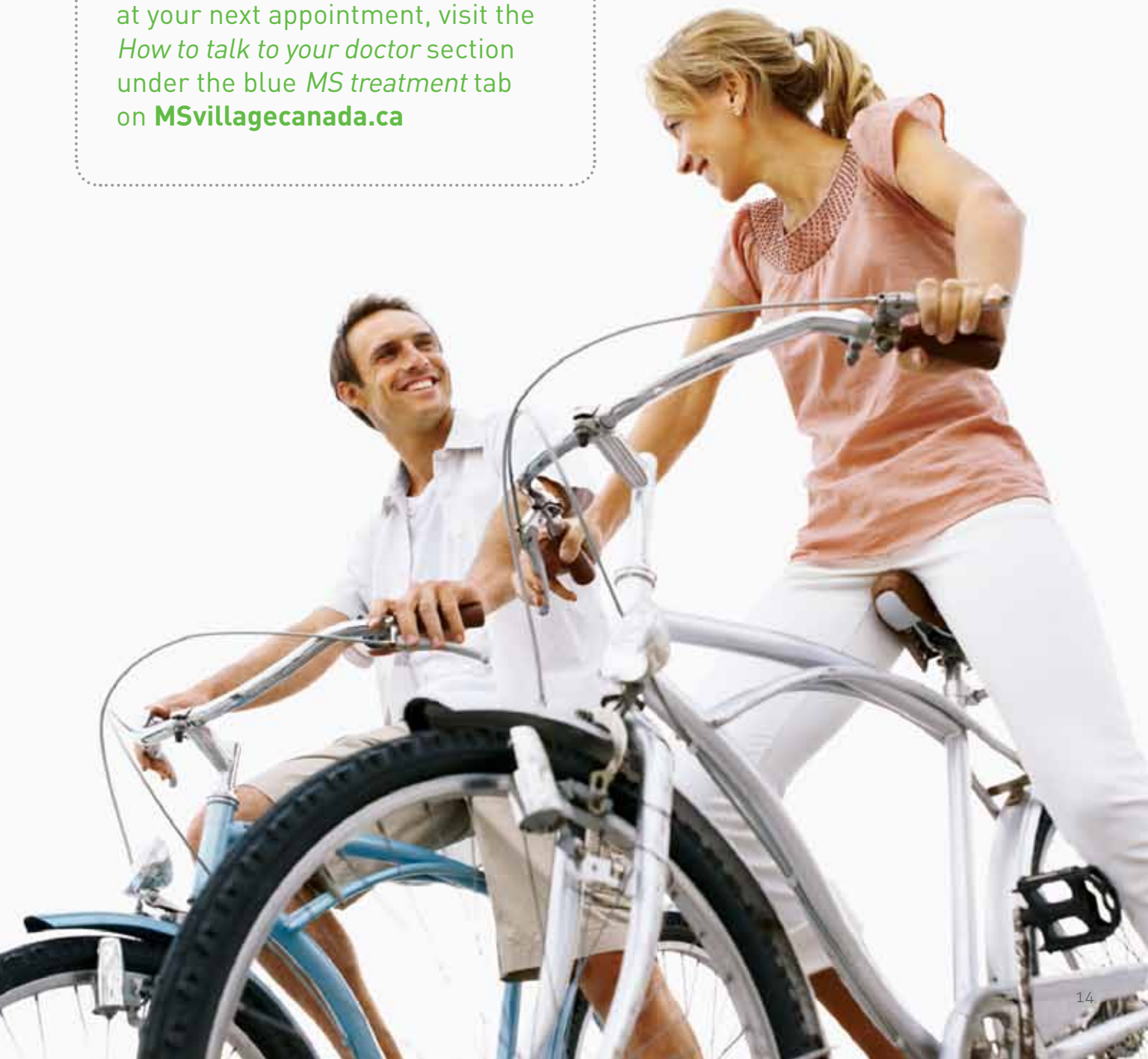
At no time should the information presented in this guide replace or supersede the recommendations of your own healthcare professional. If you have any concerns or questions, please speak to your healthcare professional.

*This publication refers to Avonex,^{®2} Rebif,^{®3} Betaseron,^{®4} Extavia,^{®5} Copaxone,^{®6} and Tysabri.^{™7} Tysabri[™] is generally recommended for MS patients who have had an inadequate response to, or are unable to tolerate other MS therapies.

†The exact relationship between MRI findings and the clinical status of patients is unknown.



For tips on talking to your doctor at your next appointment, visit the *How to talk to your doctor* section under the blue *MS treatment* tab on **MSvillagecanada.ca**





The Expanded Disability Status Scale (EDSS)

To monitor and evaluate your degree of ability and function, your neurologist or MS nurse will use the **expanded disability status scale** (EDSS), one of the most widely accepted assessment tools in MS.⁸

An EDSS score is calculated based on neurological testing and examination of functional systems, which are areas of the central nervous system (CNS) that control bodily functions. The seven functional systems (plus “other”) are⁹:

- Ability to walk
- Coordination
- Speech and swallowing
- Touch and pain
- Bowel and bladder functions
- Visual
- Mental or cognitive (e.g., memory)
- Other

EDSS scores fall within a clinical rating scale, as shown on the right; scores range from 0 to 10, with higher numbers indicating more severe impairment and disability.



The course of **MS** is different for everyone; therefore, **not everyone spends the same amount of time at each stage of the EDSS.** As well, many people will remain at a certain level of disability without necessarily progressing to the next level.



Staying on therapy may help you lead a more active lifestyle

Whichever disease-modifying therapy you decide is the right choice for you, it's beneficial to start early and stick with it.* Good adherence is regarded as the best possible strategy for managing MS successfully.¹⁰ Research has shown that stopping treatment may result in the return of pre-treatment disease activity.¹¹

METHODS TO IMPROVE YOUR ADHERENCE TO TREATMENT

Here are some tips you can use to improve your injection therapy experience to help you optimize treatment adherence:

- Keep a journal or calendar to record your injections so you can benefit from the full potential of your therapy
- Receive thorough injection training and learn how to manage injection site reactions¹⁰ (e.g., make sure the medication is at room temperature and there is no medication visible at the tip of the needle before injection)
- Decrease anxiety associated with self-injection and needles by using an autoinjector that keeps needles hidden¹²
- Work with your healthcare team to understand what you can expect from disease-modifying medications and how they can have a positive impact on your quality of life¹⁰

What is treatment adherence? Adherence refers to how closely you follow a prescribed treatment regimen, including your willingness to start treatment, your ability to take your medication exactly as directed by your healthcare team, and continuing to do so over the long term.

The convenience and comfort of autoinjectors help treatment adherence

Isabelle Bedirian, Registered Nurse

There are six disease-modifying therapies currently available as injectables—so it’s important to address how each injection routine and method fit into your lifestyle. Both of these factors can affect your motivation and ability to stay on therapy.

WHAT IS AN AUTOINJECTOR?

Autoinjectors are injection devices that automatically insert the needle and inject a single dose of medication. They can help people overcome the fear often associated with self-injection because most autoinjectors conceal the needle and insert it into the skin automatically.¹²

One such device is RebiSmart™—an innovative, personalized electronic autoinjector for MS therapy. RebiSmart™ was specifically designed for comfort and convenience; factors that affect adherence.¹³ It is unique in that it automatically records all injections—so you can track your injection schedule, which can help improve adherence. RebiSmart™ also lets you personalize your comfort settings to help you minimize pain and discomfort associated with injection, helping to improve your adherence to therapy and your treatment experience.



“By continuing with your therapy for the long-term, you increase your chances of experiencing the benefits of disease-modifying therapy.”

Isabelle Bedirian
Registered Nurse

MS therapy injection devices



<p>Feature</p>	<p>RebiSmart™ from EMD Serono For use with: Rebif® (interferon beta-1a)</p>
<p>Autoinjector</p>	<p>Electronic injection at the press of a button</p>
<p>Adjustable injection settings</p>	<p>Maximize injection comfort with adjustable needle speed, injection speed, injection time and needle depth</p>
<p>Dose log/memory</p>	<p>Records date, time and number of all previous injections to individualize injection schedule</p>
<p>Preset titration doses/schedule (for therapy initiation)</p>	<p>Easily preset by healthcare professional; can make therapy initiation easier for user*</p>
<p>On-screen multilingual instructions</p>	<p>Information and interactive instructions available in 26 languages help simplify and guide user through the injection process</p>
<p>Needle gauge (G) (the higher the needle gauge, the thinner the needle)</p>	<p>Hidden before, during and after injection* Two needle sizes: 29G and 30G†</p>

*RebiSmart.ca website. EMD Serono Canada Inc. Available at: <<http://www.rebismart.ca/index.aspx?l=0,2>>. †RebiSmart™ User Guide. EMD Serono Canada Inc. ‡Rebif® (interferon beta-1a) Product Monograph. EMD Serono Canada Inc. March 2010. §Rebifect II™ Injection Guide. EMD Serono Canada Inc. ¶Copaxone® (glatiramer acetate) Product Monograph. Teva Pharmaceuticals Industries Ltd. April 2009. #Teva website. Available at: <<http://www.tevapharm.com/copaxone/>>. **Your step by step video guide to injecting Extavia®. Novartis Pharmaceuticals Canada Inc. ††Extavia® (interferon beta-1b) Product Monograph. Novartis Pharmaceuticals Corporation. November 2009. ‡‡Betaseron® (interferon beta-1b) Product Monograph. Bayer Inc. December 2009. §§Injecting Betaseron® with the Betaject® Comfort. MS Gateway website (Bayer HealthCare). Available at: <www.ms-gateway.com/betaferonreg-user-guide/injecting-betaferonreg-with-the-betajectreg-comfort-159.htm>.



Rebinject II™ from EMD Serono
For use with: Rebif® (interferon beta-1a)

Automatic injection at the press of a button

Adjustable needle depth only

N/A

Option for a prefilled therapy initiation pack for the titration period[‡]

N/A

Hidden only before and during injection[§]
Needle size: 29G[‡]



Autoject®2 from Teva
Pharmaceutical Industries Ltd.
For use with: Copaxone®
(glatiramer acetate)

Automatic injection at the
press of a button

Adjustable needle
depth only

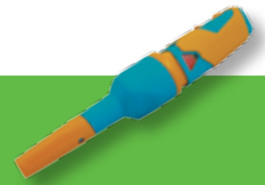
N/A

N/A (titration of the initial
dose is not necessary)[¶]

N/A

Hidden before, during
and after injection
Needle size: 29G[#]

^{¶¶}Injecting Betaseron™ with the Betaject™ Lite. MS Gateway website (Bayer HealthCare). Available at: <www.ms-gateway.com/betaferonreg-user-guide/injecting-betaferonreg-with-the-betajectreg-lite-160.htm>. ##Avonex® (interferon beta-1a) Product Monograph. Biogen Idec. May 2009. ***Biogen Idec, May 2009. Personal Injector™. Available at: <www.personalinjector.com/uk/index.php>. †††Understanding Avonex® PS. Biogen Idec.™



Extavia® Auto-Injector™ II
 from Novartis Pharmaceuticals
 Canada Inc.
 For use with Extavia®
 (interferon beta-1b)

Betaject® Comfort
 from Bayer Inc.
 For use with: Betaseron®
 (interferon beta-1b)

Betaject® Lite from Bayer Inc.
 For use with: Betaseron®
 (interferon beta-1b)

Automatic injection at the
 press of a button

Automatic injection at the
 press of a button

Automatic injection at the
 press of a button

Adjustable needle depth only

Adjustable needle depth only
 (by a trained healthcare
 professional only)

Adjustable needle depth only
 (by a trained healthcare
 professional only)

N/A

N/A

N/A

User follows professional
 instructions**

User is provided a therapy
 initiation pack for the
 titration period**

User is provided a therapy
 initiation pack for the
 titration period**

N/A

N/A

N/A

Hidden before, during
 and after injection**
 Needle size: 27G†

Hidden before, during
 and after injection^{§§}
 Needle size: 30G

Hidden only before and
 during injection†
 Needle size: 30G



Personal Injector™
 from Union Medico
 (licensed by Biogen Idec)
 For use with: Avonex®
 (interferon beta-1a)

Disposable syringe/needle
 available from all manufacturers
 Available for each
 disease-modifying drug product

Automatic injection at the
 press of a button

N/A

N/A (manual only)

N/A (manual only)

N/A

N/A

No therapy titration pack,
 user follows professional
 instructions and potentially
 wastes medication during
 therapy initiation period^{##}

Dependent on
 disease-modifying
 drug product

N/A

N/A

Exposed during entire
 administration process^{***}
 Two needle sizes: 23G
 and 25G^{††}

Exposed during entire
 administration process
 Needle size: dependent
 on disease-modifying
 drug product



To learn more about
 the types of injection
 devices available
 to administer MS
 therapy, visit the
Self-injection section
 under the blue *MS
 Treatment* tab on
MSvillagecanada.ca





“Ever since my MS diagnosis, people have been there for me—now it’s my turn to give back. I use the MS Village online forums to encourage those who are going through tough times and in turn, I receive support from them.”

“I logged on to MS Village right away. I’m usually a ‘lurker’, but already I have submitted a short ‘life story’, and have even offered to write a blog. These actions surprised me, but told me volumes about what I need, and what has been missing in my life. MS Village is greatly healing and encouraging by allowing me to reach out to others.”



Together we can **make a difference**

Become a member for FREE today at MSvillagecanada.ca



**JOIN MS VILLAGE AND BECOME A PART OF A
SUPPORTIVE AND PROACTIVE MS COMMUNITY**

MS Village is a Canadian, bilingual education program and online community that provides you with the opportunity to connect with other Canadians living with MS and share valuable information and support.

It's about making the right choices for you

The first step in living well with MS is to learn about how it affects your abilities and what your treatment options are. The second step is taking action.

For more information about MS in general, different treatment options, the benefits of early initiation, treatment adherence and maintaining your abilities, visit **MSvillagecanada.ca**.

MS Village wishes to acknowledge the generous contribution from the following Canadian MS experts in developing this educational brochure



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Neurologist



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1. What is MS? National Multiple Sclerosis Society. Available at: <<http://www.nationalmssociety.org/about-multiple-sclerosis/what-we-know-about-ms/what-is-ms/index.aspx>>. 2. Avonex® Product Monograph. Biogen Idec Canada Inc. May 2009. 3. Rebif® Product Monograph. EMD Canada Inc. March 2010. 4. Betaseron® Product Monograph. Bayer Canada Inc. November 2008. 5. Extavia® Product Monograph. Novartis Pharmaceuticals Corporation. November 2009. 6. Copaxone® Product Monograph. Teva Neuroscience. April 2009. 7. Tysabri® Product Monograph. Biogen Idec Canada Inc. January 2009. 8. Kurtzke JF. Rating neurologic impairment in multiple sclerosis: an expanded disability status scale (EDSS). *Neurology*. 1983;33(11):1444-52. 9. FSS and EDSS. National Multiple Sclerosis Society. Available at: <<http://www.nationalmssociety.org/for-professionals/researchers/clinical-study-measures/fss-and-edss/index.aspx>>. 10. Ross AP. Tolerability, adherence, and patient outcomes. *Neurology*. 2008;71(24 Suppl 3):S21-3. 11. National Clinical Advisory Board of the National Multiple Sclerosis Society. Expert Opinion Paper: Disease management consensus statement. 2007. Available through the <[nationalmssociety.org](http://www.nationalmssociety.org)>. 12. Barrow-Williams T, Burnell R. Auto-injectors: technology advances and market trends. *Innovations in Pharmaceutical Technology* (November 2007). 13. Cohen B, Rieckmann P. Emerging oral therapies for multiple sclerosis. *Int J Clin Pract*. 2007;61(11):1922-30.

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MS VILLAGE WANTS TO HEAR FROM YOU!

Share your experiences, ideas, feelings, information and news on MS through some of the world's largest social media networks, like Facebook, Twitter and YouTube. Plus! Meet other community members on the MS Village forum.

Connect with others and make an impact.

facebook

You Tube

twitter

MSvillagecanada.ca



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