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2. Interferon beta-1a

Interferon beta-1a

Pronunciation: *in-ter-feer-on beta-one-aye***Generic name:** interferon beta-1a**Brand names:** [Avonex](#), [Avonex Pen](#), [Avonex Prefilled Syringe](#), [Rebif](#), [Rebif Rebidose](#)**Dosage form:** intramuscular injection, subcutaneous injection**Drug class:** [Interferons](#)Medically reviewed by [Carmen Pope, BPharm](#). Last updated on Jan 2, 2025.[Uses](#) [Side effects](#) [Before taking](#) [Directions](#) [Dosage](#) [Interactions](#)

What is interferon beta-1a?

Interferon beta-1a is used to treat relapsing forms of **multiple sclerosis (MS)**, including clinically isolated syndrome, relapsing-remitting disease, and active secondary progressive disease, in adults.

- Brand names of interferon beta-1a are [Avonex](#), [Rebif](#), and [Rebif Rebidose](#).
- Avonex is injected into a muscle, usually once weekly at bedtime, on the same day each week (such as every Monday).
- Rebif is injected under the skin, usually 3 times per week (such as Monday, Wednesday, and Friday).

Interferon beta-1a's **mechanism of action** resembles that of interferons which are proteins naturally produced by our immune system that help regulate the body's immune response and fight viral infections. Interferon beta-1a is a man-made form of interferon that works in the same way, binding to specific receptors on cell surfaces and decreasing the activity of immune cells that attack the myelin sheath, reducing inflammation in the central nervous system, and helping to suppress the autoimmune response that characterizes MS.

Interferon beta-1a belongs to the **drug class** called interferons. It may also be called an immunomodulator.

Interferon beta-1a will **not cure MS**, it will only decrease the frequency of relapse symptoms.

Interferon beta-1a first gained **FDA approval** on May 17, 1996, under the brand name [Avonex](#). [Rebif](#) gained FDA approval on March 7, 2002. There is no interferon beta-1a generic.

Interferon beta-1a side effects

The **most common side effects** of interferon beta-1a include flu-like symptoms with symptoms such as:

- muscle aches
- fever

- tiredness
- chills
- stomach pain.

Interferon beta-1a may also cause changes in your liver tests.

Serious side effects and warnings

Interferon beta-1a can cause the following serious side effects.

Behavioral health problems including depression and suicidal thoughts. You may have mood problems while taking interferon beta-1a, for example, depression (feeling hopeless or feeling bad about yourself), or thoughts of hurting yourself or suicide. Contact your healthcare provider immediately.

Liver problems or liver failure has been reported in people taking interferon beta-1a. Contact your healthcare provider immediately if you develop any of the following symptoms:

- nausea
- loss of appetite
- tiredness
- dark-colored urine and pale stools
- yellowing of your skin or the white part of your eye
- bleeding more easily than normal
- confusion
- sleepiness.

Interferon beta-1a may cause **serious allergic and skin reactions**. Contact your healthcare provider or seek emergency medical attention if you develop any of the following symptoms:

- itching
- swelling of your face, eyes, lips, tongue or throat
- trouble breathing
- anxiousness
- feeling faint
- skin rash, hives, sores in your mouth, or skin blisters and peels.

Injection site problems. Interferon beta-1a may cause redness, pain, itching, or swelling at the place where your injection was given. Call your healthcare provider immediately if an injection site becomes swollen and painful or the area looks infected. You may have a skin infection or an area of severe skin damage (necrosis) requiring treatment by a healthcare provider.

Blood problems. Interferon beta-1a can affect your bone marrow and cause low red and white blood cell, and platelet counts. In some people, these blood cell counts may fall to dangerously low levels. If your blood cell counts become very low, you can get infections and problems with bleeding and bruising. Your healthcare provider may ask you to have

regular blood tests to check for blood problems.

Heart problems, including heart failure, have been reported with interferon beta-1a. Some people who did not have a history of heart problems developed heart muscle problems or congestive heart failure after receiving interferon beta-1a. If you already have heart failure, interferon beta-1a may cause your heart failure to get worse. Call your healthcare provider right away if you have worsening symptoms of heart failure such as shortness of breath or swelling of your lower legs or feet while using interferon beta-1a. Some people using interferon beta-1a may have other heart problems including:

- low blood pressure
- fast or abnormal heartbeat
- chest pain
- heart attack or a heart muscle problem (cardiomyopathy).

Pulmonary arterial hypertension. Pulmonary arterial hypertension (high blood pressure in the arteries of the lungs) can occur with interferon beta products, including interferon beta-1a. Symptoms may include new fatigue or shortness of breath. Contact your healthcare provider right away if you develop these symptoms.

Thrombotic microangiopathy (TMA). TMA is a condition that involves injury to the smallest blood vessels in your body and this has been reported with interferon beta-1a. TMA can also cause injury to your red blood cells (the cells that carry oxygen to your organs and tissues) and your platelets (cells that help your blood clot) and can sometimes lead to death. Your healthcare provider may tell you to stop taking interferon beta-1a if you develop TMA.

Seizures. Some people have had seizures while taking interferon beta-1a.

Autoimmune diseases. Problems with easy bleeding or bruising (idiopathic thrombocytopenia), thyroid gland problems (hyperthyroidism and hypothyroidism), and autoimmune hepatitis have happened in some people who use interferon beta-1a.

During your treatment with interferon beta-1a see your healthcare provider regularly and have regular blood tests to check for side effects.

Tell your healthcare provider if you have any side effect that bothers you or does not go away. These are not all the possible side effects of interferon beta-1a. For more information, ask your healthcare provider or pharmacist. Call your doctor for medical advice about side effects. You may report side effects to the FDA at 1-800-FDA-1088.

 [Interferon beta-1a side effects](#) (more detail)

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Before taking

Do not take interferon beta-1a if you are allergic to interferon beta, human albumin, Rebif, Avonex, or any inactive ingredients in the injection (see below for a list of inactive ingredients).

Before you take interferon beta-1a, tell your healthcare provider if you have or have had any of the following conditions:

- mental illness, including depression and suicidal behavior
- liver problems
- bleeding problems or blood clots
- low blood cell counts
- seizures (epilepsy)
- thyroid problems
- drink alcohol
- you are pregnant or plan to become pregnant
- you are breastfeeding or plan to breastfeed.

Pregnancy

It is not known if interferon beta-1a can harm your unborn baby.

Breastfeeding

Interferon beta-1a may pass into your breast milk. Talk with your healthcare provider about the best way to feed your baby while taking this medicine.

 [Interferon beta-1a pregnancy and breastfeeding warnings](#) (more detail)

How should I use interferon beta-1a?

See the *Instructions for Use* that come with your interferon beta 1a product.

- Your healthcare provider should show you how to prepare, measure, and inject your dose of interferon beta-1a before you use it for the first time.

How to inject Avonex for intramuscular use

Interferon beta-1a (Avonex brand) is given **1 time each week by injection into the muscle** (intramuscular injection).

- Inject Avonex exactly as your healthcare provider tells you.

- Your healthcare provider will tell you how much Avonex to inject and how often to inject Avonex. Do not inject more than your healthcare provider tells you to.
- Do not change your dose unless your healthcare provider tells you to.

Change (rotate) the injection site you choose with each injection. This will help decrease the chance that you will have an injection site reaction.

- Do not inject into an area of the body where the skin is irritated, reddened, bruised, infected or scarred in any way.

Avonex comes as a:

- Single-dose prefilled syringe (can be used with the Avostartgrip titration kit)
- Single-dose prefilled autoinjector Pen (Avonex Pen)

After 2 hours, check your injection site for redness, swelling, or tenderness. If you have a skin reaction that does not clear up in a few days, contact your healthcare provider.

Your healthcare provider will decide which one is best for you.

Always use a new, unopened Avonex single-dose prefilled syringe or single-dose prefilled autoinjector pen for each intramuscular injection.

See the [Avonex Package Insert](#) for complete administration instructions.

How to inject Rebif for subcutaneous use

Interferon beta-1a (Rebif brand) is given by injection under the skin (subcutaneous injection) **on the same 3 days a week**, for example, Monday, Wednesday, and Friday.

- Your injections should be at least 48 hours apart. Take them at the same time each day.
- Inject interferon beta-1a exactly as your healthcare provider tells you.

Your healthcare provider will tell you how much interferon beta-1a to inject and may change the dose based on how your body responds. Do not inject more than your healthcare provider tells you to.

- Do not change your dose unless your healthcare provider tells you to.
- Change (rotate) the injection site you choose with each injection. This will help decrease the chance that you will have an injection site reaction.
- Do not inject interferon beta-1a into an area of the body where the skin is irritated, reddened, bruised, infected, or scarred in any way.

Rebif comes as a:

- prefilled syringe
- single-use prefilled autoinjector (Rebif Rebidose).

Your healthcare provider will decide which is best for you. Always use a new, unopened, prefilled syringe or autoinjector for each injection. Do not reuse prefilled syringes or autoinjectors.

See the [Rebif Package Insert](#) for complete administration instructions.

Interferon beta 1a dosage

Avonex dosing information

The recommended dose of Avonex for MS is Avonex 30 micrograms IM once a week.

- Avonex may be titrated, starting with 7.5 micrograms for the first week, to reduce flu-like side effects.
- Increase the dose by 7.5 micrograms each week for the next 3 weeks until the recommended dose of 30 micrograms.

See the [Avonex Prescribing Information](#) for full dosage instructions.

Perform the first injection under the supervision of an appropriately qualified healthcare professional.

Pain and/or fever-relieving medicines on treatment days may help reduce side effects such as flu-like symptoms.

Rebif dosing information

The recommended dose of Rebif for MS is either 22 micrograms or 44 micrograms injected subcutaneously three times per week.

Titration: Generally, the starting dose should be 20% of the prescribed dose three times per week, and increased over 4 weeks to the targeted recommended dose of either 22 micrograms or 44 micrograms injected subcutaneously three times per week. Your healthcare provider will calculate this dose for you.

Pain and/or fever-relieving medicines on treatment days may help reduce side effects such as flu-like symptoms.

See the [Rebif Prescribing Information](#) for full dosing instructions.

 [Detailed Interferon beta-1a dosage information](#)

What other drugs will affect interferon beta-1a?

Tell your healthcare provider about all medicines you take, including prescription and over-the-counter medicines, vitamins, and herbal supplements.

Interferon beta-1a and other medicines may affect each other causing side effects. Ask your healthcare provider or pharmacist for a list of these medicines, if you are not sure.

Know the medicines you take. Keep a list of them to show your healthcare provider and pharmacist when you get a new medicine.

 [Interferon beta-1a drug interactions](#) (more detail)

Does interferon beta-1a interact with my other drugs?

Enter medications to view a detailed interaction report using our [Drug Interaction Checker](#).

interferon beta-1a

+

Enter a drug name

Storage

Store interferon beta-1a in the refrigerator between 36°F to 46°F (2°C to 8°C).

Do not freeze interferon beta-1a.

If you cannot refrigerate your Rebif pen or autoinjector, you can store it at temperatures above 36°F and below 77°F (2°C to 25°C) for up to 30 days.

If you cannot refrigerate your Avonex pen or prefilled syringes you can store them at room temperature up to 77°F (25°C) for up to 7 days.

Keep interferon beta-1a away from heat and light.

Interferon beta-1a ingredients

Avonex injection ingredients

Active ingredient: interferon beta-1a

Inactive ingredients:

- Single-dose Avonex prefilled syringe: arginine hydrochloride, glacial acetic acid, polysorbate 20, sodium acetate trihydrate in water for injection.
- Single-dose Avonex prefilled autoinjector pen: arginine hydrochloride, glacial acetic acid, polysorbate 20, sodium acetate trihydrate in water for injection.

Rebif injection ingredients

Active ingredient: interferon beta-1a

Inactive ingredients: albumin (human), mannitol, sodium acetate, water for injection

Single-dose Rebif prefilled syringe is available as 8.8 mcg in 0.2 mL, and 22 mcg or 44 mcg in 0.5 mL.

Single-dose Rebif autoinjector is available as 8.8 mcg in 0.2 mL, and 22 mcg or 44 mcg in 0.5 mL.

Who makes interferon beta-1a?

Biogen Inc. makes interferon beta-1a under the brand name Avonex.

EMD Serono Inc. makes interferon beta-1a under the brand name Rebif.

Interferon beta-1a Biosimilars

Biosimilar and interchangeable products are biological products that are highly similar to and have no clinically meaningful differences from the reference product.

Reference products

These are biological products that have already been approved by the FDA, against which biosimilar products are compared. There are 2 for interferon beta-1a.

Avonex (interferon beta-1a) - Biogen Inc.



Formulation type	Strength
Autoinjector	30 mcg/0.5 mL
Pre-Filled Syringe	30 mcg/0.5 mL
Single-Dose Vial	30 mcg Discontinued

View [Avonex](#) information in detail.

Rebif (interferon beta-1a) - EMD Serono, Inc.



References

1. [Avonex Medication Guide](#)
2. [Avonex Prescribing Information](#)
3. [Rebif Medication Guide](#)
4. [Rebif Prescribing Information](#)

More about interferon beta-1a

- [Check interactions](#)
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Patient resources

- [Interferon Beta-1a Autoinjector and Prefilled Syringes \(Rebif\) patient information](#)
- [Interferon Beta-1a Vials \(Avonex\)](#)

Other brands

[Avonex](#), [Rebif](#), [Rebif Rebidose](#), [Avonex Pen](#)

Professional resources

Other brands

[Avonex](#), [Rebif](#)

Related treatment guides

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DRUG STATUS

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 Risk data available

CSA Schedule*

N/A Not a controlled drug



Approval History

 Drug history at FDA



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7.4 / 10

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