

Multifocal Motor Neuropathy (MMN)



What is multifocal motor neuropathy?

Multifocal motor neuropathy, or MMN, is a rare, treatable immune-mediated disorder that causes muscle weakness that despite treatment can worsen over time. MMN is a slowly progressive disease that commonly affects one side of the body (asymmetric) and commonly begins in the finger, thumb, wrist, or lower limb. It affects the strength in the lower parts of the arms and hands more than the legs, usually without affecting the touch sensation.^{1,2}

It is thought that with MMN, the immune system abnormalities affect a protective layer around nerve cells that control muscle function. The protective layer (myelin sheath) normally allows messages to be sent properly and quickly along the nervous system. When the protective layer breaks down (a process called demyelination), nerve damage can occur. When messages are interrupted, muscle weakness can occur.^{3,4}

Why is MMN sometimes misdiagnosed?

MMN is a rare nerve disorder with symptoms that are somewhat similar to those of other peripheral neuropathies.^{3,5}

Muscle weakness, spasms, and cramping often associated with MMN also are seen in individuals with amyotrophic lateral sclerosis (ALS). Unlike MMN, ALS is rapidly progressive, affecting respiratory muscle weakness.^{3,5}

In other people, MMN may be confused with nerve compression conditions, including carpal tunnel syndrome.⁶

An accurate diagnosis of MMN is important so that it can be treated appropriately.

How is MMN diagnosed?

The diagnosis of MMN often is based on a physical exam, evaluation of symptoms, a electromyography (EMG) test, nerve conduction study, laboratory tests, MRI, and medical history.^{3,6}

Your healthcare provider also may request a blood sample or order other tests to fully understand your peripheral neuropathy and provide an accurate diagnosis.³

How is it treated?

For adults with MMN, the only FDA-approved treatment is GAMMAGARD LIQUID intravenous immunoglobulin (IVIg) therapy.^{1,3}

IVIg is made from human blood that is donated by healthy people. Validated virus inactivation/removal steps have been integrated into the IVIg manufacturing process. However, it can still carry the risk of transmitting infectious agents that can cause disease, e.g., viruses, the variant Creutzfeldt-Jakob disease (vCJD), and theoretically, the Creutzfeldt-Jakob disease agent.¹

GAMMAGARD LIQUID (IVIg) is a maintenance treatment for MMN in adults. In the clinical study, GAMMAGARD LIQUID was shown to improve or maintain muscle strength and reduce disability in patients.¹

Selected Important Risk Information

Stop the infusion immediately and contact your healthcare provider or call emergency services if you have any of the following:

Symptoms of thrombosis (blood clots) that may include: pain, swelling, warmth, redness, or a lump in your legs or arms.

MMN:

- Rare, treatable, but incurable disorder characterized by asymptomatic, predominantly distal limb weakness³
- Symptoms include muscle weakness, cramps, spasms³
- Characteristically, due to motor nerve conduction disorder³
- Muscle strength has been shown to improve with treatment^{1,3}

Symptoms of a kidney problem may include: reduced urination, sudden weight gain or swelling in your legs.

Will I regain muscle strength?

Every person with MMN is different, so treatment effect will vary based on the level of disease and response to treatment.³

For adults with MMN, treatment with GAMMAGARD LIQUID has been shown to improve muscle strength and reduce disability.¹

Your healthcare provider will monitor your health, including muscle strength and function, and may recommend changes in the amount or frequency of your treatment.^{1,3}

What will treatment involve?

Treatment schedules for MMN can vary, depending on individual disease status and treatment response.^{1,3}

Some people with MMN may receive IVIg treatment every 2 to 4 weeks. Changes in muscle strength and function will be evaluated during medical visits.^{1,3} Dose adjustments may be necessary based on clinical response.

It's important to communicate with your healthcare provider about your health and symptoms and about the treatment that is right for you.

GAMMAGARD LIQUID
[Immune Globulin Infusion (Human)] 10%

Please see Indication and Important Safety Information on reverse side and the accompanying FDA-approved patient labeling.

To learn more, go to
**[www.gammagard.com/
MMN/patients-and-families](http://www.gammagard.com/MMN/patients-and-families)**
or call **1-855-250-5111**.

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Indication and Important Safety Information

What is GAMMAGARD LIQUID?

- GAMMAGARD LIQUID is a ready-to-use, liquid medicine that contains immunoglobulin G (IgG) antibodies. GAMMAGARD LIQUID is used to treat adult patients with multifocal motor neuropathy (MMN).
- GAMMAGARD LIQUID is made from human plasma that is donated by healthy people.
- MMN is a rare disease that causes muscle weakness that worsens over time. It affects the strength of the lower parts of arms and hands more than the legs, usually without affecting the touch sensation.
- GAMMAGARD LIQUID is given into a vein (intravenously) every 2 to 4 weeks as ordered by your physician. Although it is possible to give yourself infusions into a vein at home, they are more often given in a hospital or infusion center by a nurse. Only use GAMMAGARD LIQUID by yourself after you have been instructed by your healthcare provider.
- Reduced urination, sudden weight gain, or swelling in your legs. These could be signs of a kidney problem.
- Pain, swelling, warmth, redness, or a lump in your legs or arms. These could be signs of a blood clot.
- Brown or red urine, fast heart rate, yellow skin or eyes. These could be signs of a liver or blood problem.
- Chest pain or trouble breathing, or blue lips or extremities. These could be signs of a serious heart or lung problem.
- Fever over 100°F. This could be a sign of an infection.

Whenever giving yourself treatments at home, you should have another responsible person present to help treat side effects or get help if you have a serious adverse reaction occur. Ask your healthcare provider whether you should have rescue medications available, such as antihistamines or epinephrine.

What are the possible or reasonably likely side effects of GAMMAGARD LIQUID for PI?

The following is a list of common side effects seen in clinical trials of GAMMAGARD LIQUID administered intravenously for MMN: Headache, chest discomfort, muscle spasms, muscular weakness, nausea, sore throat, ear pain, and pain in extremity.

These are not all the possible side effects. Talk to your healthcare professional about any side effects that bother you or that don't go away.

You are encouraged to report suspected side effects by contacting FDA at 1-800-FDA-1088 or www.fda.gov/medwatch or Shire at 1-800-999-1785.

The risk information provided here is not comprehensive. To learn more, talk about GAMMAGARD LIQUID with your healthcare provider or pharmacist.

Please click here for the [FDA-Approved Patient Product Labeling](#)

Important Safety Information

What is the most important information that I should know about GAMMAGARD LIQUID?

GAMMAGARD LIQUID can cause the following serious reactions:

- Severe allergic reactions causing difficulty in breathing or skin rashes
- Decreased kidney function or kidney failure
- Blood clots in the heart, brain, lungs or elsewhere in the body
- Severe headache, drowsiness, fever, painful eye movements, or nausea and vomiting
- Dark colored urine, swelling, fatigue, or difficulty breathing

Who should not use GAMMAGARD LIQUID?

Do not use GAMMAGARD LIQUID if you:

- Have a known history of a severe allergic reaction to IgG or other blood products.
- Have selective (or severe) immunoglobulin A (IgA) deficiency with antibodies to IgA.

GAMMAGARD LIQUID can cause serious side effects. Call your healthcare professional or go to the emergency department right away if you get:

- Hives, swelling in the mouth or throat, itching, trouble breathing, wheezing, fainting or dizziness. These could be signs of a serious allergic reaction.
- Bad headache with nausea, vomiting, stiff neck, fever, and sensitivity to light. These could be signs of irritation of the lining around your brain.

References:

1. GAMMAGARD LIQUID [Immune Globulin Infusion (Human)] 10% [package insert]. Westlake Village, CA: Baxter Healthcare Corp.
2. Slee M, Selvan A, Donaghy M. Multifocal motor neuropathy: the diagnostic spectrum and response to treatment. *Neurology*. 2007;69(17):1680-1687.
3. Vlam L, Van der Pol WL, Cats EA, et al. Multifocal motor neuropathy: diagnosis, pathogenesis and treatment strategies. *Nat Rev Neurol*. 2012;8:48-58.
4. Piepers S, Jansen MD, Cats EA, van Sorge NM, van den Berg LH, van der Pol WL. IVIg inhibits classical pathway activity and anti-GM1 IgM-mediated complement deposition in MMN. *J Neuroimmunol*. 2010;229(1-2):256-262.
5. Kaji R. Pathophysiology of multifocal motor neuropathy. *Schweiz Arch Neurol Psychiatr*. 2007;158:69-77.
6. Meuth SG, Kleinschnitz C. Multifocal motor neuropathy: update on clinical characteristics, pathophysiological concepts and therapeutic options. *Eur Neurol*. 2010;63:193-204.