Second-Line Treatments

Second-Line Treatments for Juvenile Myositis

Second-line treatments refer to options beyond steroids and methotrexate. They are designed to manage JM while reducing reliance on those medications.

We understand that adding new treatments to your child's regimen can be intimidating. However, rest assured that your doctor has carefully considered the benefits and risks of each option to design the best treatment plan for your family.

Treatment plans are tailored specifically to your child's needs, and there are often several good options. We encourage you to review all alternatives with your doctor at every visit. Your doctor understands your child's unique situation best.

It's also important to discuss the risks of untreated inflammation—which can lead to permanent damage—as this is a key reason for using these treatments.

Questions? Contact familyeducation@curejm.org

When is a Second-Line Treatment Considered:

- Second-line treatments sometimes get a bad rap. **But they are a good thing!**
- They can help control inflammation while reducing more toxic medications, such as prednisone and methotrexate.
- After prednisone is tapered, second-line treatments are often used to maintain inflammation control without having to go back to steroids.
- Second-line treatments can also be used to reduce the use of methotrexate for some children. If methotrexate isn't working for your family, due to anxiety or side effects, please discuss all your options with your doctor.

- **The goal of second line treatments is to find the right treatment that works well for your family and lifestyle.** There is no "right answer" as each treatment plan is tailored to your individual child.
- We encourage every family to ask at every visit: Here is how the treatment plan is affecting my child (side-effects, lifestyle). Can we discuss all of our treatment options?

Additional Considerations:

- For more information, watch our "Ask the Doc" session on second-line treatments: Understanding Second-Line Treatments and Side Effects.
- Currently, there are no FDA-approved treatments for juvenile myositis. All available therapies are used "off-label". This can sometimes make them hard to get approved by insurance companies. Learn about **discounted or free medication** here
- **Medications are one vital part of your treatment plan**. We recommend you also talk to your healthcare provider about how exercise, sleep, nutrition and emotional support can play a role in your health and recovery.

If you are taking any **supplements** at all, please inform your healthcare provider. Some seemingly healthy over-the-counter supplements may be dangerous for juvenile myositis patients.

Second-Line Treatment Options

1. Intravenous Immunoglobulin (IVIG)

- **Brand Names: Gammagard, Privigen, Gamunex-C, Octagam, others**
- **Now used frequently**, often from diagnosis. Some clinicians use as a first-line treatment in many cases.
- Provides **immunomodulatory effects** that help regulate the immune response.
- Typically given **monthly via infusion** and can improve muscle strength and skin involvement. Can be given more or less frequently as needed.
- Generally considered **safe**; IVIG is plasma donated from healthy donors.
- However, some patients may experience reactions if the infusion rate is too rapid or if proper hydration and premedication are not provided.
- For guidance on preparing for your first infusion, please refer to the following resource: https://www.curejm.org/what-parents-should-know-about-ivig-intra-venous-immunoglobulin/
- Note that many families prefer their **infusions at home**, for comfort and ease. With home infusions, a nurse comes to your home to administer the IV. Contact familyeducation@curejm.org for more information on home infusions.

2. Mycophenolate Mofetil or MMF (CellCept)

- **Oral liquid or pill**, depending on the child's preferences.
- **Widely used** in juvenile myositis with a long history of effectiveness.
- Proven to be **well-tolerated** in most children, with minimal side effects.
- **Steroid-sparing immunosuppressant**, often used as an alternative to methotrexate or steroids.

- Effectively controls both **skin and muscle** symptoms.
- **Decades of clinical experience** support its use in juvenile myositis treatment.

3. Biologic Therapies (Targeted Immune Modulators)

- **Rituximab (Rituxan)** – Anti-CD20 Monoclonal Antibody
  - Targets **B cells** that contribute to inflammation.
  - Studies suggest **safe and effective**.
  - Given by **infusion**, typically every 6 months.
- **TNF Inhibitors**
  - **Etanercept (Enbrel).** Sub-cutaneous injection, once or twice a week.
  - **Infliximab (Remicade).** Infusion, every 6-8 weeks.
  - **Adalimumab (Humira).** Sub-cutaneous injection, every 1-2 weeks.
  - In juvenile myositis, high levels of TNF-α can contribute to ongoing inflammation and tissue damage in the muscles and skin.
  - TNF inhibitors block the activity of TNF-α, preventing it from triggering excessive inflammation.
  - This helps reduce muscle and skin inflammation, slow disease progression, and improve symptoms like muscle weakness and joint pain.
- **Abatacept (Orencia)**
  - Inhibits T-cell activation.
  - Considered for harder-to-treat cases.
  - Clinical trial completed. Indicated safe and effective for JM.
  - Monthly infusion, shorter infusion time than IVIG.
- **Tocilizumab (Actemra)**
  - Monoclonal antibody against the interleukin-6 receptor (IL-6R), reducing inflammation
  - Used in certain harder-to-treat cases
  - Newer treatment
  - IV infusion or subcutaneous injection.
- **Belimumab (Benlysta)**
  - Newer option for JM.
  - FDA approved for lupus down to age 5
  - A monoclonal antibody that reduces B cell overactivity.
  - IV infusion or subcutaneous injection.
- **Anti-Interleukin-1 Agents**
  - Such as Anakinra (Kineret)
  - Blocks the activity of interleukin-1, a pro-inflammatory cytokine.
  - Subcutaneous injection, once or twice daily.

4. JAK Inhibitors or JAKs

- **Tofacitinib (Xeljanz)**, tablet given orally
- **Baricitinib (Olumiant)**, tablet given orally
- **Ruxolitinib (Jakafi)**, tablet given orally
- **Upadacitinib (Rinvoq)**, tablet given orally
- **Deucravacitinib (Sotyktu)**, tablet given orally
- **Ruxolitinib (Opzelura)**, topical cream
- **Brepocitinib (currently seeking FDA approval),** tablet given orally

- JAKs are newer treatment options that **block cytokine signaling** involved in inflammation.
- Some promising **case reports and small trials**. Larger trials are in progress.
- **Can be prescribed off-label**, meaning it is not FDA-approved specifically for juvenile myositis but can be used at the discretion of your healthcare provider.
- Currently, there are no FDA-approved treatments for juvenile myositis so all available therapies are used off-label.
- **Insurance coverage is often the biggest challenge with JAKs.** Typically, insurance requires several appeals to cover the treatment. Many times your healthcare provider will handle these appeals.
- Many clinicians take a flexible approach and will prescribe whichever JAK inhibitor is covered by your insurance.

4. Emerging Therapies on the Horizon

- **Anifrolumab (Saphnelo) –** A new treatment being explored for juvenile myositis.
- IV **infusion every four weeks.**
- A monoclonal antibody that **blocks type I interferon signaling**, a key driver of inflammation in autoimmune diseases.
- Many JM patients have an overactive interferon signature, contributing to muscle and skin inflammation.
- Early research and case studies suggest it may reduce skin disease and muscle weakness.
- May be steroid-sparing, which means it helps patients to reduce reliance on prednisone.
- Could offer a more targeted alternative to broad immunosuppressants.
- FDA-approved for lupus (SLE) in adults and currently being studied for juvenile myositis.

5. Clinical Trials

- **CAR-T**
  - CAR-T therapy is a treatment that uses your own immune cells, called T cells, to fight diseases like cancer.
    - Doctors take T cells from your blood.
    - In a lab, these cells are made “smarter” to recognize and attack specific disease cells.
    - The smarter T cells are put back into your body to find and destroy the harmful cells which are causing the JM.
  - Currently in clinical trials for JM.
    - Age 6+ in Chicago
    - age 18+ across the U.S.
  - Speak to your provider and learn more at https://www.curejm.org/clinical-trials/
  - Your healthcare provider is the best person to provide advice on if a clinical trial might be right for you.
- **CAR-NK**
  - A newer CAR treatment with less data than CAR-T
  - CAR-NK therapy is similar to CAR-T but uses natural killer (NK) cells from the immune system.
    - Similar to IVIG, NK cells are taken from a donor.
    - These cells are made “smarter” to target specific disease cells.
    - The “smarter” NK cells are infused into the patient's body to seek out and kill the harmful cells.
  - Currently recruiting JM patients age 17+.
  - Speak to your provider and learn more at https://www.curejm.org/clinical-trials/
  - Your healthcare provider is the best person to provide advice on if a clinical trial might be right for you.

Conclusion

Second-line treatments are chosen based on **disease severity, response to first-line therapy, and specific symptoms**, such as muscle vs. skin involvement. Many patients require **a combination of therapies** to control inflammation while minimizing steroid exposure.

If methotrexate is causing issues for your family, please inform your healthcare provider and ask about other options.

Each treatment plan is highly individualized for your child.

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