Chemical name	Cladribine	Natalizumab	Alemtuzumab
Indication	CIS, moderately and highly active* RRMS, active SPMS	CIS, moderately and highly active RRMS ,active SPMS	Highly active RRMS and active SPMS
Route of administration	Oral	Infusion	Infusion
Dosage	**Year 1** 1st weight-based course: maximum of 10 days of treatment **Year 2** 2nd weight-based course: maximum of 10 days of treatment (max of 20 days over 2 years)	**300 mg** every 4 weeks	**Year 1** 1st course: 12 mg/day on 5 consecutive days **Year 2** 2nd course: 12 mg/day on 3 consecutive days
Pre-treatment screening	• CBC with differential • LFTs • HIV • Hepatitis serology panel • VZV serology • TB screen • Serum pregnancy test (women of childbearing age)	• CBC with differential • LFTs • JCV serology	• CBC with differential • LFTs • Electrolytes • Serum creatinine • TSH • VZV serology • Hepatitis serology panel • Urinalysis with microscopy • TB screen • HIV • Serum pregnancy test (women of childbearing age)
On-treatment monitoring	Blood tests at 2 & 6 months, then every 6 months. No monitoring requirement after 3 years	Blood test at 3 and 6 months then regular blood test every 6 months	Regular blood & urine tests every month lasting four years after last infusion
Monitoring burden	Low	Low	High
Relapse-related effectiveness	High	High	High
Risk of infection	Slightly increased risk of infection	Slightly increased risk of infection	Increased risk of infection
Vaccines	Only inactivated vaccines. Possible for live attenuated vaccines when lymphocyte count is back to normal. No reduced vaccine efficacy	Only inactivated vaccines	Only inactivated vaccines. Possible for live attenuated vaccines after immune reconstitution
Pregnancy safety	**Not recommended** until 6 months after last tablet	Can be used until **30–34 weeks** of gestation with extended interval dosing (6–8 weeks)	**Not recommended** until 4 months after final infusion
Breastfeeding	Not recommended. Can breastfeed 7 days after last tablet	Can breastfeed 10-14 days after delivery	Can breastfeed 10-14 days after delivery
Common side effects	• Moderate reduction of lymphocyte count (Reversible) • Infections	• Infusion reactions • Headache • Increased LFT • Rarely PML	• Infusion reactions • Infections • Autoimmune conditions mainly thyroid disorders
Tolerability	Well tolerated	Well tolerated	Well tolerated
Additional information	Protect from **moisture**	Store between **2 °C and 8 °C** Do NOT freeze	Store between **2 °C and 8 °C** Do NOT freeze

Chemical name	Fingolimod	Ocrelizumab	Ofatumumab
Indication	CIS, moderately and highly active RRMS	CIS, moderately and highly active RRMS, active SPMS, PPMS	CIS, moderately and highly active RRMS, active SPMS
Route of administration	Oral	Infusion	Injection (SC)
Dosage	**0.5 mg** once daily	**600 mg** every 6 months	**20 mg** once per month
Pre-treatment screening	• CBC with differential • ECG • LFTs • VZV serology • Ophthalmic exam/OCT • Serum pregnancy test (women of childbearing age)	• CBC with differential • LFTs • Hepatitis serology panel • Baseline IgG, IgM levels	• CBC with differential • LFTs • Hepatitis serology panel • Baseline IgG, IgM levels
On-treatment monitoring	Blood tests at 3 & 6 months, then regular blood test every 6 months. Ophthalmic exam at 3 months	Blood test every 6 months	Blood test every 6 months
Monitoring burden	Moderate	Low	Low
Relapse-related effectiveness	Intermediate	High	High
Risk of infection	Increased risk of infection	Increased risk of infection	Increased risk of infection
Vaccines	Only inactivated vaccines	Only inactivated vaccines with probable reduced vaccine efficacy	Only inactivated vaccines with probable reduced vaccine efficacy
Pregnancy safety	**Not recommended**	**Pregnancy can be attempted** in the next menstrual cycle after the infusion	**May be** used until conception
Breastfeeding	Not recommended	Can breastfeed 10-14 days after delivery	Can breastfeed 10-14 days after delivery
Common side effects	• Slow heart rate • Cough • Back pain • Increased LFT • Headache • Diarrhea • Infections	• Infections • Infusion reactions • Hypogamma-globulinemia	• Injection site reactions • Infections
Tolerability	Well tolerated	Well tolerated	Well tolerated
Additional information	Contains **beef gelatin**	Contains **mouse sequences**. Store between **2 °C and 8 °C** Do NOT freeze	Store between **2 °C and 8 °C** Do NOT freeze

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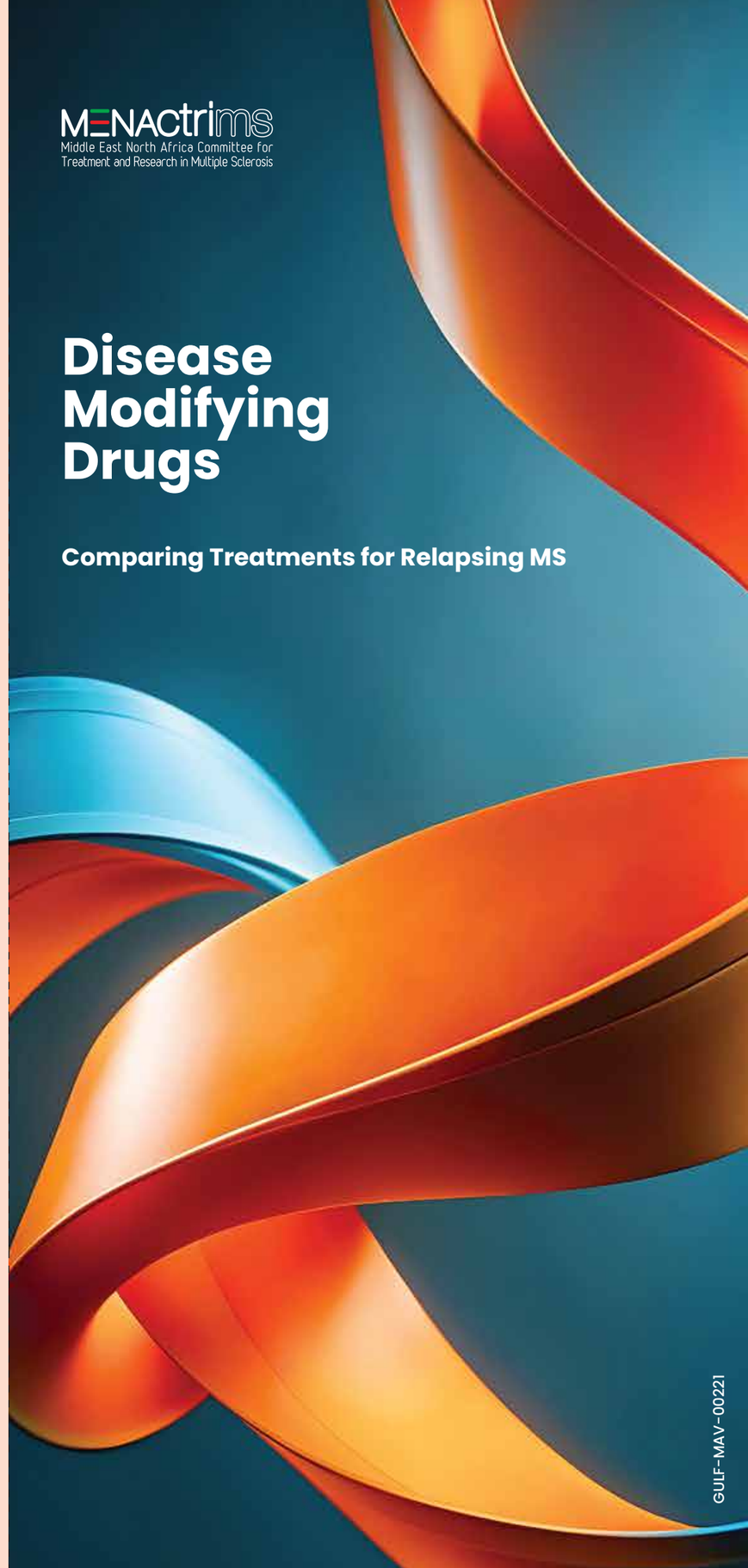
Disease Modifying Drugs

Comparing Treatments for Relapsing MS



GULF-MAV-00221

Chemical name	Interferon β 1a	Interferon β 1b	Peginterferon β
Indication	CIS, moderately active RRMS	CIS, moderately active RRMS	CIS, moderately active RRMS
Route of administration	Injection (IM/SC)	Injection (SC)	Injection (IM)
Dosage	**30 mcg** IM once a week or **44 mcg** SC three times per week	**250 mcg** SC every other day	**125 mcg** every 14 days
Pre-treatment screening	• CBC with differential • LFTs • TSH	• CBC with differential • LFTs • TSH	• CBC with differential • LFTs • TSH
On-treatment monitoring	Blood test every 6 months	Blood test every 6 months	Blood test every 6 months
Monitoring burden	Low	Low	Low
Relapse-related effectiveness	Moderate	Moderate	Moderate
Risk of infection	No	No	No
Vaccines	Possible for live attenuated and inactivated vaccines	Possible for live attenuated and inactivated vaccines	Possible for live attenuated and inactivated vaccines
Pregnancy safety	**Safe** and given when benefit outweighs risk	**Safe** and given when benefit outweighs risk	**Safe** and given when benefit outweighs risk
Breastfeeding	Yes	Yes	Yes
Common side effects	• Influenza-like symptoms • Injection site reactions • Headache • Depression	• Influenza-like symptoms • Injection site reactions • Headache • Depression	• Influenza-like symptoms • Injection site reactions • Headache • Depression
Tolerability	Not well tolerated	Not well tolerated	Not well tolerated
Additional information	Store between **2 °C and 8 °C**	Store at **room temperature**	Store between **2 °C and 8 °C**

Chemical name	Glatiramer acetate	Teriflunomide	Dimethyl Fumarate
Indication	CIS, moderately active RRMS	CIS, moderately active RRMS	CIS, moderately active RRMS
Route of administration	Injection (SC)	Oral	Oral
Dosage	**20 mg** every day	**14 mg** once daily	**240 mg** twice daily
Pre-treatment screening	No pre-treatment testing	• CBC with differential • LFTs • TB screen • Serum pregnancy test (women of childbearing age)	• CBC with differential • LFTs
On-treatment monitoring	No routine monitoring	Blood tests every 3-6 months	Blood & urine test every 3-6 months
Monitoring burden	Low	Moderate	Moderate
Relapse-related effectiveness	Moderate	Moderate	Moderate
Risk of infection	No	Slightly increased risk of infection	No
Vaccines	Possible for live attenuated and inactivated vaccines	Only inactivated vaccines	Only inactivated vaccines
Pregnancy safety	**Safe** and given when benefit outweighs risk	**Contraindicated**	**May** be used until conception
Breastfeeding	Yes	Not recommended	Not recommended
Common side effects	• Injection site reactions • Headache	• Nausea • Abdominal pain • Diarrhea • Hair thinning • Increased LFT • Headache	• Flushing • Nausea • Abdominal pain • Diarrhea
Tolerability	Not well tolerated	Well tolerated	Not well tolerated
Additional information	Store between **2 °C and 8 °C**	Contains **lactose**	Contains **beef gelatin**

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List of Abbreviations

- **CBC** - Complete blood count
- **CIS** - Clinically isolated syndrome
- **ECG** - Electrocardiogram
- **HIV** - Human immunodeficiency virus
- **IgG** - Immunoglobulin G
- **IgM** - Immunoglobulin M
- **IM** - Intramuscular
- **JCV** - John Cunningham virus
- **LFT** - Liver function test
- **OCT** - Optical coherence tomography
- **PML** - Progressive multifocal leukoencephalopathy
- **PPMS** - Primary progressive multiple sclerosis
- **SC** - Subcutaneous
- **SPMS** - Secondary progressive multiple sclerosis
- **TB** - Tuberculosis
- **TSH** - Thyroid stimulating hormone
- **VZV** - Varicella zoster virus

*Defined as highly active disease despite a full and adequate course of treatmentwith at least one DMD or rapidly evolving severe RRMS(≥2 disabling relapses in 1 year, and with 1 or more gadolinium-enhancing lesionsor a significant increase in T2 lesion load as compared to a previous recent MRI)

Disclosure

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References

1. Yamout B, Al-Jumah M, Sharaian M, et al. MENACTRIMS consensus guidelines forthe management of multiple sclerosis in the Middle East and North Africa region.Mult Scler Relat Disord.2024:83:105435. doi: 10.1016/j.msard.2024.105435.

2. Otero-Romero, S., Lebrun-Frénay, C., Reyes, S., et al. ECTRIMS/EAN consensus onvaccination in people with multiple sclerosis: Improving immunization strategies inthe era of highly active immunotherapeutic drugs. Mult Scler Journal. 2023, 29(8),904-925. DOI: 10.1177/13524585231168043.

3. Krysko K, Dobson R, Alroughani R, et al. Family planning considerations in multiplesclerosis. Lancet Neurol. 2023;22(4):350-366. doi: 10.1016/S1474-4422(22)00426-4.