

Main attributes of licensed MS DMTs in relation to the COVID-19 pandemic

At risk category	Class	Trade Name	Mode of action	Efficacy	Class	Safe to start treatment	Advice regarding treatment	In the event of COVID-19 infection?	Immunosuppression?	Attributes and caveats
Very low	Interferon-beta	Betaferon, Avonex, Rebif, Plegridy	Immunomodulatory (not immunosuppressive), pleiotropic immune effects	Moderate	Maintenance immunomodulatory	Yes	Continue	Continue	No	Has antiviral properties that may be beneficial in the case of COVID-19
Very low	Glatiramer acetate	Copaxone	Immunomodulatory (not immunosuppressive), pleiotropic immune effects	Moderate	Maintenance immunomodulatory	Yes	Continue	Continue	No	
Very low	Teriflunomide	Aubagio	Dihydro-orotate dehydrogenase inhibitor (reduced de novo pyrimidine synthesis), anti-proliferative	Moderate (1st-line) / Moderate to high (2nd-3rd-line)	Maintenance immunomodulatory	Yes	Continue	Continue	Possible (no well-defined immunosuppressive signature)	Has antiviral properties that may be beneficial in the case of COVID-19
Low	Dimethyl fumarate	Tecfidera	Pleiotropic, NRF2 activation, downregulation of NFKβ	Moderate (2nd-3rd-line) / High (1st-line)	Maintenance immunosuppressive	Probably	Continue / Switch if lymphopaenic	Continue	Yes, continuous	The risk can only be considered low in patients who don't develop a persistent lymphopaenia. Patients with a total lymphocyte count of less than 800/mm ³ should be considered to be at a higher risk of developing complications from COVID-19 infection.
Low	Natalizumab	Tysabri	Anti-VLA4, selective adhesion molecule inhibitor	Very high	Maintenance immunosuppressive	Yes	Continue	Continue or miss infusion depending on timing	Yes, continuous	Low risk, but theoretical concerns of creating an environment in mucosal surfaces and the gut that may promote prolonged viral shedding. Also risk that as COVID-19/SARS-CoV-2 is neurotropic it may prevent viral clearance from the CNS.
Intermediate	S1P modulators	Fingolimod (Gilenya), Siponimod (Mazent), Ozanimod, Ponesimod	Selective S1P modulator, prevents egress of lymphocytes from lymph nodes	High	Maintenance immunosuppressive	Probably	Continue	Continue or temporary suspension of dosing	Yes, continuous	Theoretical risk that S1P modulators may result in prolonged viral shedding. Paradoxically S1P modulators may reduce the severity of COVID-19; fingolimod is currently being trialed.
Intermediate	Anti-CD20	Ocrelizumab (Ocrevus), Ofatumumab, Rituximab, Ublituximab	Anti-CD20, B-cell depleter	Very high	Maintenance immunosuppressive	Probably	Risk assessment - continue or suspend dosing	Temporary suspension of dosing depending on timing	Yes, continuous	Theoretical risk that ocrelizumab and other anti-CD20 therapies may result in prolonged viral shedding.
Intermediate	Cladribine	Mavenclad	Deoxyadenosine (purine) analogue, adenosine deaminase inhibitor, selective T and B cell depletion	High / Very high (highly-active RMS)	IRT (semi-selective)	Probably	Risk assessment - continue or suspend dosing	Temporary suspension of dosing depending on timing	Yes, intermittent	Theoretical risk that in the immune depletion phase cladribine may result in prolonged viral shedding.
High*	Mitoxantrone	Novatrone	Immune depleter (topoisomerase inhibitor)	Very high	IRT (non-selective)	No	Suspend dosing	Suspend dosing	Yes, intermittent	Theoretical risk that in the immune depletion phase mitoxantrone may result in prolonged viral shedding.
High*	Alemtuzumab	Lemtrada	Anti-CD52, non-selective immune depleter	Very high	IRT (non-selective)	No	Suspend dosing	Suspend dosing	Yes, intermittent	Theoretical risk that in the immune depletion phase alemtuzumab may result in prolonged viral shedding.
High*	HSCT	-	Immune depletion and haemopoietic stem cell reconstitution	Very high	IRT (non-selective)	No	Suspend dosing	Suspend dosing	Yes, intermittent	Theoretical risk that in the immune depletion phase HSCT may result in prolonged viral shedding.

*risk refers to acquiring an infection during the immunodepletion phase. Post immune reconstitution the risk is low.