**Message to GPs from the Neurology Dept. at the L&D**

Dear Doctor

**Re: Covid-19 Outbreak and Neurological patients**

The following document is based on guidance we have received from the **Association of British Neurologists**.

Patients with conditions that do not affect their swallowing or breathing muscles and in whom the immune system is working normally are not considered to be at increased risk from COVID-19. Milder or moderate forms of many of the commoner neurological disorders, such as Parkinson’s disease, multiple sclerosis, epilepsy are not currently considered to be at increased risk, so long as the breathing and swallowing muscles are functioning well.

The risks for a patient are often more defined by their immunotherapy than the underlying individual disease.

**Immunosuppressant medications that could put patients at risk**

For those taking an immunosuppressive drug (**azathioprine, mycophenolate mofetil or methotrexate**) combined with **prednisolone,** there is an increased risk.

The level of risk is uncertain; however any of these drugs combined with **a daily prednisolone dose of 10mg or above is** **considered high risk, and self-isolation is recommended.**

Other risk factors include:

 high doses of immunotherapy

 use of multiple immunotherapies (not necessarily currently)

 active disease

 swallowing or respiratory muscle weakness

 the presence of other co-morbidities, such as interstitial lung disease/pulmonary fibrosis, pulmonary hypertension/pulmonary arterial hypertension, glomerulonephritis/renal impairment (any cause), neutropaenia, lymphopenia, liver disease, diabetes mellitus, ischaemic heart disease, underlying lung disease (such as asthma, chronic obstructive pulmonary disease; COPD), pregnancy and older age.

**Intravenous immunoglobulin** probably does not increase risk.

**General advice related to immunosuppression in neurology patients in individuals without symptoms of COVID-19 infection**

1. People with neurological conditions should not stop or alter their medication without prior discussion with their neurology team.

2. Individuals taking **azathioprine, mycophenolate mofetil, or methotrexate** with or without **prednisolone** should continue to take their tablets as normal. Evidence is limited, but these medications may increase the risk of COVID-19 infection and its complications. However, in almost all cases this risk is outweighed by the benefits of the medication in reducing the chance of a relapse of the neurological condition.

3 For those taking an **immunosuppressive drug (azathioprine, mycophenolate mofetil or methotrexate) combined with prednisolone**, there is an increased risk. The level of risk is uncertain, however any of these drugs combined with a daily prednisolone dose of 10mg or above is considered high risk, and self-isolation is recommended. Combining prednisone up to 9 mg with an immunosuppressive agent increases the risk to medium. Steroids increase risk of diabetes, hypertension and high BMI, which are associated with poor outcomes after COVID-19.

4**. Infliximab/Rituximab/Ocrelizumab**. These infusions moderately increase the risk of viral infections, so individuals may be more prone to COVID-19 and its complications. In many patients this risk is outweighed by the benefits of rituximab in supressing otherwise progressive or severe neurological disease, and the treatment should continue as normal. In all cases the consultant should review the timing of re-treatment and delay treatment if possible or consider alternative options.

5. Reports of possible benefit from **hydroxychloroquine and azithromycin** treatment in COVID-19 infection need to be treated with caution and both may lead to a deterioration in **myasthenia gravis**.

**Specific Neurological Disease Groups**

1. **Multiple sclerosis**

Patients with multiple sclerosis are not significantly at risk from COVID-19, unless they have advanced disability with swallowing or breathing difficulties, or they are receiving selected immunotherapies. Very early unpublished data from China suggests that multiple sclerosis patients may not be at significantly increased risk if they are on Disease Modifying Therapies. We do not recommend that patients stop injectable or oral therapies or natalizumab, as the risk of a relapse of multiple sclerosis exceeds the risk of the medication itself. The risks of COVID-19 infection and its complications are moderately increased with ocrelizumab, so we will not be commencing this treatment, and we are delaying re-treatments, during the epidemic. We advise against autologous haematopoietic stem cell transplantation, as well as alemtuzumab or cladribine treatments and re-treatments, as these represent the highest risk to patients. Patients with serious COVID-19 complications and multiple sclerosis may safely stop their immunotherapy for up to four weeks, after consultation with their MS team.

There is no evidence that increasing the dosing interval for **Natalizumab** from 4 weeks to 6 weeks results in loss of efficacy so we are planning to switch all our patients to 6 weekly dosing to minimise the frequency of hospital attendance for these patients.

**MS Relapse**. High- dose steroids pose an additional risk to patients from Covid-19 and there is no evidence that courses of steroids improve the long-term prognosis in MS. We therefore advise against steroids for treating an MS relapse unless it is extremely severe.

1. **Muscle disease**

Patients with muscle disease may be significantly at risk from COVID-19. Patients with muscular weakness of the chest or diaphragm, resulting in lung volumes less than 60% predicted (FVC <60%) are at significant risk regardless of the underlying diagnosis. Patients with kyphoscoliosis are at additional risk.

We do not recommend that patients with treated active disease routinely stop their medication as the risk of a flare-up exceeds the risk of the medication itself.

**Patients on steroids** should not stop steroids. Some patients actually may need higher steroid doses during acute infection. We would not recommend stopping steroids in Duchenne Muscular Dystrophy patients.

Note that a prednisolone dose of 10mg per day or above is considered an additional risk factor. A patient with a condition with a moderate risk would rise to the high risk group if taking 10 mg prednisolone or above. Steroids increase risk of diabetes, hypertension and high BMI, which are associated with poor outcomes after COVID-19. Patients with acute COVID-19 infection should suspend their immunosuppression but not steroids and restart once recovered.

1. **Peripheral Nerve disease**

Most patients with peripheral neuropathies alone are not at additional risk from COVID-19, except in some special categories. Patients with active disease who are on immunosuppression are at additional risk from the medication. We do not recommend that patients with active disease on medication should routinely stop their medication as the risk of a flare-up exceeds the risk of the medication itself.

**Patients on steroids** should not stop steroids. Some patients may need higher doses during acute infection. A Prednisolone dose of 10mg per day or above should be considered an independent risk factor in increasing a patient risk category. A prednisolone dose of 10-19 mg is a moderate risk. An immunosuppressive combined with prednisolone 10-19 mg is high risk and the patient should self-isolate. A prednisolone dose of 20 mg or greater is high risk. Patients with acute COVID-19 infection should suspend their immunosuppression but not steroids and restart once recovered.

1. **Motor neurone disease**

 Patients with more advanced motor neurone disease are at higher risk from the complications of COVID-19 infection. This is particularly the case for patients with bulbar or respiratory muscle weakness. Patients with muscular weakness of the chest or diaphragm, resulting in lung volumes less than 60% predicted (FVC <60%) are at significant risk as are patients with ventilator support.

1. **Neuromuscular Junction Diseases** e.g. myasthenia gravis

Patients with Neuromuscular Junction (NMJ) Diseases may be significantly at risk from COVID-19. Patients with NMJ-related weakness of the chest or diaphragm, resulting in lung volumes less than 60% predicted (FVC <60%) are at high risk.

 Immunosuppressant medication may further increase the risk from coronavirus. A Prednisolone dose of 20mg per day or above should be considered an independent risk factor increasing a patient from a moderate to a high risk category.

We do not recommend that patients with active disease on medication routinely stop their medication as the risk of a flare-up exceeds the risk of the medication itself.

**Patients on steroids** should not stop steroids and may need higher doses during acute infection. Care may be needed in **increasing doses of prednisolone too rapidly in myasthenia gravis which can increase muscle weakness**. Specialist advice should be sought.

Patients with acute coronavirus infection and myasthenia gravis should **NOT** suspend their immunosuppression but should seek advice from their medical team.

 Colleagues are reminded that there are a number of drugs that may result in deterioration in myasthenia symptoms. ***For a list, check*** [***https://www.myaware.org/drugs-to-avoid***](https://www.myaware.org/drugs-to-avoid).

Reports of a possible benefit from **hydroxychloroquine and azithromycin** treatment in COVID-19 infection need to be treated with caution and both may lead to deterioration in myasthenia gravis.

1. **Inflammatory or autoimmune diseases of the central nervous system** (excluding multiple sclerosis)

Patients with inflammatory or autoimmune diseases of the CNS are not significantly at risk from COVID-19, except if the condition leads to swallowing or respiratory weakness, such as neuromyelitis optica or cerebral vasculitis. Immunosuppressant medication may further increase the risk from coronavirus.

A Prednisolone dose of 20mg per day or above should be considered an independent risk factor placing a patient in the high risk category.

We do not recommend that patients with CNS inflammatory conditions stop immunotherapy because the risks of a relapse are usually greater than the risk of infection. For patients on rituximab, the neurology team may consider delaying re-treatment, except in patients where the risk of relapse may be very high, for instance in neuromyelitis optica spectrum disorders (NMOSD). Patients with serious COVID-19 infection complications should stop their immunotherapy in consultation with their neurology team. In conditions where relapses may be sudden and life-threatening, such as neuromyelitis optica, it may be reasonable to replace immunosuppressive treatments with corticosteroids during a coronavirus infection or, in some rare cases, continue on their immunotherapy where the risk of relapse is high.

1. **Non-inflammatory disorders of the central nervous system**

These conditions do not in themselves render the patient susceptible to infection, however disability, especially bulbar and respiratory failure, or the presence of co-morbidities increase the risk from COVID-19.