# Evidence Search Service Results of your search request

## Covid 19 and cranial nerves

**ID of request:** 23852  
**Date of request:** 19th June, 2020  
**Date of completion:** 19th June, 2020

If you would like to request any articles or any further help, please contact:  Rhys Whelan at [library.morriston@wales.nhs.uk](mailto:library.morriston@wales.nhs.uk)

Please acknowledge this work in any resulting paper or presentation as: Evidence search: Covid 19 and cranial nerves. Rhys Whelan. (19th June, 2020). ABERTAWE/SWANSEA, UK: Bwrdd Iechyd Prifysgol Bae Abertawe Library Services.

**Date range used** (5 years, 10 years): No date range   
**Limits used** (gender, article/study type, etc.): No limits   
**Search terms and notes** (full search strategy for database searches below):

I have searched Medline, Embase and Med Rxiv using the strategy below:

For more information about the resources please go to: <http://www.sblibraryservices.wales.nhs.uk/home>.

## Summary of Results

The search returned few studies. The majority are case reports. Please be aware that some of the papers are from a pre-print server and are awaiting peer review.

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### [B. Search History](#SearchHistory)

## A. Original Research

1. **Coronavirus disease 2019 complicated with Bell’s palsy: a case report**  
   Wan Yue 2020;:No page numbers.

Abstract

1. **COVID-19 presenting with ophthalmoparesis from cranial nerve palsy**  
   Dinkin M. Neurology 2020;01:01.

Neurological complications of COVID-19 are not well described. We report two patients who were diagnosed with COVID-19 after presenting with diplopia and ophthalmoparesis.

1. **COVID-19: A Chronological Review of the Neurological Repercussions - What do We Know by May, 2020?**  
   Mei Paulo Afonso medRxiv 2020;:2020.05.19.20107102.

Abstract Introduction: Despite the new SARS-CoV-2 (COVID-19) be the seventh of the coronavirus family viruses known to cause human disease, little is known about potential symptoms and syndromes secondary to the compromise of the central and peripheral nervous systems. We reviewed neurological manifestations due to the new coronavirus, thus far published in the literature, as well as guidelines issued by sub-specialties in Neurology, to tackle the disease. Methods: we searched medical databases, such as PubMed, PubMed Central, LILACS and Google scholar for papers (case reports, short letters, case series, etc) describing neurological symptoms in patients with confirmed or suspect COVID-19 diagnosis and also searched webpages of associations and organizations that deal with neurological disorders. Results: we describe briefly each article considered for this review. Forty-one papers were found associating neurological conditions and COVID-19. Cases are divided by disease groups and, within each disease group, results are listed in chronological order or publication date. We also discuss briefly recommendations for neurological patients, according to disease group. Conclusion: Although there is evidence of neurological manifestations with previous coronaviruses, COVID-19 is assuring a volume of published papers not seen before for other coronavirus infections. Most neurological cases are not life-threatening, but 10 to 20% of cases will require hospitalization and are in risk for sequelae and death. Although a lot of data coming from these papers is amassing, researchers must bear in mind that many papers currently published are not yet peer-reviewed, and thus are prone to further corrections.Competing Interest StatementThe authors have declared no competing interest.Funding StatementNo fundingAuthor DeclarationsI confirm all relevant ethical guidelines have been followed, and any necessary IRB and/or ethics committee approvals have been obtained.YesAll necessary patient/participant consent has been obtained and the appropriate institutional forms have been archived.YesI understand that all clinical trials and any other prospective interventional studies must be registered with an ICMJE-approved registry, such as ClinicalTrials.gov. I confirm that any such study reported in the manuscript has been registered and the trial registration ID is provided (note: if posting a prospective study registered retrospectively, please provide a statement in the trial ID field explaining why the study was not registered in advance).Yes I have followed all appropriate research reporting guidelines and uploaded the relevant EQUATOR Network research reporting checklist(s) and other pertinent material as supplementary files, if applicable.YesAll data is available in the manuscript

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=41d55aab33aa30d3b358b2b6433f5c21)

1. **Early Guillain-Barré syndrome in coronavirus disease 2019 (COVID-19): a case report from an Italian COVID-hospital**  
   Ottaviani Donatella Neurological Sciences 2020;:1.

1. **Guillain–Barré syndrome associated with leptomeningeal enhancement following SARS-CoV-2 infection**  
   Sancho-Saldaña Agustín Clinical Medicine 2020;:No page numbers.

1. **Involvement of the Nervous System in SARS-CoV-2 Infection**  
   Li H. Neurotoxicity Research 2020;38:1-7.

As a severe and highly contagious infectious disease, coronavirus disease 2019 (COVID-19) has caused a global pandemic. Several case reports have demonstrated that the respiratory system is the main target in patients with COVID-19, but the disease is not limited to the respiratory system. Case analysis indicated that the nervous system can be invaded by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and that 36.4% of COVID-19 patients had neurological symptoms. Importantly, the involvement of the CNS may be associated with poor prognosis and disease worsening. Here, we discussed the symptoms and evidence of nervous system involvement (directly and indirectly) caused by SARS-CoV-2 infection and possible mechanisms. CNS symptoms could be a potential indicator of poor prognosis; therefore, the prevention and treatment of CNS symptoms are also crucial for the recovery of COVID-19 patients.

1. **Neurobiology of COVID-19**  
   Fotuhi Majid Journal of Alzheimer's Disease 2020;:1-17.

Anosmia, stroke, paralysis, cranial nerve deficits, encephalopathy, delirium, meningitis, and seizures are some of the neurological complications in patients with coronavirus disease-19 (COVID-19) which is caused by acute respiratory syndrome coronavirus 2 (SARS-Cov2). There remains a challenge to determine the extent to which neurological abnormalities in COVID-19 are caused by SARS-Cov2 itself, the exaggerated cytokine response it triggers, and/or the resulting hypercoagulapathy and formation of blood clots in blood vessels throughout the body and the brain. In this article, we review the reports that address neurological manifestations in patients with COVID-19, who may present with acute neurological symptoms (e.g., stroke), even without typical respiratory symptoms such as fever, cough, or shortness of breath. Next, we discuss the different neurobiological processes and mechanisms that may underlie the link between SARS-Cov2 and COVID-19 in the brain, cranial nerves, peripheral nerves, and muscles. Finally, we propose a basic “NeuroCovid” classification scheme that integrates these concepts and highlights some of the short-term challenges for the practice of neurology today and the long-term sequalae of COVID-19 such as depression, OCD, insomnia, cognitive decline, accelerated aging, Parkinson’s disease, or Alzheimer’s disease in the future. In doing so, we intend to provide a basis from which to build on future hypotheses and investigations regarding SARS-Cov2 and the nervous system

1. **Neurological manifestations and neuro-invasive mechanisms of the severe acute respiratory syndrome coronavirus type 2**  
   Vonck K. European Journal of Neurology 2020;16:16.

BACKGROUND AND PURPOSE: Infections with coronaviruses are not always confined to the respiratory tract and various neurological manifestations have been reported. The aim of this study was to perform a review to describe neurological manifestations in patients with COVID-19 and possible neuro-invasive mechanisms of Sars-CoV-2.

1. **Neuropathogenesis and Neurologic Manifestations of the Coronaviruses in the Age of Coronavirus Disease 2019: A Review**  
   Zubair A. S. JAMA Neurology. 2020;:No page numbers.

Importance: Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) emerged in December 2019, causing human coronavirus disease 2019 (COVID-19), which has now spread into a worldwide pandemic. The pulmonary manifestations of COVID-19 have been well described in the literature. Two similar human coronaviruses that cause Middle East respiratory syndrome (MERS-CoV) and severe acute respiratory syndrome (SARS-CoV-1) are known to cause disease in the central and peripheral nervous systems. Emerging evidence suggests COVID-19 has neurologic consequences as well. Observations: This review serves to summarize available information regarding coronaviruses in the nervous system, identify the potential tissue targets and routes of entry of SARS-CoV-2 into the central nervous system, and describe the range of clinical neurological complications that have been reported thus far in COVID-19 and their potential pathogenesis. Viral neuroinvasion may be achieved by several routes, including transsynaptic transfer across infected neurons, entry via the olfactory nerve, infection of vascular endothelium, or leukocyte migration across the blood-brain barrier. The most common neurologic complaints in COVID-19 are anosmia, ageusia, and headache, but other diseases, such as stroke, impairment of consciousness, seizure, and encephalopathy, have also been reported. Conclusions and Relevance: Recognition and understanding of the range of neurological disorders associated with COVID-19 may lead to improved clinical outcomes and better treatment algorithms. Further neuropathological studies will be crucial to understanding the pathogenesis of the disease in the central nervous system, and longitudinal neurologic and cognitive assessment of individuals after recovery from COVID-19 will be crucial to understand the natural history of COVID-19 in the central nervous system and monitor for any long-term neurologic sequelae.. Copyright © 2020 American Medical Association. All rights reserved.

1. **Oropharyngeal Dysphagia and Aspiration Pneumonia Following Coronavirus Disease 2019: A Case Report**  
   Aoyagi Y. Dysphagia 2020;12:12.

Cranial nerve involvement is a finding often observed in patients infected with severe acute respiratory syndrome coronavirus 2 during the pandemic outbreak of coronavirus disease 2019 (COVID-19). To our knowledge, this is the first report of oropharyngeal dysphagia associated with COVID-19. A 70-year-old male developed dysphagia and consequent aspiration pneumonia during recovery from severe COVID-19. He had altered sense of taste and absent gag reflex. Videoendoscopy, videofluorography, and high-resolution manometry revealed impaired pharyngolaryngeal sensation, silent aspiration, and mesopharyngeal contractile dysfunction. These findings suggested that glossopharyngeal and vagal neuropathy might have elicited dysphagia following COVID-19. The current case emphasizes the importance of presuming neurologic involvement and concurrent dysphagia, and that subsequent aspiration pneumonia might be overlooked in severe respiratory infection during COVID-19.

1. **Pearls and Oy-sters: Facial nerve palsy as a neurological manifestation of Covid-19 infection**  
   Goh Yihui Neurology 2020;:10.1212/WNL.0000000000009863.

In early March 2020, a previously well 27-year-old gentleman was directly admitted to the isolation ward of a tertiary healthcare center in Singapore with symptoms of myalgia, cough and fever for 4 days. His symptoms started the day after he returned from Spain. He also complained of a new left-sided throbbing headache with no associated photophobia or neck stiffness. On examination, he had mild bilateral conjunctival injection and respiratory examination was unremarkable. He did not have any focal neurologic deficits. Chest radiography did not show any infiltrates and a nasopharyngeal swab returned positive for SARS-CoV-2 on real-time reverse-transcription–polymerase-chain-reaction (RT-PCR) assay.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=4b400ec3c3fb8fd6ee7588da8d900c2e)

1. **Perspectives for the use of therapeutic Botulinum toxin as a multifaceted candidate drug to attenuate COVID-19**  
   Kandasamy Mahesh Medicine in Drug Discovery 2020;:100042.

1. **The neurology of COVID-19 revisited: A proposal from the Environmental Neurology Specialty Group of the World Federation of Neurology to implement international neurological registries**  
   Roman G. C. Journal of the Neurological Sciences 2020;414:116884.

A comprehensive review of the neurological disorders reported during the current COVID-19 pandemic demonstrates that infection with SARS-CoV-2 affects the central nervous system (CNS), the peripheral nervous system (PNS) and the muscle. CNS manifestations include: headache and decreased responsiveness considered initial indicators of potential neurological involvement; anosmia, hyposmia, hypogeusia, and dysgeusia are frequent early symptoms of coronavirus infection. Respiratory failure, the lethal manifestation of COVID-19, responsible for 264,679 deaths worldwide, is probably neurogenic in origin and may result from the viral invasion of cranial nerve I, progressing into rhinencephalon and brainstem respiratory centers. Cerebrovascular disease, in particular large-vessel ischemic strokes, and less frequently cerebral venous thrombosis, intracerebral hemorrhage and subarachnoid hemorrhage, usually occur as part of a thrombotic state induced by viral attachment to ACE2 receptors in endothelium causing widespread endotheliitis, coagulopathy, arterial and venous thromboses. Acute hemorrhagic necrotizing encephalopathy is associated to the cytokine storm. A frontal hypoperfusion syndrome has been identified. There are isolated reports of seizures, encephalopathy, meningitis, encephalitis, and myelitis. The neurological diseases affecting the PNS and muscle in COVID-19 are less frequent and include Guillain-Barre syndrome; Miller Fisher syndrome; polyneuritis cranialis; and rare instances of viral myopathy with rhabdomyolysis. The main conclusion of this review is the pressing need to define the neurology of COVID-19, its frequency, manifestations, neuropathology and pathogenesis. On behalf of the World Federation of Neurology we invite national and regional neurological associations to create local databases to report cases with neurological manifestations observed during the on-going pandemic. International neuroepidemiological collaboration may help define the natural history of this worldwide problem.

### Opening Internet Links

The links to internet sites in this document are 'live' and can be opened by holding down the CTRL key on your keyboard while clicking on the web address with your mouse

### Full text papers

Links are given to full text resources where available. For some of the papers, you will need an **NHS OpenAthens Account**. If you do not have an account you can [register online](https://openathens.nice.org.uk/).

You can then access the papers by simply entering your username and password. If you do not have easy access to the internet to gain access, please let us know and we can download the papers for you.

### Guidance on searching within online documents

Links are provided to the full text of each document. Relevant extracts have been copied and pasted into these results. Rather than browse through lengthy documents, you can search for specific words as follows:

**Portable Document Format / pdf / Adobe**  
Click on the Search button (illustrated with binoculars). This will open up a search window. Type in the term you need to find and links to all of the references to that term within the document will be displayed in the window. You can jump to each reference by clicking it.

**Word documents**  
Select Edit from the menu, the Find and type in your term in the search box which is presented. The search function will locate the first use of the term in the document. By pressing 'next' you will jump to further references.

## B. Search History

## Reviewer’s note 27/6/20:

## Consider adding *exp "cranial nerve disorders"/* subject heading to Medline Search, and repeating search in Embase (with *exp “cranial neuropathy”/* subject heading).

|  | **Source** | **Criteria** | **Results** |
| --- | --- | --- | --- |
| 0. |  | Medline | 0 |
| 1. |  | exp \*betacoronavirus/ or exp \*Coronavirus infection/ | 17556 |
| 2. |  | ((corona\* or corono\*) adj1 (virus\* or viral\* or virinae\*)).ti,ab. | 735 |
| 3. |  | ((novel or new or nouveau or "2019") adj2 (coronavirus\* or "corona virus\*" or coronovirus\* or coronavirinae\*)).ti,ab. | 7076 |
| 4. |  | (Wuhan\* or Hubei\* or Huanan or "2019-nCoV" or 2019nCoV or nCoV2019 or "nCoV-2019" or "COVID-19" or COVID19 or "CORVID-19" or CORVID19 or "WN-CoV" or WNCoV or "HCoV-19" or HCoV19 or CoV or "2019 novel\*" or Ncov or "n-cov" or "SARS-CoV-2" or "SARSCoV-2" or "SARSCoV2" or "SARS-CoV2" or SARSCov19 or "SARS-Cov19" or "SARSCov-19" or "SARS-Cov-19" or Ncovor or Ncorona\* or Ncorono\* or NcovWuhan\* or NcovHubei\* or NcovChina\* or NcovChinese\*).ti,ab. | 32303 |
| 5. |  | (("seafood market\*" or "food market\*") adj10 (Wuhan\* or Hubei\* or China\* or Chinese\* or Huanan\*)).ti,ab. | 66 |
| 6. |  | 1 or 2 or 3 or 4 or 5 | 41818 |
| 7. |  | exp Bell Palsy/ | 1213 |
| 8. |  | exp Cranial Nerves/ | 108744 |
| 9. |  | bell\* palsy.ti,ab. | 2480 |
| 10. |  | facial nerve palsy.ti,ab. | 1912 |
| 11. |  | cranial nerve\*.ti,ab. | 16167 |
| 12. |  | 7 or 8 or 9 or 10 or 11 | 124218 |
| 13. |  | 6 and 12 | 52 |

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