

Medical Guidance & Case Reports

Medical Guidance by Medical Organizations and Government Agencies.
Collection of Peer-Reviewed Published Case Studies

AMERICAN ACADEMY OF NEUROLOGY

COVID-19 and Vaccination in the Setting of Neurologic Disease: An Emerging Issue in Neurology

<https://n.neurology.org/content/early/2021/07/29/WNL.0000000000012578/tab-article-info>

“...However, the rapidity of approval, and history of prior vaccination regimens resulting in neurological and other complications, creates concern surrounding widespread vaccination. This is particularly so in groups with pre-existing neurological conditions...

“Though neurological side effects were not more commonly observed following active vaccine over the extended follow-up period for any of the vaccines, a number of neurological complications of these vaccines are now being reported in the most comprehensive registry, the Vaccine Adverse Events Reporting System (VAERS) database. These include **strokes, cranial neuropathies including Bell’s palsy, tinnitus and trigeminal neuralgia, peripheral neuropathies, dysautonomia, acute disseminated encephalomyelitis, transverse myelitis and AIDP**. Case reports are also starting to emerge in the published literature, and the popular press. Most recently, the possibility of increased risk of **AIDP in the weeks following vaccination** was formally added to the label for the Johnson and Johnson vaccine. These complications are rare when compared to the large number of vaccinated individuals; however, it is too early to know the true incidence and risk factors for these complications. They are thought to be **immune mediated and early recognition and treatment with immunomodulatory therapies might be warranted...**

“Prior studies have shed light on the likelihood of **neurological complications following vaccination**. These data can be difficult to interpret and are often seen as controversial, suffering from potential reporting bias and lack of clear causality, but illustrate theoretical **concerns for both patients and physicians and must be acknowledged.**”

AMERICAN SOCIETY OF HEMATOLOGY

Thrombosis with Thrombocytopenia Syndrome (also termed Vaccine-induced Thrombotic Thrombocytopenia) - Diagnoses and Treatment

<https://www.hematology.org/covid-19/vaccine-induced-immune-thrombotic-thrombocytopenia?fbclid=IwAR2vih2zjmF7k1TeSHHdYSfdEk0ZQKHp7oae-ksakg6lhTV-s3zYfeJ0VWg>

“If thrombocytopenia or thrombosis are present, recommend **urgent consultation** from hematologist with expertise in hemostasis. **Avoid use of heparin until TTS has been ruled out** or until an alternative other plausible diagnosis has been made. Knowledge about TTS continues to evolve, and updates will be made as new data become available.

“To date, TTS appears far more likely following AstraZeneca/Johnson and Johnson adenoviral vaccines than Moderna/Pfizer mRNA vaccines..”

MAYO CLINIC

COVID-19 Vaccine Precautions

<https://www.mayoclinic.org/drugs-supplements/sars-cov-2-covid-19-vaccine-mrna-1np-spike-protein-moderna-intramuscular-route/precautions/drg-20505150>

“This vaccine may cause serious **allergic reactions, including anaphylaxis**, which can be life-threatening and requires immediate medical attention. Tell your doctor right away if you have a **rash, itching, a fast heartbeat, trouble breathing, trouble swallowing, or any swelling of your hands, face, or mouth** after receiving the vaccine.

“This vaccine may increase your risk of **serious heart problems (eg, myocarditis, pericarditis)**, especially after you receive the second dose. Check with your doctor right away if you have **anxiety, blue or pale skin, chest pain, possibly moving to the left arm, neck, or shoulder, fever, chills, a fast heartbeat, trouble breathing, or unusual tiredness or weakness**.

“**Fainting** may occur after you receive this vaccine. You may also have **vision changes, numbness or tingling in your arms, hands, or feet, or jerky movements of the arms and legs**. Your doctor may want you to be observed after you get the injection to prevent and manage fainting.

“This vaccine may not protect everyone who receives it...”

GOVERNMENT OF CANADA

Reported side effects following COVID-19 vaccination in Canada (reported adverse events of special interest)

<https://health-infobase.canada.ca/covid-19/vaccine-safety/>

Auto-immune diseases: Guillain-Barré Syndrome, Thrombocytopenia (low blood platelets)

Cardiovascular system: Cardiac arrest, Cardiac failure, Myocardial infarction (heart attack), Myocarditis/Pericarditis (inflammation of the heart muscle and lining around the heart)

Circulatory system: Cerebral venous (sinus) thrombosis, Cerebral thrombosis, Cutaneous vasculitis, Deep vein thrombosis, Embolism, Haemorrhage (bleeding), Pulmonary embolism, Thrombosis (blood clot), Thrombosis with thrombocytopenia syndrome (blood clot with low platelets)

Hepato-gastrointestinal and renal system: Acute kidney injury, Glomerulonephritis (kidney inflammation) and nephrotic syndrome (kidney disorder), Liver injury

Nerves and central nervous system: Bell's Palsy/facial paralysis, Cerebrovascular accident (stroke), Transverse myelitis (inflammation of spinal cord)Anaphylaxis

Pregnancy outcomes: Fetal growth restriction, Spontaneous abortion

Respiratory system: Acute respiratory distress syndrome

Skin and mucous membrane, bone and joints system: Chilblains, Erythema multiforme (immune skin reaction)

FDA APPROVED COMIRNATY PACKAGE INSERT -

<https://www.fda.gov/media/151707/download>

Cardiac Disorders: myocarditis, pericarditis

Gastrointestinal Disorders: diarrhea, vomiting

Immune System Disorders: severe allergic reactions, including anaphylaxis, and other hypersensitivity reactions (e.g., rash, pruritus, urticaria, angioedema)

Musculoskeletal and Connective Tissue Disorders: pain in extremity

CDC - CLINICAL CONSIDERATIONS

<https://www.cdc.gov/vaccines/covid-19/clinical-considerations/covid-19-vaccines-us.html>

People with a history of Guillain-Barré syndrome

“Reports of adverse events following use of the Janssen COVID-19 vaccine under EUA suggest an increased risk of GBS during the 42 days following vaccination. No increased risk of GBS has been identified with mRNA vaccines during use under EUA.”

People with a history of Bell's palsy

“Cases of Bell's palsy (acute peripheral facial nerve palsy) were reported following vaccination of participants in the COVID-19 vaccine clinical trials...people with a history of Bell's palsy may receive any currently FDA-authorized COVID-19 vaccine.”

People with a history of dermal filler use

“Infrequently, people who have received dermal fillers might experience swelling at or near the site of filler injection (usually face or lips) following administration of a dose of an mRNA COVID-19 vaccine... The swelling appears to be temporary and resolves with medical treatment, including corticosteroid therapy.”

People with a history of thrombosis or risk factors for thrombosis

“Although the etiology of TTS associated with the Janssen COVID-19 vaccine is unclear, it appears to be similar to another **rare immune-mediated syndrome**, heparin-induced thrombocytopenia (HIT). Until more information becomes available, experts advise that people with a history of an episode of an immune-mediated syndrome characterized by thrombosis and thrombocytopenia, such as HIT, should be offered another currently FDA-authorized COVID-19 vaccine (i.e., mRNA vaccine) if it has been ≤ 90 days since their TTS resolved. After 90 days, patients may be vaccinated with any currently FDA-authorized COVID-19 vaccine.

Venous thromboembolism (VTE), defined as deep vein thrombosis, pulmonary embolism, or both, are common. The biologic mechanisms for VTE (as well as arterial thrombi) differ from the underlying immune-mediated mechanism for HIT. Based on current knowledge, experts believe that people with risk factors for VTE (e.g., inherited or acquired thrombophilia including Factor V Leiden; prothrombin gene 20210A mutation; antiphospholipid syndrome; protein C, protein S or antithrombin deficiency), or a prior history of other types of thromboses (including cerebral venous sinus thrombosis [CVST]) not associated with thrombocytopenia are unlikely to be at increased risk for TTS. Likewise, although the risk of thrombosis is increased during pregnancy and the postpartum period, and with certain hormonal contraceptives (e.g., combined oral contraceptives, patch, and ring), experts believe that these factors do not make people more susceptible to TTS after receipt of the Janssen COVID-19 vaccine. People with risk factors for VTE can receive any currently FDA-authorized vaccine, including the Janssen COVID-19 vaccine.

People with a history of myocarditis or pericarditis

“Myocarditis (inflammation of the heart muscle) or pericarditis (inflammation of the lining around the heart) have occurred in some people following receipt of mRNA COVID-19 vaccines (Pfizer-BioNTech and Moderna)... Cases of myocarditis or pericarditis have occurred predominantly in males aged 12-29 years within a few days after receiving the second dose of vaccine. **Most patients have required hospitalization with resolution of acute symptoms. Follow-up is ongoing to identify and understand potential long-term outcomes among cases.**

“There are limited data on the safety and efficacy of COVID-19 vaccines in people with a history of myocarditis or pericarditis...

“Myocarditis or pericarditis after receipt of the first dose of an mRNA COVID-19 vaccine series but before administration of the second dose...” It is unclear if people who developed myocarditis or pericarditis after a first dose of an mRNA COVID-19 vaccine may be at increased risk of further adverse cardiac effects following a second dose of the vaccine. **Until additional safety data are available, experts recommend that people who develop myocarditis or pericarditis after a first dose of an mRNA COVID-19 vaccine defer receiving the second dose.**

“People with a history of myocarditis or pericarditis who choose to receive the second dose of an mRNA COVID-19 vaccine should wait at least until their episode of myocarditis or pericarditis has completely resolved.”

Considerations involving pregnancy, lactation, and fertility

“...women aged <50 years should be aware of the rare risk of TTS after receipt of the Janssen COVID-19 vaccine and the availability of other currently FDA-authorized COVID-19 vaccines (i.e., mRNA vaccines) for which this risk has not been seen...There is no evidence that any of the COVID-19 vaccines affect current or future fertility.”

COVID VACCINES ARE NOT FREE OF NEUROLOGICAL SIDE EFFECTS

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8206845/>

“...The most common neurological symptoms included **dizziness, headache, pain, muscle spasms, myalgia and paresthesias**, which are expected to occur as acute, transient effects of the vaccination. Rare cases of **tremor, diplopia, tinnitus, dysphonia, seizures and reactivation of herpes zoster have been also reported**. There were also cases of **stroke, GBS, facial palsy, transverse myelitis and acute disseminated encephalomyelitis (ADEM)** in the VAERS database...In the coronavirus vaccine trial, 2 patients with **transverse myelitis** were reported. **Facial palsy** has been also reported in a study of patients undergoing a SARS-CoV-2 vaccination with mRNA-based vaccines. There is also one report about a **deep venous thrombosis (DVT)** following the second dose of an mRNA vaccine. Since DVT is a potential risk factor for ischemic stroke in case of a patent foramen ovale (PFO), **we should recognize** that venous thrombosis as a potential side effect of SARS-CoV-2 vaccines **may secondarily concern also the neurologist**.

“In addition to these publications, we observed several patients with **neurological compromise**, in whom it was conceivable that neurological compromise was causally related to a recent SARS-CoV-2 vaccination.”

PUBLISHED CASE STUDIES:

Neurological:

Small fiber neuropathy: <https://onlinelibrary.wiley.com/doi/10.1002/mus.27251?fbclid=IwAR2pqg6XDZIGuPZp8n0rcHWedMERMdHdeuTJhanEtpYiYVAEeSioqBQ>

18 cases of idiopathic sensorineural hearing loss, tinnitus, and/or vertigo following Moderna/Pfizer: <https://pubmed.ncbi.nlm.nih.gov/34267103/>

POTS: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8101507/?fbclid=IwAR1DWjqDhAUyjg3U1B6kMvJLBliLoo5UB58_i4NTyo51pFZRzTKtLdj_aj8

General Neuro side effects: https://onlinelibrary.wiley.com/doi/full/10.1111/ane.13451?fbclid=IwAR1CemFwLUpSMK19GMZa_xPF775Q4B0IiksbrziKUplrRXhYR5cDQFFfVAQ

Trigeminal Neuralgia and cervical radiculitis after Pfizer: <https://pubmed.ncbi.nlm.nih.gov/34155020/>

Facial Palsy: <https://academic.oup.com/fampra/advance-article-abstract/doi/10.1093/fampra/cmab068/6311086>

Bilateral facial weakness with paresthesia variant of GBS following AstraZeneca: <https://pubmed.ncbi.nlm.nih.gov/34261746/>

Facial Weakness, extremity weakness, encephalopathy, and severe refractory ITP following Moderna: <https://pubmed.ncbi.nlm.nih.gov/33854395/>

Facial Palsy: <https://academic.oup.com/.../10.1093/fampra/cmab068/6311086>

36yo with Bells Palsy, left arm tingling/numbness/weakness following mRNA vaccination: <https://pubmed.ncbi.nlm.nih.gov/34336436/>

50yoM with Bells Palsy after Pfizer, ongoing symptoms after 21 days: <https://pubmed.ncbi.nlm.nih.gov/34330676/>

21yoF nurse with Bells Palsy following Pfizer: <https://pubmed.ncbi.nlm.nih.gov/34322761/>

61yoM with Bells Palsy after each dose of Pfizer: <https://pubmed.ncbi.nlm.nih.gov/34281950/>

57yoF with Bells Palsy <36 hours after 2nd dose of Pfizer: <https://pubmed.ncbi.nlm.nih.gov/33594349/>

34yoF with Bells Palsy 2 days after Moderna: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8143982/>

Transient akathisia after Pfizer:
<https://pubmed.ncbi.nlm.nih.gov/34113842/>

Phantosmia: <https://pubmed.ncbi.nlm.nih.gov/34096896/>

Neuromyelitis optica spectrum disorder (NMOSD): [https://link.springer.com/article/10.1007/s10072-021-05427-4?](https://link.springer.com/article/10.1007/s10072-021-05427-4?fbclid=IwAR2DGcW8Y5UxvdzcOQaBUPn6_RTZGQRSsNo6bzanyAm9yN6387E3Z6WrKII)
[fbclid=IwAR2DGcW8Y5UxvdzcOQaBUPn6_RTZGQRSsNo6bzanyAm9yN6387E3Z6WrKII](https://link.springer.com/article/10.1007/s10072-021-05427-4?fbclid=IwAR2DGcW8Y5UxvdzcOQaBUPn6_RTZGQRSsNo6bzanyAm9yN6387E3Z6WrKII)

Patient's first MS Flare following Pfizer:
<https://link.springer.com/article/10.1007/s00415-021-10648-w>

MS Flare following AZ: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8205198/>

Myasthenia Gravis Flare Following Moderna: <https://www.cureus.com/articles/60348-a-case-of-covid-19-vaccine-causing-a-myasthenia-gravis-crisis>

CVA and Thrombocytopenia following Astrazeneca:
<https://pubmed.ncbi.nlm.nih.gov/34175640/>

Cerebral Venous sinus thrombosis, review of European cases:
<https://pubmed.ncbi.nlm.nih.gov/34293217/>

45 cases of Cerebral Venous thrombosis:
<https://pubmed.ncbi.nlm.nih.gov/34288044/>

Severe dyskinesia in Parkinson Patient following mRNA vaccination: <https://pubmed.ncbi.nlm.nih.gov/34368991/>

Two cases of encephalopathy and seizures following Moderna: <https://pubmed.ncbi.nlm.nih.gov/34367780/>

Tinnitus/Hearing Disturbances: <https://jamanetwork.com/journals/jamaotolaryngology/fullarticle/2780288>

Worsening Neuro-Oncologic Disease Symptoms following mRNA vaccination: <https://www.cureus.com/articles/61880-new-onset-neurologic-symptoms-and-related-neuro-oncologic-lesions-discovered-after-covid-19-vaccination-two-neurosurgical-cases-and-review-of-post-vaccine-inflammatory-responses>

Autoimmunity:
https://res.mdpi.com/d_attachment/vaccines/vaccines-09-00435/article_deploy/vaccines-09-00435-v2.pdf

GBS following Johnson and Johnson: <https://www.onlinescientificresearch.com/articles/the-development-of-guillain-barre-syndrome-subsequent-to-administration-of-ad26cov2s-vaccine.pdf>

4 cases of GBS following Astra Zeneca: <https://pubmed.ncbi.nlm.nih.gov/34114269/>

GBS in elderly gentleman following 2nd dose of Pfizer: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8253659/>

GBS following Pfizer: <https://pubmed.ncbi.nlm.nih.gov/34347563/>

GBS after the first dose of Pfizer: <https://pubmed.ncbi.nlm.nih.gov/33758714/>

GBS in a 25 yoF following 2nd dose of Pfizer: <https://pubmed.ncbi.nlm.nih.gov/34346014/>

GBS 10 days after AstraZeneca: <https://pubmed.ncbi.nlm.nih.gov/34272622/>

GBS 11 days after AstraZeneca: <https://pubmed.ncbi.nlm.nih.gov/34187803/>

GBS following AstraZeneca: <https://pubmed.ncbi.nlm.nih.gov/34330729/>

7 cases of GBS following AstraZeneca: <https://pubmed.ncbi.nlm.nih.gov/34114256/>

Delirium in an elderly patient following Pfizer: <https://onlinelibrary.wiley.com/doi/10.1111/ggi.14163>

Ophthalmology:

Visual Disturbances:

<https://link.springer.com/article/10.1007/s00011-021-01476-9>

Acute Macular Neuroretinopathy after AstraZeneca:

[https://www.nature.com/articles/s41433-021-01610-1.epdf?](https://www.nature.com/articles/s41433-021-01610-1.epdf?fbclid=IwAR1PuBuxzldyCMPxFNRGsTbLL6YZw9zMBOROorfHrXAPoAOh_-d5rYdyWVc)

[fbclid=IwAR1PuBuxzldyCMPxFNRGsTbLL6YZw9zMBOROorfHrXAPoAOh_-d5rYdyWVc](https://www.nature.com/articles/s41433-021-01610-1.epdf?fbclid=IwAR1PuBuxzldyCMPxFNRGsTbLL6YZw9zMBOROorfHrXAPoAOh_-d5rYdyWVc)

Acute Central Serous Retinopathy after Pfizer: <https://pubmed.ncbi.nlm.nih.gov/34151047/>

Panuveitis: <https://pubmed.ncbi.nlm.nih.gov/34213988/>

Anterior Uveitis following Pfizer: <https://pubmed.ncbi.nlm.nih.gov/34289406/>

Reduction of Visual Acuity following Pfizer: [https://link.springer.com/article/10.1007/s00011-021-01476-9?](https://link.springer.com/article/10.1007/s00011-021-01476-9?fbclid=IwAR3zAvenOwPAZmuVsx9CM7bFwOliHerfJK3M3nQCMe-3BWoT4QdNCWK7cNo)

[fbclid=IwAR3zAvenOwPAZmuVsx9CM7bFwOliHerfJK3M3nQCMe-3BWoT4QdNCWK7cNo](https://link.springer.com/article/10.1007/s00011-021-01476-9?fbclid=IwAR3zAvenOwPAZmuVsx9CM7bFwOliHerfJK3M3nQCMe-3BWoT4QdNCWK7cNo)

Rheumatology/Endocrinology:

Subacute thyroiditis: <https://www.tandfonline.com/doi/abs/10.1080/21645515.2021.1947102>

Immune mediated disease flares: <https://pubmed.ncbi.nlm.nih.gov/33946748/>

Lupus exacerbation: <https://onlinelibrary.wiley.com/doi/10.1111/dth.15017>

Lupus exacerbation following mRNA vaccination: <https://pubmed.ncbi.nlm.nih.gov/34291477/>

2 reports of Graves Disease following Pfizer:
[https://www.liebertpub.com/doi/pdf/10.1089/thy.2021.0142?](https://www.liebertpub.com/doi/pdf/10.1089/thy.2021.0142?fbclid=IwAR06kBQuAQ5ccxnAG2mgRNUjlmeiq715zfYAqrz3qvNWQCLoM9sbJdwzm7c&)
[fbclid=IwAR06kBQuAQ5ccxnAG2mgRNUjlmeiq715zfYAqrz3qvNWQCLoM9sbJdwzm7c&](https://www.liebertpub.com/doi/pdf/10.1089/thy.2021.0142?fbclid=IwAR06kBQuAQ5ccxnAG2mgRNUjlmeiq715zfYAqrz3qvNWQCLoM9sbJdwzm7c&)

Hyperglycemic crisis: <https://onlinelibrary.wiley.com/doi/abs/10.1111/dme.14631>

2 reports of Graves Disease following Pfizer: [https://www.liebertpub.com/doi/pdf/10.1089/thy.2021.0142?](https://www.liebertpub.com/doi/pdf/10.1089/thy.2021.0142?fbclid=IwAR06kBQuAQ5ccxnAG2mgRNUjlmeiq715zfYAqrz3qvNWQCLoM9sbJdwzm7c&)
[fbclid=IwAR06kBQuAQ5ccxnAG2mgRNUjlmeiq715zfYAqrz3qvNWQCLoM9sbJdwzm7c&](https://www.liebertpub.com/doi/pdf/10.1089/thy.2021.0142?fbclid=IwAR06kBQuAQ5ccxnAG2mgRNUjlmeiq715zfYAqrz3qvNWQCLoM9sbJdwzm7c&)

Rash, arthritis, swelling, muscle weakness following AstraZeneca: <https://onlinelibrary.wiley.com/doi/abs/10.1002/jmv.27175>

Reactivation of IgA vasculitis following Moderna: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8260100/>

40yoF with Henoch-Schonlein Purpura following Pfizer: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8241653/>

GI:

Gastroparesis following Pfizer: https://journals.lww.com/ajg/Citation/9900/Gastroparesis_After_Pfizer_BioNTech_COVID_19.28.aspx

Autoimmune hepatitis following Moderna: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8197609/>

Autoimmune hepatitis following Moderna: [https://www.journal-of-hepatology.eu/article/S0168-8278\(21\)00424-4/fulltext](https://www.journal-of-hepatology.eu/article/S0168-8278(21)00424-4/fulltext)

Autoimmune hepatitis after mRNA vaccine (Moderna):
<https://www.sciencedirect.com/science/article/pii/S0168827821018961?via%3Dihub>

Autoimmune hepatitis following Pfizer:
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8186938/>

Autoimmune hepatitis (Pfizer):
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8056822/>

Autoimmune hepatitis (Pfizer):
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8256942/>

63yoM with autoimmune hepatitis following Moderna:
<https://pubmed.ncbi.nlm.nih.gov/34293683/>

35yoF with autoimmune hepatitis following Pfizer:
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8056822/>

63yoM with autoimmune hepatitis following Moderna:
<https://pubmed.ncbi.nlm.nih.gov/34293683/>

Liver injury in a liver transplant patient following mRNA vaccination: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8214934/>

Pancreatitis: <https://pubmed.ncbi.nlm.nih.gov/34084669/>

Renal:

IgA Nephropathy after mRNA vaccine: <https://pubmed.ncbi.nlm.nih.gov/34278290/>

ANCA glomerulonephritis after Moderna:
[https://www.kidney-international.org/article/S0085-2538\(21\)00555-X/fulltext](https://www.kidney-international.org/article/S0085-2538(21)00555-X/fulltext)

Nephrotic Syndrome following AstraZeneca:
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8257404/>

Nephrotic syndrome and vasculitis following Pfizer, Moderna, and AstraZeneca:
<https://academic.oup.com/ndt/advance-article/doi/10.1093/ndt/gfab215/6318785>

De novo vasculitis after Moderna:
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8166777/>

Minimal Change disease and Severe AKI following AstraZeneca:
<https://pubmed.ncbi.nlm.nih.gov/34242687/>

Minimal Change Disease Following Pfizer: <https://pubmed.ncbi.nlm.nih.gov/33839200/>

Minimal Change Disease relapse following Pfizer:
[https://www.ajkd.org/article/S0272-6386\(21\)00627-2/fulltext](https://www.ajkd.org/article/S0272-6386(21)00627-2/fulltext)

MCD relapse following Pfizer: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8137360/>

MCD relapse following Pfizer: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8098029/>

Severe MCD relapse 3 days following Pfizer: <https://europepmc.org/article/pmc/pmc8156905>

Minimal change disease and AKI following Pfizer:
[https://www.kidney-international.org/article/S0085-2538\(21\)00493-2/pdf](https://www.kidney-international.org/article/S0085-2538(21)00493-2/pdf)

Minimal Change disease following Moderna:
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8149162/>

IgA nephropathy in 2 pediatric patients after Pfizer:
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8256683/>

IgA and crescentic glomerulonephritis following Pfizer:
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8141343/>

3 cases of IgA nephropathy patients developing exacerbations following mRNA vaccine:
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8166778/>

2 cases of IgA nephropathy patients developing exacerbations following moderna:
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7987498/>

IgA nephropathy flare up following Moderna:
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8079938/>

IgA Nephropathy after mRNA vaccine: <https://pubmed.ncbi.nlm.nih.gov/34278290/>
ITP following Astrazeneca: <https://ashpublications.org/blood/article/doi/10.1182/blood.2021012790/476455/Immune-Thrombocytopenic-Purpura-after-vaccination>

IgA nephropathy in 2 pediatric patients after Pfizer:
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8256683/>

2 cases of IgA Nephropathy patients developing hematuria after Pfizer:
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8329426/>

New onset ANCA vasculitis after Pfizer: <https://pubmed.ncbi.nlm.nih.gov/34280507/>

Hematology/Oncology:

Thrombosis with Thrombocytopenia following Moderna:
<https://www.acpjournals.org/doi/full/10.7326/L21-0244>

TTP Following Pfizer: <https://pubmed.ncbi.nlm.nih.gov/34264514/>

DVT and PE and positive HIT panel following mRNA Vaccine:
<https://pubmed.ncbi.nlm.nih.gov/34117206/>

Superior ophthalmic Vein Thrombosis and Thrombocytopenia following AstraZeneca:
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8265377/>

Autoimmune hemolytic anemia: <https://pubmed.ncbi.nlm.nih.gov/34150386/>

Autoimmune hemolytic anemia following Pfizer: <https://pubmed.ncbi.nlm.nih.gov/34258873/>

ITP Exacerbation in 12% of chronic patients: <https://pubmed.ncbi.nlm.nih.gov/34075578/>

ITP Exacerbation in previous stable patient following Pfizer:
<https://academic.oup.com/ofid/advance-article/doi/10.1093/ofid/ofab343/6308965>

ITP following Pfizer: <https://pubmed.ncbi.nlm.nih.gov/34155844/>

3 cases of ITP following Pfizer and Astra Zeneca:
<https://www.mjhid.org/index.php/mjhid/article/view/4669/4043>

Treatment Guide to Thrombotic Thrombocytopenia Following Vaccination: <https://www.hematology.org/covid-19/vaccine-induced-immune-thrombotic-thrombocytopenia>

36 Cases of ITP following Pfizer and Moderna:
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8011062/>

20 cases of Thrombocytopenia following Pfizer and Moderna:
<https://onlinelibrary.wiley.com/doi/10.1002/ajh.26132>

84yoM with ITP following Pfizer: <https://link.springer.com/article/10.1007/s11739-021-02778-w>

41yoF with ITP following Pfizer: <https://casereports.bmj.com/content/14/5/e242220>

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<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8204135/>

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<https://pubmed.ncbi.nlm.nih.gov/34269723/>

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<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8270733/>

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<https://pubmed.ncbi.nlm.nih.gov/34310793/>

Pericarditis following mRNA vaccination: <https://pubmed.ncbi.nlm.nih.gov/34364831/>

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A case series of Pityriasis rosea following vaccination: <https://pubmed.ncbi.nlm.nih.gov/34363731/>

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New onset lichen planus following Pfizer: <https://onlinelibrary.wiley.com/doi/10.1111/jdv.17504>

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Small vessel vasculitis after Astra Zeneca: <https://pubmed.ncbi.nlm.nih.gov/34310763/>

Pfizer induced reactivation of varicella and resulting small vessel vasculitis: <https://pubmed.ncbi.nlm.nih.gov/34310759/>

2 cases of skin color discoloration following mRNA vaccination: <https://pubmed.ncbi.nlm.nih.gov/34310755/>

A case series of rare cutaneous adverse events following vaccination: <https://pubmed.ncbi.nlm.nih.gov/34363637/>

3 cases of vesiculobullous non-IgE-mediated cutaneous reactions to Pfizer: <https://pubmed.ncbi.nlm.nih.gov/34363258/>

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Rhabdomyolysis after Moderna: <https://pubmed.ncbi.nlm.nih.gov/34150372/>

Concerns about the lipid nanoparticle in the mRNA contributing to adverse reactions: <https://www.biorxiv.org/content/10.1101/2021.03.04.430128v1.full?fbclid=IwAR2yUJH9kAb01O2PJ46AfBvQANuGiQvZd3ROs4R8qNJF6CZ4f255hDdRsSY>

WORLD HEALTH ORGANIZATION

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“Children and adolescents tend to have milder disease compared to adults, so unless they are part of a group at higher risk of severe COVID-19, it is less urgent to vaccinate them than older people, those with chronic health conditions and health workers.

More evidence is needed on the use of the different COVID-19 vaccines in children to be able to make general recommendations on vaccinating children against COVID-19.”