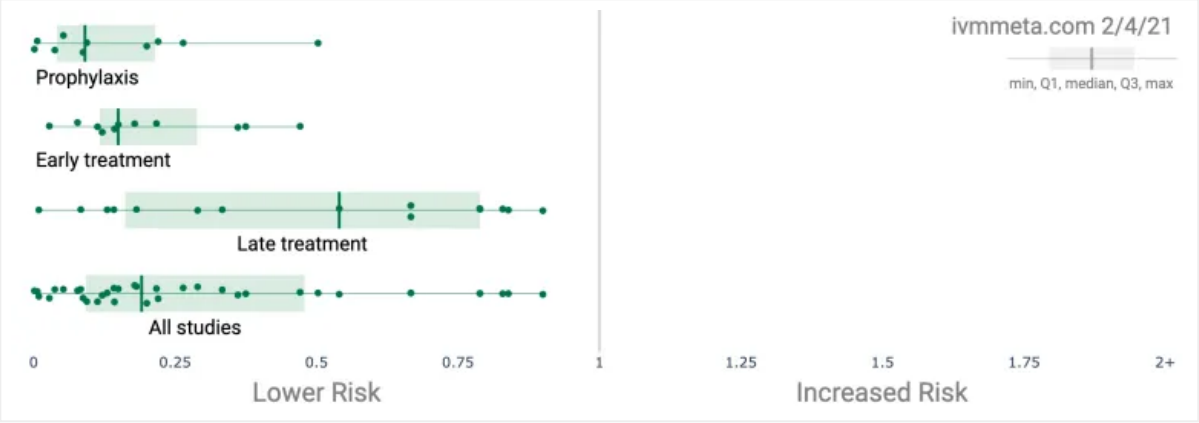
Swiss Policy Research

On the Treatment of Covid-19



Effectiveness of ivermectin against covid-19 (IVMMETA)

Updated: April 2021
Languages: German, English
Share on: Twitter / Facebook

Based on the available scientific evidence and current clinical experience, the SPR Collaboration recommends that physicians and authorities consider the following covid-19 treatment protocol for the **prophylactic and early treatment** of people at high risk or high exposure.

Numerous international studies have shown that prophylactic and early treatment can significantly reduce the risk of severe or fatal covid-19 (see scientific references below).

Note: Patients are asked to consult a doctor.

Treatment protocol

Prophylaxis

1. Ivermectin (12mg once per week)*
2. Bromhexine (16mg to 24mg per day)*
3. Vitamin D3 (2000 IU per day)
4. Zinc (25mg to 50mg per day)
5. Quercetin (250mg per day)
6. Mouthwashes and nasal sprays (PVI)

Early treatment

1. Ivermectin (18mg per day for 2-5 days)*
2. Bromhexine (50mg to 100mg per day)*
3. Aspirin (162mg to 325mg per day)*
4. Zinc (75mg to 100mg per day)
5. Vitamin D3 (5000 IU per day)*
6. Quercetin (500mg per day)
7. Mouthwashes and nasal sprays (PVI)

Other (prescription only)

1. High-dose vitamin D (up to 100,000 IU)*
2. Hydroxychloroquine (400mg per day)*
3. Azithromycin (up to 500mg per day)
4. Steroids: Prednisone or budesonide*
5. Monoclonal antibody treatment

(*) Notes:

Contraindications for **aspirin**, **bromhexine, ivermectin and HCQ** must be observed. **Bromhexine** is available prescription-free in most of Europe, but not in the US. **Corticosteroids** (prednisone, budesonide) are to be used if respiratory symptoms develop. For early treatment, **vitamin D** should be used in its fast-acting form, calcifediol. Contrary to media claims, correctly dosed **HCQ** has been shown to be effective and safe for the early treatment of covid-19 (see references below).

See also

- FLCCC Covid-19 Prophylaxis and Treatment Protocols (FLCCC, April 2021)
- Early Outpatient Treatment of COVID-19 (McCullough et al., October 2020)
- Covid-19 Early Treatment Study Overview (c19early.com, April 2021)

Treatment successes

For more results, see the full scientific references at the bottom of this page.

Ivermectin

- Ivermectin has shown strong anti-viral and anti-inflammatory effects in numerous controlled and observational studies, reducing covid mortality even in severe cases by up to 90%.
- A preliminary WHO meta-analysis found that ivermectin reduces covid mortality by 75%.
- A US-Canadian study published in Nature Communications Biology showed that ivermectin strongly (>90%) inhibits the main coronavirus replication enzyme (3CLpro).
- In a study of 33 “long covid” patients, treatment with ivermectin resulted in complete resolution of symptoms in 89% of patients.
- Based on these results, the US Front-Line Covid-19 Critical Care Alliance (FLCCC) recommends ivermectin for covid-19 prophylaxis and early treatment.
- If not available locally, ivermectin can be bought from certified Indian pharmaceutical exporters on Indiamart. However, some countries may not allow its importation.

Zinc

- US physicians reported an 84% decrease in hospitalizations, a 45% decrease in mortality among already hospitalized patients, and an improvement in the condition of patients within 8 to 12 hours based on early treatment with zinc in addition to HCQ.
- A Spanish study found that low plasma zinc levels (below 50mcg/dl) increased the risk of in-hospital death of covid patients by 130%.
- A US study reported a rapid resolution (within hours) of covid symptoms, such as shortness of breath, based on early outpatient treatment with high-dose zinc.

Bromhexine

- Iranian doctors reported in a study with 78 patients a decrease in intensive care treatments of 82%, a decrease in intubations of 89%, and a decrease in deaths of 100%.
- Chinese doctors reported a 50% reduction in intubations due to bromhexine treatment.
- A Russian study found a significantly faster recovery in hospitalized patients receiving bromhexine.
- A Russian prophylaxis study found a reduction in symptomatic covid from 20% to 0%.
- A German study discusses the efficacy of bromhexine based on biochemical aspects.

Vitamin D

- In a Spanish randomized controlled trial (RCT), high-dose vitamin D (100,000 IU) reduced the risk of requiring intensive care by 96%.
- Another randomized trial in Spain with 930 hospitalized patients found a reduction in ICU treatment by 80% and in mortality by 60% in patients receiving high-dose vitamin D.
- A study in a French nursing home found an 89% decrease in mortality in residents who had received high-dose vitamin D either shortly before or during covid-19 disease.
- A retrospective British study of approximately 1000 hospitalized covid patients found an 80% reduction in mortality with high-dose vitamin D.
- A large Israeli study found a strong link between vitamin D deficiency and covid-19 severity.
- For an overview of all covid-19 vitamin D studies, see here.

Aspirin

- A US study showed that aspirin has a strong antiplatelet and anticoagulant effect in covid patients, which could help prevent infection-related thrombosis, embolism and stroke.
- Another US study found a reduction in covid mortality at 30 days from 10.5% (control group) to 4.3% (with aspirin) in veterans taking aspirin.
- A retrospective US study with 400 patients found a reduction in ICU treatments by 43% and a reduction in mortality by 47% in the group of patients treated early with aspirin.
- A Mexican randomized controlled trial found a 40% reduction in hospitalization in patients receiving sulodexide (a heparin combination).
- The US FLCCC Alliance recommends aspirin for the early treatment of covid-19.

Mouthwashes and nasal sprays

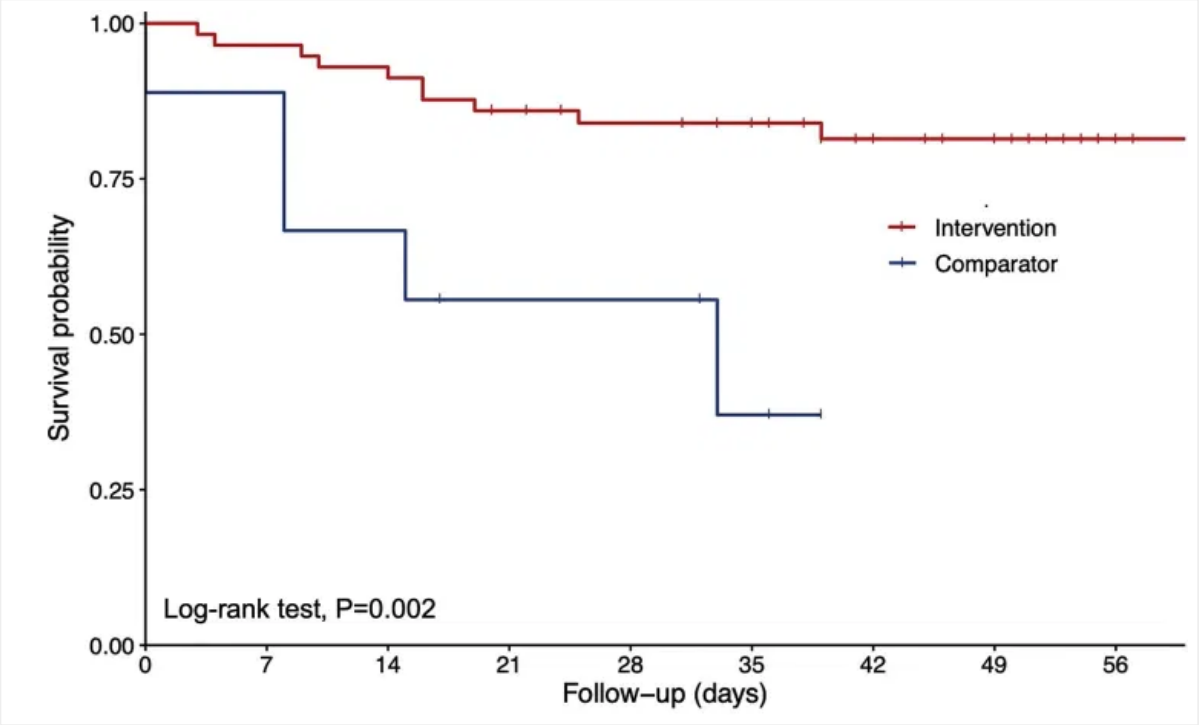
- Several small studies found that mouthwashes (gargling) based on povidone-iodine and nasal sprays based on povidone-iodine or nitric oxide may prevent a coronavirus infection or reduce its duration or symptoms (more about this).
- The German Society for Hospital Hygiene (DGKH) recommends anti-viral mouthwashes and nasal sprays for prophylaxis and early treatment.
- Some observers argued that traditional nasal rinsing and gargling practices in South East Asia may have helped successfully limiting coronavirus infections in these countries.
- Israel started mass production of nasal sprays based on nitric oxide in early 2021.

Corticosteroids

- A study by the University of Oxford, published in the Lancet, found a significant reduction in urgent care visits and hospitalizations in patients receiving budesonide (an asthma drug).
- The British PRINCIPLE trial found that budesonide accelerated recovery by 3 days and reduced hospitalizations and deaths from 10.3% to 8.5%.
- The early outpatient treatment protocol developed by McCullough et al. recommends the use of prednisone if (and only if) covid-related respiratory symptoms develop.

Hydroxychloroquine (HCQ)

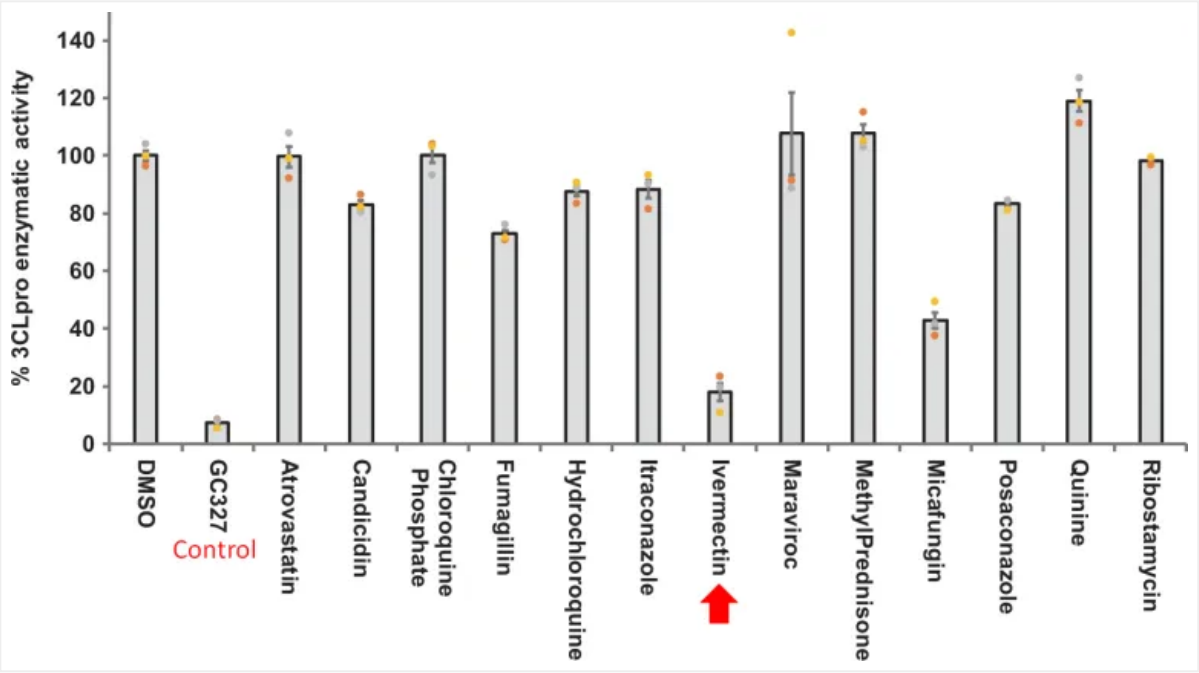
- Contrary to media claims, correctly dosed HCQ has been shown to be effective for the early treatment of covid-19, reducing hospitalizations and deaths in high-risk patients by up to 60%.
- HCQ has well-established anti-thrombotic and immunomodulatory properties, which counteract two of the most serious complications of severe covid, i.e. thromboembolisms and auto-immune hyperinflammation, if administered in the early stage of the disease.
- In contrast, direct anti-viral action of HCQ remains uncertain *in vivo*, and HCQ's role as a 'zinc ionophore' (improving the cellular absorption of zinc) appears to be irrelevant. Nevertheless, combining anti-thrombotic HCQ with anti-viral zinc has been shown to be beneficial.
- Regarding safety, a comprehensive study by the European Society of Cardiology confirmed that correctly dosed HCQ is safe for covid patients in all clinical settings.
- The alleged or actual negative results of some HCQ trials were based on delayed use (ICU) and toxic overdoses (e.g. in the Recovery and Solidarity trials), fraudulent data sets (the Surgisphere scandal), or lacking risk-stratification (as covid remains mild in most people).



Covid survival rate with high-dose vitamin D (red) vs. control (blue) in a nursing home (Annweiler)

Modes of action

- **Zinc** inhibits RNA polymerase activity of coronaviruses and thus blocks virus replication, as first discovered by world-leading SARS virologist Ralph Baric in 2010.
- **Ivermectin** (an antiparasitic drug) has strong anti-viral and anti-inflammatory properties.
- **Quercetin** (a plant polyphenol) supports the cellular absorption of zinc and has additional anti-viral properties, as first discovered during the SARS-1 epidemic in 2003.
- **Bromhexine** (a mucolytic cough medication) inhibits the expression of cellular TMPRSS2 protease and thus the entry of the virus into the cell, as first described in 2017.
- **Vitamin D3** supports and improves the immune system response to infections.
- **Aspirin** may help prevent infection-related thrombosis and embolisms in patients at risk.
- **HCQ** has known anti-thrombotic, anti-inflammatory and possibly anti-viral properties.
- **Azithromycin** (an antibiotic) prevents bacterial superinfections of the lung.
- **Corticosteroids** (prednisone, budesonide) reduce covid-related systemic inflammation.



Ivermectin inhibiting the main SARS-CoV-2 replication enzyme 3CLpro (Mody et al, edited)

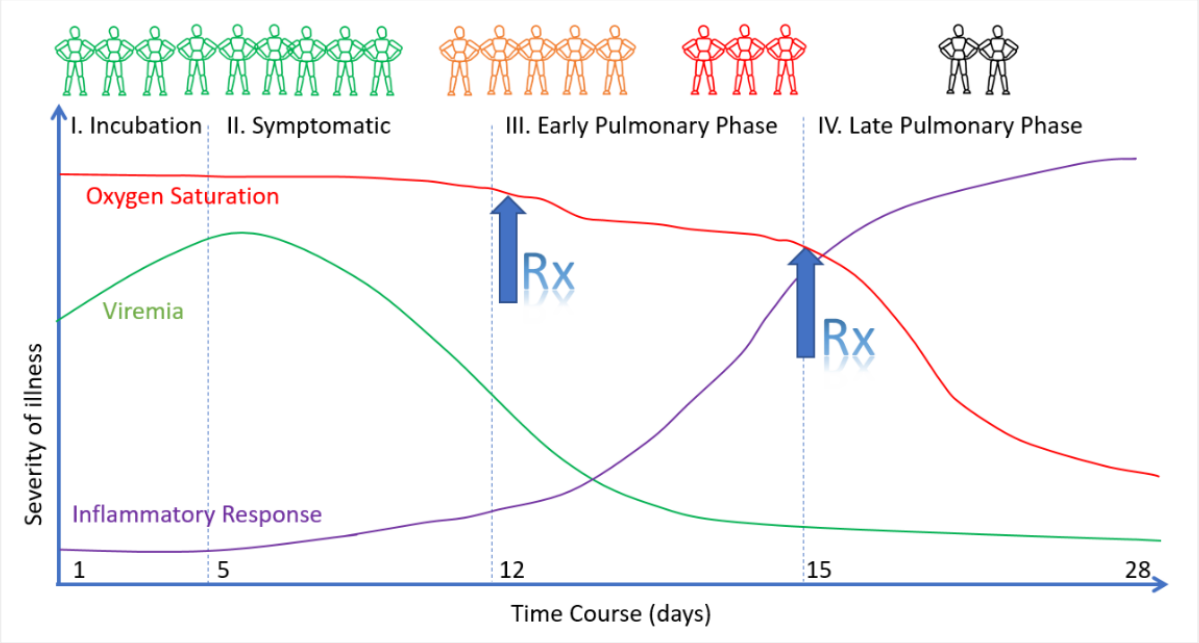
Additional notes

The **early treatment** of patients as soon as the first typical symptoms appear and even without a PCR test is essential to prevent progression of the disease. In contrast, isolating infected high-risk patients at home and without early treatment until they develop serious respiratory problems, as often happened during lockdowns, may be counterproductive.

People at high risk living in an epidemically active area should consider **prophylactic treatment** together with their doctor. The reason for this is the long incubation period of covid-19 (up to 14 days): when patients first notice that they contracted the disease, the viral load is already at a maximum and there are often only a few days left to react with an early treatment intervention.

Early treatment based on the above protocol is intended to **avoid hospitalization**. If hospitalization nevertheless becomes necessary, experienced ICU doctors recommend avoiding invasive ventilation (intubation) whenever possible and using oxygen therapy (HFNC) instead.

It is conceivable that the above treatment protocol, which is simple, safe and inexpensive, could render more complex medications, vaccinations, and other measures largely obsolete.



Stages of covid disease (EVMS)

References

Ivermectin

1. **Overview**: A summary of international ivermectin covid studies (c19ivermectin.com)
2. **Review**: Ivermectin – A Potential Global Solution to the Covid-19 Pandemic (FLCCC)
3. **Review**: Meta-analysis of randomized trials of ivermectin to treat SARS-CoV-2 infection (Andrew Hill et al., Research Square, January 2021)

Zinc

1. **Study**: Low zinc levels at clinical admission associates with poor outcomes in COVID-19 (Vogel et al., medRxiv, October 2020)
2. **Study**: Hydroxychloroquine and azithromycin plus zinc vs hydroxychloroquine and azithromycin alone: outcomes in hospitalized COVID-19 patients (Carlucci et al., MedRxiv, May 2020)
3. **Study**: Treatment of SARS-CoV-2 with high dose oral zinc salts: A report on four patients (Eric Finzi, International Journal of Infectious Diseases, June 2020)
4. **Study**: Zinc Inhibits Coronavirus and Arterivirus RNA Polymerase Activity *In Vitro* and Zinc Ionophores Block the Replication of These Viruses in Cell Culture (Velthuis et al, PLOS Path, 2010)
5. **Study**: Effect of Zinc Salts on Respiratory Syncytial Virus Replication (Suara & Crowe, AAC, 2004)
6. **Study**: Zinc for the common cold (Cochrane Systematic Review, 2013)
7. **Review**: Zinc supplementation to improve treatment outcomes among children diagnosed with respiratory infections (WHO, Technical Report, 2011)
8. **Article**: Can Zinc Lozenges Help with Coronavirus Infections? (McGill University, March 2020)

Quercetin

1. **Study**: Small molecules blocking the entry of severe acute respiratory syndrome coronavirus into host cells (Ling Yi et al., Journal of Virology, 2004)
2. **Study**: Zinc Ionophore Activity of Quercetin and Epigallocatechin-gallate: From Hepa 1-6 Cells to a Liposome Model (Dabbagh et al., JAFC, 2014)
3. **Study**: Quercetin as an Antiviral Agent Inhibits Influenza A Virus Entry (Wu et al, Viruses, 2016)

4. **Study**: Quercetin and Vitamin C: An Experimental, Synergistic Therapy for the Prevention and Treatment of SARS-CoV-2 Related Disease (Biancatelli et al, Front. in Immun., June 2020)
5. **Report**: EVMS Critical Care Covid-19 Management Protocol (Paul Marik, MD, June 2020)

Bromhexine

1. **Study**: TMPRSS2: A potential target for treatment of influenza virus and coronavirus infections (Wen Shen et al., Biochimie Journal, 2017)
2. **Letter**: Repurposing the mucolytic cough suppressant and TMPRSS2 protease inhibitor bromhexine for the prevention and management of SARS-CoV-2 infection (Maggio and Corsini, Pharmacological Research, April 2020)
3. **Study**: Potential new treatment strategies for COVID-19: is there a role for bromhexine as add-on therapy? (Depfenhart et al., Internal and Emergency Medicine, May 2020)
4. **Study**: Bromhexine Hydrochloride: Potential Approach to Prevent or Treat Early Stage COVID-19 (Stepanov and Lierz, Journal of Infectious Diseases and Epidemiology, June 2020)
5. **Study**: TMPRSS2 inhibitors, Bromhexine, Aprotinin, Camostat and Nafamostat as potential treatments for COVID-19 (Arsalan Azimi, Drug Target Review, June 2020)
6. **Trial**: Effect of bromhexine on clinical outcomes and mortality in COVID-19 patients: A randomized clinical trial (Ansarin et al., BioImpacts, July 2020)

Aspirin and heparin

1. **Study**: Anticoagulant Treatment Is Associated With Decreased Mortality in Severe Coronavirus Disease 2019 Patients With Coagulopathy (Tang et al, JTH, May 2020)
2. **Study**: Autopsy Findings and Venous Thromboembolism in Patients With COVID-19 (Wichmann et al., Annals of Internal Medicine, May 2020)
3. **Review**: Anticoagulation Guidance Emerging for Severe COVID-19 (Medpage Today)
4. **Study**: Platelet gene expression and function in patients with COVID-19 (Manne et al., ASH Blood, September 2020)
5. **Review**: Should aspirin be used for prophylaxis of COVID-19-induced coagulopathy? (Hussein et al., Medical Hypotheses, November 2020)

See also

- Facts about Covid-19
- On the effectiveness of face masks
- Studies on the lethality of Covid-19

Share on: Twitter / Facebook

SWISS POLICY RESEARCH

» Kontakt
» Übersicht
» Donationen
» Disclaimer

ENGLISH

» About Us / Contact
» Facts about Covid-19
» The Media Navigator
» Donations to SPR

FOLLOW BY EMAIL

UP ↑