

# IVERMECTIN VS MOLNUPIRAVIR

## A comparison

Phillip Altman BPharm (Hons), MSc, PhD – 28 October 2021

Proposed use	Ivermectin	Molnupiravir
<b>History</b>	Safely used for more than 30 years (4 billion doses) for various parasitic infections, included in the WHO List of Essential Drugs. Discoverers won the Nobel Prize for Medicine in 2015.	Initially researched >20 years ago but abandoned due to potential mutagenic properties (pharmaceutical company Pharmasset). Later transformed into a pro-drug for Covid-19.
<b>Mechanism of action</b>	Antiviral properties against a number of RNA viruses. Possible mechanisms include: interferes with the entrance and replication of SARS-CoV-2 into human cells, competitive binding of ivermectin with the host receptor-binding region of SARS-CoV-2 spike protein, interference with viral replication by a number of possible mechanisms.	Wide spectrum antiviral. Inhibits viral propagation through lethal mutagenesis by introducing errors in the viral genome (1, 2)
<b>Proposed use for COVID-19</b>	Prevention and treatment in all phases of COVID-19 in both vaccinated and unvaccinated populations.	Claimed to be the first oral antiviral medication for treatment of COVID-19
<b>Approved use</b>	Various parasitic infections and scabies for human use worldwide	Not approved yet
<b>Clinical trial data</b>	<p>31 observational controlled trials including 6,800 patients, 27 randomised controlled trials including over 3,400 patients, multiple meta-analyses confirming statistically significant benefit regarding time to viral clearance, time to recovery, rate of hospitalisation and reduction in mortality.</p> <p>Borody &amp; Clancy (4) triple therapy (ivermectin, doxycycline, zinc) treatment of 600 pre-hospital PCR positive COVID-19 individuals (control data):</p> <p>90% reduction in hospital admissions No deaths No withdrawals due to side effects All subjects had normal oximetry following treatment program</p>	<p>Clinical efficacy based on a single clinical trial.</p> <p>“At the interim analysis, molnupiravir reduced the risk of hospitalization or death by approximately 50%; 7.3% of patients who received molnupiravir were either hospitalized or died through Day 29 following randomization (28/385), compared with 14.1% of placebo-treated patients (53/377); p=0.0012. Through Day 29, no deaths were reported in patients who received molnupiravir, as compared to 8 deaths in patients who received placebo. At the recommendation of an independent Data Monitoring Committee and in consultation with the U.S. Food and Drug Administration (FDA), recruitment into the study is being stopped early due to these positive results.” (3)</p>
<b>International status</b>	<p>Used widely and successfully in countries such as India, Mexico, Peru and Argentina in national COVID-19 treatment programs.</p> <p>Ivermectin is banned from use in COVID-19 in Australia by the TGA.</p>	Merck is seeking Provisional Approval in Australia and Emergency Use Authorisation in the US based on a single partially completed clinical trial and no long-term safety data.

# IVERMECTIN VS MOLNUPIRAVIR

## A comparison

Phillip Altman BPharm (Hons), MSc, PhD – 28 October 2021

Proposed use	Ivermectin	Molnupiravir
<b>Safety</b>	<p>Ivermectin is a drug with an established wide margin of safety (5) and safer than many non-prescription medications such as paracetamol. Serious adverse effects appear very rare.</p> <p>The US National Institute of Health (NIH) considers ivermectin to be “generally well tolerated” (6).</p>	<p>Unknown long-term safety and potential mutagenicity (cancer causing).</p>
<b>Cost</b>	<p>Minimum cost</p>	<p>Australian government has pre-purchased 300,000 courses of molnupiravir – estimated cost \$700 per course. Estimate \$A300m.</p>
<b>Availability</b>	<p>Now Generic availability</p>	<p>Early 2022 Patented</p>

## References

1. Brandon Malone and Elizabeth A. Campbell  
Molnupiravir: coding for catastrophe  
Laboratory of Molecular Biophysics, The Rockefeller University, New York, NY, USA.  
Published online: 13 September 2021 <https://doi.org/10.1038/s41594-021-00657-8>
2. Shuntai Zhou et al  
 $\beta$ -d-N -hydroxycytidine Inhibits SARS- CoV-2 Through Lethal Mutagenesis But Is Also Mutagenic To Mammalian Cells  
The Journal of Infectious Diseases® 2021;224:415–9
3. Merck News Release 1 Oct. 2021  
Merck and Ridgeback’s Investigational Oral Antiviral Molnupiravir Reduced the Risk of Hospitalization or Death by Approximately 50 Percent Compared to Placebo for Patients with Mild or Moderate COVID-19 in Positive Interim Analysis of Phase 3 Study
4. Borody, TJ, Clancy, RL. Combination Therapy for COVID-19 Based on Ivermectin in an Australian Population. TrialSiteNews – 19 Oct. 2021. This is pre-publication data.  
<https://trialsitenews.com/combination-therapy-for-covid-19-based-on-ivermectin-in-an-australian-population/>
5. The TGA Australian Public Assessment Report for Ivermectin (October 2013)
6. US National Institute of Health Covid-19 Treatment Guidelines ([covid19treatmentguidelines.nih.gov](https://www.covid19treatmentguidelines.nih.gov) Table 2e: Characteristics of Antiviral Agents That Are Approved or Under Evaluation for the Treatment of COVID-19”.  
<https://www.covid19treatmentguidelines.nih.gov/tables/table-2e/>