What COVID-19 vaccines and medications are available around the world?

Since the initial reports of pneumonia cases with no identifiable origin in December 2019 in Wuhan, China, COVID-19 has spread around the world. Nearly two years on from the start of the pandemic, however, various COVID-19 vaccines and treatments have been developed and approved for use in record time.

In March 2020, the World Health Organization (WHO) declared COVID-19 a pandemic. On 16th March, however, the first phase of a clinical trial of a COVID-19 vaccine between the National Institutes of Health and Moderna began. Here's a look at the vaccines and treatments developed so far in the ongoing fight against coronavirus.

Which COVID-19 vaccines have been approved for use?

Moderna vaccine

In July 2020, Moderna began phase three clinical trials of the COVID-19 vaccine. In November, Moderna officials reported that their vaccine had achieved an effective rate of 94% in protecting against COVID-19 infection and it was announced the COVID-19 vaccine would be widely available in spring 2021.

In December, the US Food and Drug Administration authorised the Moderna vaccine for emergency use in individuals aged 18 and over. In the UK, the COVID-19 jab became the third vaccine approved for use. In May 2021, company officials announced their vaccine was effective in clinical trials against COVID-19 in children aged 12 to 17 years.

In September 2021, Moderna announced it was developing a combination booster shot for both COVID-19 and flu.

Pfizer-BioNTech vaccine

The pharmaceutical firm Pfizer joined forces with German biotech company BioNTech and Chinese drugmaker Fosun Pharma to develop a two-dose mRNA vaccine when the pandemic started.

In August 2020, company officials said the COVID-19 vaccine had produced a good response in phase one and two clinical trials. In November, the company announced that its vaccine had been more than 90% effective in preventing COVID-19 infection in clinical trial participants. The UK and the USA approved the Pfizer-BioNTech vaccine in December.

In February, a UK study reported that a single dose of the Pfizer vaccine could reduce the risk of contracting COVID-19 by 70% with an 85% reduction after two doses. In October, the company announced the vaccine was safe and effective for children aged between five and 11 years.

AstraZeneca - University of Oxford

In April 2020, the pharmaceutical company AstraZeneca began a phase one clinical trial at the University of Oxford and follow-up trials were carried out throughout the year. The COVID-19 jab was approved for use in the UK in December.

In February 2021, AstraZeneca announced that phase three clinical trial results showed that their COVID-19 vaccine was 82% effective against contracting COVID-19 after 12 weeks. In the same month, the WHO approved the distribution of the AstraZeneca vaccine for emergency use worldwide.

Johnson & Johnson

In July 2020, Johnson & Johnson launched human trials for its single-dose COVID-19 vaccine after releasing details of a study in monkeys that showed the COVID-19 jab offered strong protection. In mid-November, company officials said they expected their vaccine to be ready for approval in the USA by February.

At the start of 2021, the firm announced that the vaccine was 66% effective overall against symptomatic infection, but provided greater protection against severe illness. The Johnson & Johnson vaccine was approved for use in the USA in February 2021 and in the UK in May 2021.

Sputnik V

Officially known as Gam-COVID-Vac, Sputnik V is a COVID-19 vaccine created by the Gamaleya National Center of Epidemiology and Microbiology in Russia. The vaccine was authorised for use by the Russian Ministry of Health in August 2020, more than a month before phase one and two trial results were published and before the phase three trial had begun.

It was the first COVID-19 vaccine approved for use in any nation and has since been authorised for use in around 69 countries worldwide. However, it is not yet approved for use in the UK or the USA. In October 2021, the WHO said the Sputnik V vaccine had not yet been approved for emergency use because of missing data and legal procedures. Earlier this year, phase one trials for a single-dose vaccine called Sputnik Light began.

Sinovac and Sinopharm

The Chinese biopharmaceutical company Sinovac is behind the CoronaVac vaccine. In April 2020, phase one trials in adults began. In late August 2020, China approved CoronaVac for emergency use to vaccinate high-risk groups such as medical staff. In February 2021, China approved CoronaVac for general use in adults and later in children. The WHO validated the Sinovac-CoronaVac jab for emergency use in June.

In April 2020, clinical trials for the Sinopharm vaccine, produced by a Chinese state-owned company, were approved. It was validated for use in adults in China in December 2020 and in children in the summer of 2021.

Delta variant effectiveness

One of the biggest concerns for scientists has been that the COVID-19 vaccines would be less effective if the virus mutated signficantly. All of them were developed against the original variant of coronavirus. Since then we have had the Alpha and Beta variants and now the Delta variant, which is almost the universal cause of infection in the UK.

Reassuringly, research suggests that while vaccines offer less protection against infection with the Delta variant than with other COVID-19 strains, both the AstraZeneca and the Pfizer vaccine continue to provide excellent protection against severe illness, with reductions in hospitalisation of 92% and 96% respectively after two doses.

The level of protection provided by COVID-19 vaccines against the newly emerged Omicron variant is being investigated as a matter of urgency. It should only take a few weeks to get an idea of whether people who have been vaccinated produce reasonable levels of 'neutralising antibodies' - in other words, that the antibodies they produce are capable of protecting against severe infection.

Which drugs are being used to treat COVID-19?

Various medications are being used to treat COVID-19.

Dexamethasone

Dexamethasone, a steroid, is a medicine used to treat a wide range of health conditions, from severe skin conditions to croup and autoimmune conditions. However, it is being used in hospitals as a treatment for severe cases of COVID-19.

A UK study published in 2020 found dexamethasone reduced death by up to a third in hospitalised patients with severe respiratory complications as a result of COVID-19 infection. Earlier this year, figures published by NHS England showed that use of the drug had saved 22,000 lives in the UK and an estimated one million worldwide.

Molnupiravir

Molnupiravir, developed by the US drug companies Merck, Sharp & Dohme and Ridgeback Biotherapeutics, is an antiviral medication used to treat people infected with COVID-19. The drug was approved for medical use in the UK in November 2021 after a study showed it reduced the risk of hospitalisation or death by about half among people at risk of severe illness.

On 26th November, the company downgraded its estimate of its effectiveness against hospitalisation or death to 30% after full results of the study became available. Nonetheless, it still prevented one person from being hospitalised or dying for every 33 people treated.

The tablet will be given twice a day to patients recently diagnosed with the disease who have at least one risk factor, such as heart disease, obesity or being over the age of 60. In clinical trials the pill, originally developed to treat flu, halved the risk of hospitalisation or death.

Paxlovid

In November 2021, Pfizer reported that its antiviral drug reduced the risk of hospitalisation and death from COVID-19 by 89%. In the company's study, the drug was given to vulnerable participants who were unvaccinated and experiencing mild to moderate symptoms of the disease. Pfizer is now seeking approval to distribute the medication in the USA.

What are monoclonal antibodies?

Monoclonal antibodies trigger the immune system to attack a virus. They are man-made proteins that act like human antibodies in the immune system.

Ronapreve

In August 2021, the UK's drug regulator approved the first monoclonal antibody treatment - Ronapreve, a combination of the two drugs casirivimab and imdevimab - for the treatment and prevention of acute COVID-19 in adults.

The COVID-19 drug is administered by injection or drip infusion and is approved for medical use in Japan, the UK, the EU and Australia. One trial found one-off treatment with Ronapreve in COVID-19 patients with at least one risk factor reduced the outcome of death by around 70%.

The UK's Recovery trial tested Ronapreve across 9,785 patients hospitalised with COVID-19, with some receiving standard care and some standard care as well as the drug. Among patients who hadn't mounted their own antibody response to the virus, the drug cut deaths by a fifth.

Regkirona

Regdanvimab, sold under the name Regkirona, is a human monoclonal antibody used for the treatment of COVID-19. Regdanvimab was approved for medical use in the EU in November 2021.

Authored by:	Peer Reviewed by: Dr Sarah Jarvis MBE, FRCGP	
Originally Published: 20/11/2023	Next review date: 02/12/2021	Document ID: doc_31752

View this article online at: patient.info/news-and-features/covid-19-timeline-what-coronavirus-vaccines-and-medications-are-available-around-the-world

Discuss What COVID-19 vaccines and medications are available around the world? and find more trusted resources at Patient.