Advances in COVID-19 Management

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This activity is jointly provided by Physicians’ Research Network and the Medical Society of the State of New York.
Conflict of Interest: JKR

• Honoraria for lectures and/or consultancies from Abivax, Galapagos, Gilead, Janssen, Merck, NPO Petrovax Pharm LLC, Theratechnologies and ViiV.

• Research grants from Dt. Leberstiftung, DZIF, Hectorstiftung, NEAT ID.
» Epidemiology
COVID-19 Pandemic: announced from WHO 11th March 2020 (118,000 confirmed infections in 114 countries)

Globally, as of 6:17pm CEST, 29 July 2021, there have been 195,886,929 confirmed cases of COVID-19, including 4,189,148 deaths, reported to WHO.
WHO Dashboard

- Americas: 76,584,467 confirmed
- Europe: 59,638,715 confirmed
- South-East Asia: 38,018,705 confirmed
- Eastern Mediterranean: 12,401,911 confirmed
- Africa: 4,868,312 confirmed
- Western Pacific: 4,374,055 confirmed

Source: World Health Organization

Data may be incomplete for the current day or week.
### Worldometer

<table>
<thead>
<tr>
<th>Country</th>
<th>Cases</th>
<th>Deaths</th>
<th>Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>35,586,564</td>
<td>628,503</td>
<td>North America</td>
</tr>
<tr>
<td>India</td>
<td>31,572,344</td>
<td>423,244</td>
<td>Asia</td>
</tr>
<tr>
<td>Brazil</td>
<td>19,839,369</td>
<td>554,626</td>
<td>South America</td>
</tr>
<tr>
<td>Russia</td>
<td>6,242,066</td>
<td>157,771</td>
<td>Europe</td>
</tr>
<tr>
<td>France</td>
<td>6,079,239</td>
<td>111,764</td>
<td>Europe</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>5,801,561</td>
<td>129,515</td>
<td>Europe</td>
</tr>
<tr>
<td>Turkey</td>
<td>5,682,630</td>
<td>51,184</td>
<td>Asia</td>
</tr>
<tr>
<td>Argentina</td>
<td>4,905,925</td>
<td>105,113</td>
<td>South America</td>
</tr>
</tbody>
</table>

**Neue Fälle pro Tag in North Rhine-Westphalia**

![Graph showing new cases per day in North Rhine-Westphalia](image-url)
How should we respond to the Coronavirus SARS-CoV-2 outbreak?

» Social distancing
» Face mask wearing
» Digital contact tracing (backward contact tracing up to 14 days, use of mobile phone signals)
» Serosurveillance studies
» High capability for coronavirus lab testing
» Sufficient amount of ICU beds
» Lockdown strategies
» School closing
» Vaccination
Guidance for Implementing COVID-19 Prevention Strategies in the Context of Varying Community Transmission Levels and Vaccination Coverage

- CDC recommends five critical factors be considered to inform local decision-making:
  - 1) level of SARS-CoV-2 community transmission
  - 2) health system capacity
  - 3) COVID-19 vaccination coverage
  - 4) capacity for early detection of increases in COVID-19 cases
  - 5) populations at increased risk for severe outcomes from COVID-19.
- Among strategies to prevent COVID-19, CDC recommends all unvaccinated persons wear masks in public indoor settings. Based on emerging evidence on the Delta variant (2), CDC also recommends that fully vaccinated persons wear masks in public indoor settings in areas of substantial or high transmission.

Christie A et al. MMWR 2021, July 27th
Testing
## Coronavirus Disease 2019 Testing Basics

<table>
<thead>
<tr>
<th></th>
<th><strong>MOLECULAR TEST</strong></th>
<th><strong>ANTIGEN TEST</strong></th>
<th><strong>ANTIBODY TEST</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Also known as...</strong></td>
<td>Diagnostic test, viral test, molecular test, nucleic acid amplification test (NAAT), RT-PCR test, LAMP test</td>
<td>Diagnostic test, viral test, rapid test</td>
<td>Serological test, serology, blood test, serology test</td>
</tr>
</tbody>
</table>
| **How the sample is taken...** | Nasal swabs, either shallow or deep (most tests).  
Saliva (some tests) | Nasal or nasopharyngeal swab (most tests) | Blood from a fingerstick or vein |
| **How long it takes to get results...** | Less than an hour (at-home tests and some point-of-care locations), same day (some point-of-care locations) or 1-3 days (tests sent to a lab for processing). Some tests may take longer in some locations, depending on testing capacity. | Some may be very fast (15-30 minutes), depending on the test | Same day (some point-of-care locations) or 1-3 days (tests sent to a laboratory for processing) |
| **Is another test needed...** | Not usually. This type of test is typically highly accurate and usually does not need to be repeated. Some may indicate the need to re-test in certain circumstances. | Maybe. Positive results are usually highly accurate, but false positives can happen, especially in areas where very few people have the virus. Negative results may need to be confirmed with a molecular test. | Sometimes a second antibody test is needed for accurate results. |
| **What it shows...**   | Diagnoses active COVID-19 infection. (Some tests may also diagnose influenza or other respiratory viruses) | Diagnoses active COVID-19 infection. (Some tests may also diagnose influenza or other respiratory viruses) | Shows if you’ve been infected by the virus that causes COVID-19 in the past |
| **What it can’t do...** | It cannot show if you ever had COVID-19 or were infected with the virus that causes COVID-19 in the past | It may not detect an early COVID-19 infection. Your health care provider may order a molecular test if your antigen test shows a negative result, but you have symptoms of COVID-19. It also cannot show if you ever had COVID-19 or were | It cannot diagnose COVID-19 at the time of the test or show that you do not have COVID-19 |

[www.fda.gov](http://www.fda.gov) (April 2021)
Frequent testing of large population groups combined with contact tracing and isolation measures will be crucial for containing Coronavirus Disease 2019 outbreaks. Here we present LAMP-Seq, a modified, highly scalable reverse transcription loop-mediated isothermal amplification (RT–LAMP) method. Unpurified biosamples are barcoded and amplified in a single heat step, and pooled products are analyzed en masse by sequencing. Using commercial reagents, LAMP-Seq has a limit of detection of ~2.2 molecules per µl at 95% confidence and near-perfect specificity for severe acute respiratory syndrome coronavirus 2 given its sequence readout.

Clinical validation of an open-source protocol with 676 swab samples, 98 of which were deemed positive by standard RT–qPCR, demonstrated 100% sensitivity in individuals with cycle threshold values of up to 33 and a specificity of 99.7%, at a very low material cost.

With a time-to-result of fewer than 24 h, low cost and little new infrastructure requirement, LAMP-Seq can be readily deployed for frequent testing as part of an integrated public health surveillance program.
Clinical presentation
Watch for symptoms

People with COVID-19 have had a wide range of symptoms reported – ranging from mild symptoms to severe illness. Symptoms may appear 2-14 days after exposure to the virus. Anyone can have mild to severe symptoms. People with these symptoms may have COVID-19:

- Fever or chills
- Cough
- Shortness of breath or difficulty breathing
- Fatigue
- Muscle or body aches
- Headache
- New loss of taste or smell
- Sore throat
- Congestion or runny nose
- Nausea or vomiting
- Diarrhea

Research scholars caution that the UK's most broadly acknowledged variant may be mistaken for milder illness
• Coronavirus - latest updates
• See all our coronavirus coverage

*Data suggests the Delta variant is at least 40% more transmissible than the Alpha variant first detected in Kent.*

Headaches, a sore throat, and a runny nose are the most common symptoms associated with the UK's most widely established Covid variant, researchers have said.

The data, collected as part of the app-based Zoe Covid symptom study, suggests that the Delta variant first detected in India feels like a "bad cold", according to Tim Spector, a professor of genetic epidemiology at King's College London, who is leading the work.

"Covid is ... acting differently now, it's more like a bad cold," he said. "People might think they've just got some sort of seasonal cold, and they still go out to parties ... we think this is fuelling a lot of the problem. So, what's really important to realise is that since the start of May, we've been looking at the top symptoms in all the app users, and they're not the same as they were. So, the number one symptom is headache ... followed by sore throat, runny nose and fever."

- All of our contributors to the app are invited to request a PCR test via the NHS portal as soon as they report any new symptoms.
- The researchers modelled the early signs of COVID-19 infection and successfully detected 80% of cases when trained on the first three days of self-reported symptoms.
What is long COVID?

Long COVID symptoms include fatigue, breathlessness and 'brain fog'.  Image: Unsplash/ Bermix Studio
What is Long-COVID?

- Long COVID symptoms include fatigue, breathlessness and ‘brain fog’.
- A recent study suggests that more than two million adults in England - around 3.5% of the population - may have had long COVID.¹
- Women, people who smoked, were overweight or obese, lived in deprived areas, or had been admitted to hospital, all had a higher risk of persistent symptoms, while Asian people had a lower risk.
- Increasing age was also linked with having persistent symptoms, with the risk rising by 3.5% with each decade of life.
- COVID vaccination might help reduce long-term symptoms.

Whitaker M et al. In press
» Treatment considerations
Two main processes are thought to drive the pathogenesis of COVID-19. Early in the course of the infection, the disease is primarily driven by replication of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Later in the course of infection, the disease is driven by an exaggerated immune/inflammatory response to the virus that leads to tissue damage.

Based on this understanding, it is anticipated that antiviral therapies would have the greatest effect early in the course of disease, while immunosuppressive/anti-inflammatory therapies are likely to be more beneficial in the later stages of COVID-19.
## Therapeutic management of non-hospitalized COVID-19 patients

<table>
<thead>
<tr>
<th>PATIENT DISPOSITION</th>
<th>PANEL'S RECOMMENDATIONS</th>
</tr>
</thead>
</table>
| Not Requiring Hospitalization or Supplemental Oxygen, As Determined by a Health Care Provider in ED or an In-Person or Telehealth Visit | Anti-SARS-CoV-2 monoclonal antibody products are recommended for outpatients with mild to moderate COVID-19 who are at high risk of disease progression, as defined by the EUA criteria (treatments are listed in alphabetical order):[^a]  
- Casirivimab plus imdevimab; or  
- Sotrovimab  
At this time, the Panel recommends against the use of bamlanivimab plus etesevimab in these patients due to an increase in the proportion of potentially resistant variants (AIII).[^b] See text for details.  
The Panel recommends against the use of dexamethasone or other systemic glucocorticoids in the absence of another indication (AIII).[^c] |
| Discharged From Hospital Inpatient Setting in Stable Condition and Does Not Require Supplemental Oxygen | The Panel recommends against continuing the use of remdesivir (Ala), dexamethasone (Ala), or baricitinib (Ala) after hospital discharge. |
| Discharged From Hospital Inpatient Setting and Requires Supplemental Oxygen  
For those who are stable enough for discharge but who still require oxygen[^d] | There is insufficient evidence to recommend either for or against the continued use of remdesivir, dexamethasone, and/or baricitinib. Review the text below when considering the use of any of these agents after hospital discharge. |
| Discharged From ED Despite New or Increasing Need for Supplemental Oxygen  
When hospital resources are limited, inpatient admission is not possible, and close follow-up is ensured[^e] | The Panel recommends using **dexamethasone** 6 mg PO once daily for the duration of supplemental oxygen (dexamethasone use should not exceed 10 days) with careful monitoring for adverse events (BIII).  
There is insufficient evidence to recommend either for or against the use of remdesivir. When considering the use of remdesivir, review the text below for further discussion.  
The Panel recommends against the use of **baricitinib** in this setting, except in a clinical trial (AIII). |

[^a]: Rating of Recommendations: A = Strong; B = Moderate; C = Optional  
[^b]: Rating of Evidence: I = One or more randomized trials without major limitations; IIa = Other randomized trials or subgroup analysis of randomized trials; IIb = Nonrandomized trials or observational cohort studies; III = Expert opinion
REGEN-COV™ (casirivimab with imdevimab) Reduced Risk of Hospitalization or Death by 70% in Non-hospitalized COVID-19 Patients

• A phase 3, randomized, double-blind, placebo-controlled trial assessed the efficacy and safety of REGEN-COV in 4,567 adults (mean age, 48.5 years; 49% men) with confirmed COVID-19 infection but who were not hospitalized. All patients had at least one risk factor for severe COVID-19, including chronic lung disease, asthma, obesity, cardiovascular disease and older age.

• The trial evaluated two REGEN-COV doses: 2,400 mg and 1,200 mg.
• Patients assigned REGEN-COV 2,400 mg had a 71% reduction in the risk for COVID-19-related hospitalization or all-cause death at day 29 compared with placebo (P < .0001) and those assigned the 1,200 mg dose had a 70% reduction in the primary endpoint compared with placebo (P < .0024).
• Both doses of REGEN-COV were associated with a shorter mean time to COVID-19 symptom resolution compared with placebo (10 days vs. 14 days).

• REGEN-COV at both doses reduced viral load by 0.71 log10 copies/mL and 0.86 log10 copies/mL at 7 days compared with placebo (P < .0001 for both).
High-Risk Criteria in the Emergency Use Authorizations for Anti-SARS-CoV-2 Monoclonal Antibodies

» The FDA EUAs for all available anti-SARS-CoV-2 monoclonal antibodies and combinations have the same criteria for use: nonhospitalized adults and children aged ≥12 years and weighing ≥40 kg who are at high risk for progressing to severe COVID-19 and/or hospitalization.

» High-risk individuals as specified in the EUA are those who meet at least one of the following criteria:

• Body mass index (BMI) ≥35
• Chronic kidney disease
• Diabetes mellitus
• Immunocompromising condition
• Currently receiving immunosuppressive treatment
• Aged ≥65 years
• Aged ≥55 years and have:
  • Cardiovascular disease, or
  • Hypertension, or
  • Chronic obstructive pulmonary disease or another chronic respiratory disease.
The Medical Letter

Because the source matters.

An EUA for Sotrovimab for Treatment of COVID-19

June 28, 2021

Download PDF: US English

Revised 7/3/2021: The Availability paragraph has been revised.

MECHANISM OF ACTION — Sotrovimab binds to a preserved epitope on the spike protein of SARS-CoV-2. Its exact mechanism of action is unknown, but it appears to prevent membrane fusion after the virus binds to the human ACE2 receptor.

CLINICAL STUDIES — Issuance of the EUA was based on interim results from an unpublished double-blind trial (COMET-ICE, summarized in the FDA Fact Sheet) in 583 adult outpatients with mild to moderate COVID-19 who were ≥55 years old or had at least one comorbidity (diabetes, obesity, chronic kidney disease, heart failure, COPD, or moderate to severe asthma). Patients were randomized to receive a single IV infusion of sotrovimab 500 mg or placebo. The primary endpoint, progression of COVID-19 (hospitalization for >24 hours or death) by day 29, occurred in 1% of patients who received sotrovimab and in 7% of those who received placebo (HR 0.14 [95% CI 0.04-0.56], NNT 16.2). *

No studies directly comparing sotrovimab with casirivimab and imdevimab or bamlanivimab and etesevimab are available.

VARIANTS — The World Health Organization has renamed COVID-19 variants using the Greek alphabet to avoid confusion and stigmatization. Sotrovimab appears to retain activity against the B.1.1.7 (Alpha; UK), B.1.351 (Beta; South Africa), P.1 (Gamma; Brazil), B.1.427/B.1.429 (Epsilon; California), B.1.526 (Iota, New York), and B.1.617 (Delta; India) variants of SARS-CoV-2. Casirivimab and imdevimab also appear to retain activity against prominent variants, but data on their effectiveness against the B.1.617 strain are lacking. Bamlanivimab and etesevimab are unlikely to have activity against the B.1.351 and P.1 variants; their distribution to states in which these variants cause >10% of COVID-19 cases has paused. 7

Treatment-emergent epitope variants were detected in 8 patients who received sotrovimab in COMET-ICE; some of these substitutions conferred reduced susceptibility to the drug. 8

ADVERSE EFFECTS — The most common adverse effects of sotrovimab in COMET-ICE were rash (2%) and diarrhea (1%). Hypersensitivity reactions, including anaphylaxis, have occurred rarely with use of monoclonal antibodies, including sotrovimab, for treatment of COVID-19.

DOSEAGE AND ADMINISTRATION — Sotrovimab is supplied in 500 mg/8 mL vials, which require refrigeration during storage. The authorized dosage is 500 mg administered as a 30-minute IV infusion.
FDA authorizes REGEN-COV monoclonal antibody therapy for post-exposure prophylaxis (prevention) for COVID-19

Prophylaxis with REGEN-COV is not a substitute for vaccination against COVID-19

The U.S. Food and Drug Administration today revised the emergency use authorization (EUA) for REGEN-COV (casirivimab and imdevimab, administered together) authorizing REGEN-COV for emergency use as post-exposure prophylaxis (prevention) for COVID-19 in adults and pediatric individuals (12 years of age and older weighing at least 40 kg) who are at high risk for progression to severe COVID-19, including hospitalization or death. REGEN-COV is not authorized for pre-exposure prophylaxis to prevent COVID-19 before being exposed to the SARS-CoV-2 virus -- only after exposure to the virus.

REGEN-COV also remains authorized for the treatment of mild-to-moderate COVID-19 in adults and pediatric patients (12 years of age and older weighing at least 40 kg) with positive results of direct SARS-CoV-2 viral testing, and who are at high risk for progression to severe COVID-19, including hospitalization or death.

Prophylaxis with REGEN-COV is not a substitute for vaccination against COVID-19. FDA has authorized three vaccines to prevent COVID-19 and serious clinical outcomes caused by COVID-19, including hospitalization and death. FDA urges you to get vaccinated, if you are eligible. Learn more about FDA authorized COVID-19 vaccines.
Therapeutic management of hospitalized adults with COVID-19 based on disease severity

<table>
<thead>
<tr>
<th>DISEASE SEVERITY</th>
<th>PANEL’S RECOMMENDATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospitalized but Does Not Require Supplemental Oxygen</td>
<td>The Panel recommends against the use of dexamethasone (AIIa) or other corticosteroids (AIII). There is insufficient evidence to recommend either for or against the routine use of remdesivir. For patients who are at high risk of disease progression, the use of remdesivir may be appropriate.</td>
</tr>
</tbody>
</table>
| Hospitalized and Requires Supplemental Oxygen | Use one of the following options:  
- **Remdesivir** (e.g., for patients who require minimal supplemental oxygen) (BIIa)  
- Dexamethasone** plus remdesivir** (e.g., for patients who require increasing amounts of supplemental oxygen) (BIII)  
- Dexamethasone** (when combination therapy with remdesivir cannot be used or is not available) (BII) |
| Hospitalized and Requires Oxygen Delivery Through a High-Flow Device or Noninvasive Ventilation | Use one of the following options:  
- Dexamethasone** (AII)  
- Dexamethasone** plus remdesivir** (BIII)  
For patients who were recently hospitalized with rapidly increasing oxygen needs and systemic inflammation:  
- Add either baricitinib** (BIIa) or tocilizumab** (BIIa) to one of the two options above |
| Hospitalized and Requires IMV or ECMO | For most patients:  
- Dexamethasone** (AII)  
For patients who are within 24 hours of admission to the ICU:  
- Dexamethasone** plus tocilizumab** (BIIa) |

**Rating of recommendations:** A – Strong; B – Moderate; C = Optional  
**Rating of Evidence:** I=One or more randomized trials without major limitations; IIa=Other randomized trials or subgroup analyses of randomized trials, IIb=Nonrandomized trials or observational cohort studies, III=Expert opinion
Remdesivir

- Remdesivir is currently the only drug that is approved by the FDA and EMEA for the treatment of COVID-19.
- It is recommended for use in hospitalized patients who require supplemental oxygen.
- However, it is not routinely recommended for patients who require mechanical ventilation due to the lack of data showing benefit at this advanced stage of the disease\(^1\)-\(^4\).

Lower mortality under remdesivir treatment compared to control group in “complicated course” of disease

Appel K et al. 15. Kongress für Infektionskrankheiten und Tropenmedizin 2021. Poster a-359 (P-149).
Dexamethasone in Hospitalized Patients with Covid-19

In this controlled, open-label trial patients who were hospitalized with Covid-19, were randomly assigned to receive oral or intravenous dexamethasone (at a dose of 6 mg once daily) for up to 10 days or to receive usual care alone.

A total of 2104 patients were assigned to receive dexamethasone and 4321 to receive usual care.

Overall, 482 patients (22.9%) in the dexamethasone group and 1110 patients (25.7%) in the usual care group died within 28 days after randomization.

In patients hospitalized with Covid-19, the use of dexamethasone resulted in lower 28-day mortality among those who were receiving either invasive mechanical ventilation or oxygen alone at randomization but not among those receiving no respiratory support.

Tocilizumab in patients admitted to hospital with COVID-19 (RECOVERY): a randomised, controlled, open-label, platform trial

Effect of allocation to tocilizumab on 28-day mortality (A) and discharge from hospital within 28 days of randomisation (B)

RECOVERY Collaborative Group. Lancet 2021; 397: 1637–45
Hot news about vaccines
Hot news about vaccines

» Heterologous prime–boost vaccination
» Effectiveness of Covid-19 Vaccines against the B.1.617.2 (Delta) Variant
» 3rd booster vaccine in immune-suppressed patients
» Vaccine breakthroughs
## Current vaccines and their effectiveness

### Primary PREVENTION

<table>
<thead>
<tr>
<th>Vaccine/Company</th>
<th>Platform</th>
<th>Protection from hospitalisations or death&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Efficacy against milder disease&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>BNT162b2 Pfizer-BioNTech&lt;sup&gt;1&lt;/sup&gt;</td>
<td>mRNA in lipid nanoparticle</td>
<td>100%</td>
<td>95%</td>
</tr>
<tr>
<td>mRNA-1273 Moderna&lt;sup&gt;1,2&lt;/sup&gt;</td>
<td>mRNA in lipid nanoparticle</td>
<td>100%</td>
<td>94.1%</td>
</tr>
<tr>
<td>ChAdOx1 nCoV-19 (AZD1222) AstraZeneca&lt;sup&gt;1,3&lt;/sup&gt;</td>
<td>Non-replicating chimp adenovirus-DNA</td>
<td>100%</td>
<td>66.7% overall; 90% half-full dose 81.3% after longer prime-boost interval</td>
</tr>
<tr>
<td>Gam-COVID-Vac (Sputnik V) Gamaleya National Center&lt;sup&gt;1,4&lt;/sup&gt;</td>
<td>Ad26 and Ad5 adenovirus/DNA</td>
<td>100%</td>
<td>91.4%</td>
</tr>
<tr>
<td>JNJ-78436725 Johnson &amp; Johnson&lt;sup&gt;1,2&lt;/sup&gt;</td>
<td>Non-replicating human adenovirus/DNA</td>
<td>100%</td>
<td>66% overall</td>
</tr>
<tr>
<td>NVX-CoV2373 Novavax&lt;sup&gt;1,5,6&lt;/sup&gt;</td>
<td>Spike protein/RBD + Matrix M adjuvant</td>
<td>100%</td>
<td>89.3% UK 60% S. Africa</td>
</tr>
<tr>
<td>CoronaVac Sinovac&lt;sup&gt;7&lt;/sup&gt;</td>
<td>Spike protein + Aluminium hydroxide-based adjuvant</td>
<td>85–100% hospitalisation; 80% death</td>
<td>50–84%&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

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<sup>a</sup> Due to COVID-19.  
<sup>b</sup> Data from 5 studies across Turkey, Chile, Indonesia and Brazil.

mRNA: messenger RNA; RBD: receptor-binding domain.


Heterologous prime–boost vaccination with ChAdOx1 nCoV-19 and BNT162b2

**Figure:** Comparison of surrogate neutralisation activity induced by homologous and heterologous COVID-19 vaccine regimens

Dots represent the results from individual vaccinees analysed by the two study laboratories (appendix pp 2–3). *p* values from a Dunn’s test for multiple comparisons are shown above the graph. Median and interquartile ranges are indicated by red horizontal lines. Below the graph, the total numbers of individual participants, the numbers below the lower (<10) and above the upper (>10 000) cutoff of the surrogate neutralisation assay, and median values of each group are shown.

Tenbusch M et al. Lancet 2021, 29th July
Third Covid vaccine shot for people with weakened immune systems ‘very high priority,’ Fauci says

Federal health officials are working "as quickly as possible" to authorize a third Covid-19 vaccine shot for Americans with weakened immune systems, White House chief medical advisor Dr. Anthony Fauci said Thursday.

It is clear now that immunocompromised populations, in general, do not produce an adequate immune response after receiving two doses of a Covid vaccine, Fauci said.

“Immuno-compromised individuals are vulnerable,” Fauci said during a White House briefing. “It is extremely important for us to move to get these individuals their boosters, and we are now working on that and we will make

KEY POINTS

* U.S. officials are working quickly to authorize a third Covid-19 vaccine shot for Americans with weakened immune systems, White House chief medical advisor Dr. Anthony Fauci said.

* It is clear now that immunocompromised populations, in general, do not produce an adequate immune response after receiving two doses of a Covid vaccine, Fauci said.
Percent of subjects with antibody response after **two** mRNA vaccine doses by immunocompromising condition and study (n=63)

- Studies that compared response after 1st and 2nd dose demonstrated poor response to dose 1
- Antibody measurement and threshold levels vary by study protocol

Healthy Controls: 95%–100%

Darker blue color is hematologic cancers

![Graph showing antibody response by condition and study](https://www.cdc.gov/vaccines/acip/meetings/downloads/slides-2021-07/07-COVID-Oliver-508.pdf)
Anti–Receptor-Binding Domain (RBG) IgG Antibody Titers Measured 28 Days After the Third Dose of mRNA-1273 SARS-CoV-2 Vaccine in 159 Kidney Transplant Recipients

Horizontal dotted line indicates the cutoff for positivity (50 arbitrary units [AU]/mL). Blue lines indicate the antibody titers of kidney transplant recipients who seroconverted after the third dose (titers 50 AU/mL); orange lines, the evolution of antibody titers among nonresponders (titers <50 AU/mL). mRNA indicates messenger RNA.
Effectiveness of Covid-19 Vaccines against the B.1.617.2 (Delta) Variant

*Figure 1. Vaccine Effectiveness against the Alpha and Delta Variants, According to Dose and Vaccine Type.*

Shown is the effectiveness of one dose and two doses of the BNT162b2 and ChAdOx1 nCoV-19 vaccines, or either vaccine (“any”), against symptomatic disease with the B.1.1.7 (alpha) or B.1.617.2 (delta) variant of the severe acute respiratory syndrome coronavirus 2. I bars indicate 95% confidence intervals.
Methods:
• A retrospective multicentre cohort study of 17 hospitals included patients fully vaccinated with Pfizer/BioNTech's BNT162b2 vaccine who developed COVID-19 more than 7 days after the second vaccine dose and required hospitalization.

Results:
• A total of 152 patients were included, accounting for half of hospitalized fully vaccinated patients in Israel. Poor outcome was noted in 38 patients and mortality rate reached 22% (34/152).
• Notably, the cohort was characterized by a high rate of co-morbidities predisposing to severe COVID-19, including hypertension (108; 71%), diabetes (73; 48%), congestive heart failure (41; 27%), chronic kidney and lung diseases (37; 24% each), dementia (29; 19%) and cancer (36; 24%), and only six (4%) had no comorbidities. Sixty (40%) of the patients were immunocompromised.
• Higher viral load was associated with a significant risk for poor outcome. Risk also appeared higher in patients receiving anti-CD20 treatment and in patients with low titres of anti-Spike IgG, but these differences did not reach statistical significance.
Other variants of concern....

**New Results**

**SARS-CoV-2 Lambda variant exhibits higher infectivity and immune resistance**

Izumi Kimura, Yusuke Kosugi, Jaqi Wu, Daichi Yamasoba, Erica P Butiertanalca, Yuri L Tanaka, Yafei Liu, Kitaro Shirakawa, Yasuhiro Kazama, Ryosuke Nose, Yoshihito Horisawa, Kenzo Takahara, Akifumi Takami-Kondo, Hikasa Arase, The Genotype to Phenotype Japan (G2P-Japan) Consortium, Akatsuki Sato, So Nalagawa, Kei Sato

doi: https://doi.org/10.1101/2021.07.28.454085

This article is a preprint and has not been certified by peer review (what does this mean?).

**Summary**

SARS-CoV-2 Lambda, a new variant of interest, is now spreading in some South American countries; however, its virological features and evolutionary trait remain unknown. Here we reveal that the spike protein of the Lambda variant is more infectious and it is attributed to the T731l and L452Q mutations. The RSYLTPCD246-253N mutation, a unique 7-amino-acid deletion mutation in the N-terminal domain of the Lambda spike protein, is responsible for evasion from neutralizing antibodies.
World map of vaccinations

https://www.bloomberg.com/graphics/covid-vaccine-tracker-global-distribution/
All persons who were newly vaccinated during the period from December 20, 2020, to February 1, 2021, were matched to unvaccinated controls in a 1:1 ratio according to demographic and clinical characteristics. Study outcomes included documented infection with the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), symptomatic Covid-19, Covid-19–related hospitalization, severe illness, and death.
Thank you

Mary Addo
Christoph Boesecke
And
You for listening
COVID-19 social distancing guidelines in Scotland

**Please Keep a Safe Distance**

Enough room for a big friendly Highland cow

**Let's Kick Coronass Stay Six Feet Away**

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