Possible Treatments for COVID-19:

Bottom Line: President Trump announced he is pushing the FDA to fast track expanded production of treatments for novel coronavirus. Some of these treatments are already being used for the sickest hospitalized patients. Mild COVID-19 infection that does not require hospitalization does not require use of these medications; they should be reserved for moderate to severe infection. Here are some of those possible treatments.

Hydroxychloroquine (Plaquenil) and Chloroquine

Typical Use: lupus and other rheumatologic conditions, malaria

Why they might work in COVID-19:

1. Lab studies show that the medications may prevent the virus from entering inside individual human cells, therefore preventing those cells from getting infected.
2. Lab studies also demonstrate that the medications stop the growth of the virus directly
3. They are effective anti-inflammatory medications, and may reduce the inflammation, sometimes called 'cytokine storm' that leads to heart and lung problems as well as other organ failure in severe COVID-19 infection.
4. Hydroxychloroquine is a less toxic derivative of chloroquine and in lab studies was shown to be more potent than chloroquine against SARS CoV-2 the virus that causes COVID-19 disease.

Side effects: *Chloroquine* has potential side effects including damage to the heart, abnormal heart rhythms, nervous system side effects, vision problems, rashes, and low blood counts. Despite the many side effects, it is generally well-tolerated and is considered an "essential medicine" by the WHO. *Hydroxychloroquine* is generally considered to be safer with less side effects than chloroquine, however can still lead to an abnormal heart rhythm, and cause vision damage if used for extended time periods.

Accessibility: moderate (generic, moderately safe, inexpensive). These medications require prescription and oversight by a healthcare provider experienced with their use and side effect profile. Mild COVID-19 disease does not require specific antiviral medication for recovery and the supply of available medication needs to be preserved to be readily available for people who are sick enough to be hospitalized.

State of the research and development: There are several clinical trials in China and Europe for each medication. A lab study recently showed higher potency of hydroxychloroquine compared to chloroquine against the COVID-19 virus.

Remdesivir

Typical Use: Intravenous medication with broad anti-viral activity, still in its experimental phases but being used in moderate to severe cases of COVID-19 who are hospitalized and often requiring mechanical ventilation. This medication is available to patients with confirmed COVID-19 who meet other study criteria who are hospitalized at a center participating in the clinical trials and on a compassionate use basis from the pharmaceutical company, Gilead.

Why it might work in COVID-19: the medication incorporates itself into the RNA (building blocks) of the virus and prevents the virus from replicating (copying itself), therefore stopping viral growth. Animal studies show the medication can prevent infection of cells with MERS and SARS, as well as prevent clinical disease after infection with these viruses.

Side Effects: Unknown since still experimental, but may cause liver inflammation, other gastrointestinal side effects.

Accessibility: low (an experimental drug with high costs), available on a compassionate use basis through the FDA and pharmaceutical company that is developing it (Gilead), also available to hospitalized patients with COVID-19 who meet study criteria and are at a hospital participating in the clinical trial.

State of the research and development: 2 clinical trials initiated by Gilead for moderate and severe disease, 2 clinical trials in China, NIAID (part of NIH) has initiated clinical trial, compassionate use applications to FDA and Gilead

Sources:

Hydroxychloroquine, a less toxic derivative of chloroquine, is effective in inhibiting SARS-CoV-2 infection in vitro

Remdesivir and chloroquine effectively inhibit the recently emerged novel coronavirus (2019-nCoV) in vitro

Study to Evaluate the Safety and Antiviral Activity of Remdesivir (GS-5734™) in Participants With Severe Coronavirus Disease (COVID-19) - Full Text View

Study to Evaluate the Safety and Antiviral Activity of Remdesivir (GS-5734™) in Participants With Moderate Coronavirus Disease (COVID-19) Compared to Standard of Care Treatment - Full Text View

Hydroxychloroquine and azithromycin as a treatment of COVID-19

Hydroxychloroquine and azithromycin as a treatment of COVID-19: results of an open- label non-randomized clinical trial Philippe

https://pubmed-ncbi-nlm-nih-gov.eresources.mssm.edu/32150618/?from_term=Clinical+infectious+disease+hydroxychloroquine&from_sort=date&from_pos=1

https://pubmed-ncbi-nlm-nih-gov.eresources.mssm.edu/32171740/

https://www.ncbi.nlm.nih.gov/pubmed/32054787