

COVID-19 CHLOROQUINE & HYDROXYCHLOROQUINE UPDATE FOR OPTOMETRISTS

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Chloroquine (CQ) and hydroxychloroquine are oral prescription drugs used to treat malaria and certain autoimmune diseases. Chloroquine's use has been greatly replaced by hydroxychloroquine due to its significantly lower systemic toxicity. Hydroxychloroquine is commonly prescribed long term for the management of autoimmune conditions such as lupus and rheumatoid arthritis. Long term use of hydroxychloroquine can lead to irreversible macular toxicity, so it requires screening and routine monitoring by an optometrist or ophthalmologist.

Recently chloroquine and hydroxychloroquine have been at the forefront of investigational drugs with possible efficacy in the treatment of COVID-19 patients. Both have shown in-vitro activity against various coronaviruses, with hydroxychloroquine having greater in-vitro effect against SARS-CoV-2 or COVID-19. This has led to the use of hydroxychloroquine in the treatment of those hospitalized with COVID-19 in multiple countries including the United States. Much is currently unknown in regards to the true effect of hydroxychloroquine in combating COVID-19, and there are no data currently available from randomized clinical trials to guide physicians' use of the drug. Clinical trials are currently underway to investigate hydroxychloroquine's use in prophylactic treatment of COVID-19 as well as its efficacy in the management of patients with mild to severe COVID-19 symptoms. This information and much more about additional drugs to potentially target COVID-19 can be found on the Center for Disease Control's website at <https://www.cdc.gov/coronavirus/2019-ncov/hcp/therapeutic-options.html>.

The U.S. Food and Drug Administration (FDA) has issued an Emergency Use Authorization (EUA) to allow for the use of hydroxychloroquine to treat adults and adolescents >50kg who are hospitalized with COVID-19. The EUA emphasizes that there is no known optimal dose of treatment but suggests 800 mg on the first day followed by 400 milligrams for four to seven days. The EUA can be found at <https://www.fda.gov/media/136537/download>.

The American Academy of Ophthalmology updated their guidelines for chloroquine and hydroxychloroquine retinal screening in 2016. The guidelines currently state that a patient should have an examination within the first year of drug initiation to establish a baseline and rule out pre-existing pathology that may be a contraindication to hydroxychloroquine use. While the guidelines state that baseline testing with spectral domain-optical coherence tomography (SD-OCT) and automated visual field are not necessary for the baseline examination, they recommend these tests be performed in patients for whom

the fundus examination reveals abnormal findings, particularly macular findings or disease such as glaucoma that could affect the visual field screening.

After confirmation of normal ocular structure, and without presence of systemic risk factors for toxicity, patients do not have to be formally screened for 5 years per the guidelines. It is recommended to perform both an automated visual field and SD-OCT imaging at the 5 year screening visit. Additional tests such as multifocal electroretinography and fundus autofluorescence can be utilized if available. Risk factors that would warrant more frequent screening include higher than recommended daily dose (hydroxychloroquine > 5.0 mg/kg real weight or chloroquine >2.3 mg/kg real weight), renal disease, concomitant use of tamoxifen, and pre-existing macular disease. The new guideline offers detail explanations of how to perform and interpret appropriate screening tests. The full guideline can be found at <https://www.aao.org/clinical-statement/revised-recommendations-on-screening-chloroquine-h>.

Due to the short duration of hydroxychloroquine dosage that would be utilized for those hospitalized with COVID-19, it seems that there should be little concern for macular toxicity or need for retinal screening after treatment. In addition, it would currently be ill-advised to bring patients recently treated for COVID-19 into an out patient setting for such screening due to risk of exposure and spread of the disease. The EUA for hydroxychloroquine does state however that hydroxychloroquine is contraindicated "in the presence of retinal or visual field changes of any etiology." Consideration should be given in the future if prophylactic use of hydroxychloroquine is found to be beneficial leading to a situation where there is more long term use of the medication.



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