ANGIOMA ALLIANCE
because brains shouldn't bleed

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Consensus Statement by the Angioma Alliance Scientific Advisory Board Regarding COVID-19 and Cavernous Angiomas, and the COVID-19 Vaccine

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The Angioma Alliance Scientific Advisory Board continues to monitor any specific reports or emerging concerns about COVID-19 and cavernous angiomas. Results from a registry of cavernous angioma patients and COVID-19 will soon be published (*J Stroke Cerebrovasc Disease,* in press 2021). While numbers were small, **this study suggested a potential increased incidence of new symptomatic bleeding in solitary cavernous angiomas that are associated with a developmental venous anomaly among those with a recent COVID-19 diagnosis.** Beyond this report pending publication, we are aware of other CCM bleeds documented in familial cases in association with COVID-19 as well.

We are aware of reports of stroke in young patients, excessive clotting, and other neurologic manifestations of COVID-19 in the general population, but it remains unclear how these may impact cavernous angioma patients specifically. It is possible that a thrombosis in an associated venous anomaly branch may trigger a bleed in an associated cavernoma.

The registry data revealed no evidence that cavernous angioma patients are more likely to be infected, hospitalized, or die from COVID-19 than other patients of similar age, medical co-morbidities, and levels of disability. Persistent symptoms are common after recovery from COVID-19, and these may be difficult to distinguish from cavernous angioma symptoms. It is hence prudent to repeat magnetic resonance imaging (MRI) on patients with known cavernous angioma who report new headache, seizure, or other neurologic symptoms after known diagnosis of COVID-19.

Until further evidence arises, patients with cavernous angiomas with recent bleeds in the past year and associated new neurologic symptoms, surgery on the brain or spine in the past 6 months, persistent neurologic disability from prior bleeds, or active seizures may be a group considered as having a comorbidity and are potentially at higher risk with COVID-19. This is in addition to other cases designated high risk by the Center for Disease Control (CDC) because of age 65 years or older, heart disease, chronic lung conditions, immunocompromise, pregnancy, diabetes, severe obesity (BMI>40), chronic kidney disease undergoing dialysis, and liver disease.

COVID-19 vaccines are now widely available in the United States. Based on exceptional effectiveness data (greater than 90% protection from COVID-19 serious illness), the durability of benefit after a recommended second dose, and minimal reported side effects, **we strongly recommend that the CCM patient community seek vaccination through any one of the approved vaccines, including any recommended follow-up doses.** There is no reason to believe that CCM patients react any differently to these vaccines than the general population, and no scientific basis to fear the vaccine more than COVID-19, which has taken or interfered with so many lives.

For high-risk individuals regardless of vaccination status it is important to adhere to social distancing, wearing facial masks in indoor spaces, and practicing hygiene per CDC guidelines. It is also important to avoid contact with individuals (including family and caretakers) exposed to COVID-19, or exhibiting fever or other flu-like symptoms, until those persons prove negative testing for COVID-19, or until 14 or more days after their exposure, travel, or last symptoms. Caregivers and those individuals who are sharing a home with high-risk cavernous angioma patients should follow the same precautions.

We encourage patients to not delay medical care or imaging for cavernous angioma if recommended by your physician, including necessary travel for medical care and timely evaluation if new neurologic symptoms arise. Patients should continue their seizure medications, and other medications for medical conditions, and notify their cavernous angioma doctors about any positive test for COVID-19. It is recommended that patients in clinical trials continue to adhere to ongoing trial procedures and notify their trial investigators about positive testing for COVID-19.

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