such as Beck's triad and pulsus paradoxus may not be helpful. Conversely, the pathophysiological basis for the classic pulsus paradoxus, in the distinct form of pulseless paradoxus, can be helpful in supporting the diagnosis of cardiac tamponade in patients with a cLVAD.

Faris G. Araj, MD
Jun D. Sasaki, MD
University of Texas Southwestern Medical Center
Dallas

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Commercial Cannabidiol Caution: A New Gold Rush

To the Editor: We recently read with interest the review by VanDolah et al[1] in *Mayo Clinic Proceedings*, summarizing the emerging landscape of commercially available cannabidiol (CBD) preparations, which are now subject to consumption by the general public because of the purported health benefits of CBD. We agree with the authors in that an open discussion exploring patient use of such substances is necessary for a complete history as well as for establishing patient rapport. We would add a word of caution about the use of products and would also suggest readers of *Mayo Clinic Proceedings* consider additional factors when discussing commercial CBD use with patients.

First, although hemp farming is now legal under federal law, and for profit CBD commercial establishments are widespread, the actual sale of hemp-derived CBD food or supplement formulations remains illegal because plant-derived CBD (Epidiolex) is a Food and Drug Administration—approved drug.[2] Second, many commercial sellers of CBD imply medical claims for these products, which are both unsupported by clinical evidence and in violation of Food and Drug Administration labeling laws. Third, it should be recalled that the 2 large clinical trials that established CBD as an adjunct therapy for severe pediatric onset epilepsy syndromes—Dravet syndrome and Lennox-Gastaut syndrome—used doses of 10 to 20 mg/kg per day. Fourth, molecular analyses have revealed substantial deviation from the advertised label contents.[3] Finally, and most importantly, approximately 8% of vaping-associated lung injury was subsequent to exposure to CBD tinctures.[4] Although it is unknown whether CBD plays a direct pathogenic role in vaping-associated lung injury, the carrier solvents for these products have not been found to be safe at the currently administered levels and new pathogenic chemical entities may be generated through aerosolization. Ultimately, given that these substances are unregulated, possibly adulterated, and not found to be clinically effective, we urge the medical community to practice caution and forbearance with respect to patient-reported benefits of commercially acquired CBD.

With the passing of the Hemp Farming Act, academic institutions wishing to investigate hemp-derived cannabinoid products can now safely do so without being in violation of the Federal Controlled Substances Act. As a result of these new legal protections, there is an ongoing Mayo Clinic analysis of aerosolized CBD that will hopefully bring a better understanding of what potential risks lie ahead.

Caveat emptor.

Eugene L. Scharf, MD
Department of Neurology
Mayo Clinic
Rochester, MN

Alexandra M. Ward, BA
Jon O. Ebbert, MD
Primary Care Internal Medicine Research
Mayo Clinic
Rochester, MN

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In reply—Commercial Cannabidiol Caution: A New Gold Rush

We thank Scharf et al[1] for their thoughtful comments, which basically reinforce the cautionary notes we sounded in the original article.

We also agree that the legal environment remains challenging, with state and federal laws regarding the legality of cannabidiol (CBD) often appearing to be in conflict. The fact that CBD is now available as a drug

has led some authorities to state that it cannot simultaneously be a dietary supplement and hence the concerns raised by Scharf et al. However, to date, the Food and Drug Administration has not pursued this angle aggressively, and most of the action against CBD manufactures and/or sellers has been in response to unsubstantiated medical claims. The Food and Drug Administration has announced plans to release new guidance in the near future. Pending that announcement, we appear to be in limbo, where CBD remains readily available to consumers while government agencies continue to debate its long-term fate.

The fact that manufactures and sellers of CBD often make unsubstantiated medical claims was noted in our article but bears repeating.

We also noted that the CBD market is crowded with many products that do not contain the ingredients or the amounts found on the label. To help guide patients who choose to use a CBD or hemp oil product, we included in our article a section titled "Finding a Quality Product" to help offer guidance for consumers navigating this burgeoning market.

We also appreciate the added cautionary notes provided by Scharf et al with regard to the extra risks associated with vaping CBD (or any substance). Given space limitations, we were not able to discuss the many forms of CBD in detail and so we are grateful for the opportunity to echo the concerns about vaping in particular.

Harrison J. VanDolah, BA
Creighton University School of Medicine
Omaha, NE

Brent A. Bauer, MD
Karen F. Mauck, MD
Division of General Internal Medicine
Department of Internal Medicine
Mayo Clinic
Rochester, MN

Potential Competing Interests: Dr Bauer has received consultancy fees from Sovaris Aerospace (outside the submitted work). The other authors report no competing interests.

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Amikacin Liposome Inhalation Suspension as a Treatment Option for Refractory Nontuberculous Mycobacterial Lung Disease Caused by *Mycobacterium avium* Complex

To the Editor: We read with much interest the review by Shulha et al.[1] The article is a comprehensive and well-written overview of pharmacological treatment approaches of nontuberculous mycobacterial (NTM) diseases. Table 2 (titled "NTM Medication Dosing, Adverse Effects, and Recommended Monitoring"), however, did not include an approved treatment option for NTM lung disease caused by *Mycobacterium avium* complex (MAC), namely, amikacin liposome inhalation suspension (ALIS; Arikayce). Amikacin liposome inhalation suspension is the first Food and Drug Administration (FDA)—approved medication with a specific indication for refractory MAC lung disease (MAC-LD). It was granted accelerated approval by the FDA in September 2018 and is "indicated in adults who have limited or no alternative treatment options, for the treatment of *Mycobacterium avium* complex (MAC) lung disease as part of a combination antibacterial drug regimen in patients who do not achieve negative sputum cultures after a minimum of six consecutive months of a multidrug background regimen therapy."[2(p1)]

The accelerated FDA approval was based mainly on the results of the phase 3 CONVERT study (clinicaltrials.gov Identifier: NCT02344004),[3] which reported a more than 3-fold increase in culture conversion rates by month 6 when ALIS was added to a background multidrug regimen compared with those treated with their continued background regimen alone (n=65/224, [29.0%] vs n=10/112 [8.9%]; $P<.001$).[3] It should be noted that a rigorous definition of *culture conversion* was used in CONVERT in that patients had to have 3 consecutive monthly negative sputum cultures by month 6 to meet the primary end point. Importantly, data from CONVERT presented at American Thoracic Society annual meeting in May 2019 demonstrated that among patients with treatment-refractory disease who received ALIS in addition to a background regimen and met the primary end point of culture conversion by month 6, 80% (n=52) were confirmed culture negative at the end of treatment and 63% (n=41) remained culture negative 3 months after discontinuing all MAC treatments.[4] Because relapse and reinfection are common in MAC-LD, the durability of sputum conversion reported in CONVERT is particularly encouraging. The most common adverse reactions reported in CONVERT at the month-6 safety analysis were primarily respiratory (ALIS plus background regimen, 87.4%; background regimen alone, 50.0%), predominantly mild to moderate in intensity, and included dysphonia, cough, dyspnea, hemoptysis, and oropharyngeal pain.[3]

As noted in a 2012 review by Griffith and Aksamit,[5] "the choices for effective treatment of these patients [with refractory NTM lung disease] are depressingly sparse."[(p218)]