

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.

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**Potential Competing Interests:** The authors report no competing interests.

**Data Previously Presented:** This work was presented as a poster at the UT Southwestern — Texas Health Resources Cardiovascular Symposium on October 26, 2019, in Dallas, TX.

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<https://doi.org/10.1016/j.mayocp.2019.10.012>

## Commercial Cannabidiol Caution: A New Gold Rush



**To the Editor:** We recently read with interest the review by VanDolah et al<sup>1</sup> 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.<sup>2</sup> 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.<sup>3</sup> Finally, and most importantly, approximately 8% of vaping-associated lung injury was subsequent to exposure to CBD tinctures.<sup>4</sup> 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.

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**Potential Competing Interests:** Dr Scharf has received a research grant from the American Brain Foundation American Brain Foundation, has received payment for the Medical Cannabis CME lecture, and has stock holdings in GW Pharmaceuticals (all outside the submitted work). Dr Ebbert has received consultancy fees from Nesmah (outside the submitted work). The other author reports no competing interests.

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<https://doi.org/10.1016/j.mayocp.2019.10.026>

## In reply—Commercial Cannabidiol Caution: A New Gold Rush



We thank Scharf et al<sup>1</sup> 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