

## MEDICAL USE OF CANNABIS FOR DRY EYE DISEASE

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### Summary

The clinical value of cannabis in alleviating the symptoms of dry eye disease (DED) is limited at this time due to a lack of clinical evidence.

The Canadian Ophthalmological Society does not support the medical use of cannabis for the treatment of DED or its associated pain symptoms, due to its undesirable side-effects, including dry eye symptoms if smoked, and the absence of scientific evidence showing any beneficial effect at this time.

Other evidence-based, less harmful treatment modalities are available for DED and its associated symptoms.

### Full Policy Statement

The current debate on the medical use of cannabis is fundamentally a discussion of its medicinal properties compared to the risks posed by its continual use.<sup>1</sup> Over the years, cannabis-based medicine has been used for medical treatment of appetite stimulation, nausea, vomiting, diarrhea, mood disorders,<sup>1</sup> and neuropathic pain.<sup>2</sup>

The benefit of cannabis for DED has been scarcely studied. Recent data suggest that severe, refractory dry eye symptoms without clinical signs may be better characterized as neuropathic ocular pain rather than DED.<sup>3,4</sup> In such cases, cannabis can theoretically be beneficial; since two of its constituents,  $\Delta$ 9-tetrahydrocannabinol (THC) and cannabinoid have potential pain relieving and anti-inflammatory properties, respectively.<sup>5</sup> However, the lack of controlled route of administration of cannabis and its harmful side-effects creates barriers to studying this hypothesis.

Oral administration of THC results in variable absorption, with bioavailability usually below 15%.<sup>6</sup> Additionally, oral administration has been linked to many side-effects of the medication, particularly somnolence, sedation, confusion and psychosis.<sup>5,7,8</sup>

In addition to psychotropic side-effects, dry eye symptoms have been observed when cannabis is smoked.<sup>7,8,9</sup> As shown in studies of tobacco users, smoke exposure can contribute to DED by reducing the tear lipid layer, increasing tear osmolarity, and increasing symptoms of dryness.<sup>10</sup> In addition to dry eyes, recreational use of cannabis for greater than one year has been linked to corneal endothelial toxicity.<sup>11</sup>

Topical administration may limit systemic side-effects, however previous formulations have resulted in eye irritation<sup>6,12</sup> New vehicles that permit delivery of lipophilic compounds (e.g. THC) in an aqueous solution may conceptually be helpful in ocular delivery of THC and studying its effect on pain associated with DED.<sup>13</sup> This novel approach is currently being studied at the University of Cologne.<sup>14</sup>

Ultimately, the clinical utility of cannabis for the treatment of dry eye is limited by the absence of scientific evidence and is hypothetical at this stage. In addition to the undesirable side-effects, smoked cannabis can also contribute to worsening dry eye symptoms and corneal damage.

As such, the use of cannabis for the treatment of dry eye disease and its related symptoms is not supported at this time. There are safer and more effective evidence-based interventions available for dry eye disease.

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