

CADTH Reference List

Confocal Microscopy for the Diagnosis and Management of Neuropathic Corneal Pain

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Key Messages

- No literature was identified regarding the clinical utility of confocal microscopy in the diagnosis of neuropathic corneal pain.
- No literature was identified regarding the clinical utility of confocal microscopy in the management of neuropathic corneal pain.
- No evidence-based guidelines were identified for confocal microscopy in the diagnosis and management of neuropathic corneal pain.

Research Questions

1. What is the clinical utility of confocal microscopy in the diagnosis of neuropathic corneal pain?
2. What is the clinical utility of confocal microscopy in the management of neuropathic corneal pain?
3. What are the evidence-based guidelines for confocal microscopy in the diagnosis and management of neuropathic corneal pain?

Methods

Literature Search Methods

A limited literature search was conducted by an information specialist on key resources including MEDLINE, the Cochrane Database of Systematic Reviews, the international HTA database, the websites of Canadian and major international health technology agencies, as well as a focused internet search. The search strategy comprised both controlled vocabulary, such as the National Library of Medicine's MeSH (Medical Subject Headings), and keywords. The main search concepts were confocal microscopy and neuropathic corneal pain. No search filters were applied to limit retrieval by study type. Where possible, retrieval was limited to the human population. The search was also limited to English-language documents published between January 1, 2016 and March 22, 2021. Internet links were provided, where available.

Selection Criteria and Summary Methods

One reviewer screened literature search results (titles and abstracts) and selected publications according to the inclusion criteria presented in Table 1. Full texts of study publications were not reviewed. The Overall Summary of Findings was based on information available in the abstracts of selected publications. Open-access full-text versions of evidence-based guidelines were reviewed when abstracts were not available and relevant recommendations were summarized.

Table 1: Selection Criteria

Criteria	Description
Population	Adult patients with neuropathic corneal pain including those with severe dry eyes not responding to treatment
Intervention	In vivo corneal confocal microscopy
Comparator	Q1-Q2: No comparator Any other intervention used to diagnose corneal neuralgia/corneal neuropathic pain Q3: Not applicable
Outcomes	Q1-Q2: Clinical utility (e.g., safety, short- and long-term risks, quality of life, reduction of symptoms, frequency of follow-up) Q3: Recommendations regarding the use of confocal microscopy for the diagnosis and management of neuropathic corneal pain; recommendations regarding the frequency of follow-up for confocal microscopy
Study designs	HTAs, SRs, RCTs, non-randomized studies, evidence-based guidelines

HTA = health technology assessment; Q = question; RCT = randomized controlled trial; SR = systematic review.

Results

No relevant health technology assessments, systematic reviews, randomized controlled trials, or non-randomized studies were identified regarding the clinical utility of confocal microscopy in the diagnosis or management of neuropathic corneal pain. Furthermore, no evidence-based guidelines were identified regarding confocal microscopy in the diagnosis and management of neuropathic corneal pain.

References of potential interest that did not meet the inclusion criteria are provided in Appendix 1.

Overall Summary of Findings

No relevant literature was found regarding the clinical utility or evidence-based guidelines for confocal microscopy in the diagnosis or management of neuropathic corneal pain; therefore, no summary can be provided.

References

Health Technology Assessments

No literature identified.

Systematic Reviews and Meta-analyses

No literature identified.

Randomized Controlled Trials

No literature identified.

Non-Randomized Studies

No literature identified.

Guidelines and Recommendations

No literature identified.

Appendix 1: References of Potential Interest

Non-Randomized Studies

Proof of Diagnostic Capacity

1. Aggarwal S, Kheirkhah A, Cavalcanti BM, Cruzat A, Jamali A, Hamrah P. Correlation of corneal immune cell changes with clinical severity in dry eye disease: An in vivo confocal microscopy study. *Ocul surf.* 2021 Jan;19:183-189. [PubMed](#)
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4. Mahelkova G, Jirsova K, Seidler Stangova P, et al. Using corneal confocal microscopy to track changes in the corneal layers of dry eye patients after autologous serum treatment. *Clin Exp Optim.* 2017 May;100(3):243-249. [PubMed](#)
5. Zhao H, Chen JY, Wang YQ, Lin ZR, Wang S. In vivo Confocal Microscopy Evaluation of Meibomian Gland Dysfunction in Dry Eye Patients with Different Symptoms. *Chin Med J.* 2016 Nov 05;129(21):2617-2622. [PubMed](#)

Alternative Population and Proof of Diagnostic Capacity

6. Colorado LH, Alzahrani Y, Pritchard N, Efron N. Assessment of conjunctival goblet cell density using laser scanning confocal microscopy versus impression cytology. *Contact lens anterior eye.* 2016 Jun;39(3):221-226. [PubMed](#)

Review Articles

7. Hwang J, Dermer H, Galor A. Can in vivo confocal microscopy differentiate between sub-types of dry eye disease? A review. *Clin Exp Ophthalmol.* 2021 Mar 26. [PubMed](#)
8. Han SB, Liu YC, Mohamed-Noriega K, Tong L, Mehta JS. Objective Imaging Diagnostics for Dry Eye Disease. *J Ophthalmol.* 2020 Jul;2020:3509064. [PubMed](#)
9. Patel DV, Zhang J, McGhee CN. In vivo confocal microscopy of the inflamed anterior segment: A review of clinical and research applications. *Clin Exp Ophthalmol.* 2019 Apr;47(3):334-345. [PubMed](#)
10. Chan TCY, Wan KH, Shih KC, Jhanji V. Advances in dry eye imaging: the present and beyond. *Br J Ophthalmol.* 2018 Mar;102(3):295-301. [PubMed](#)
11. Matsumoto Y, Ibrahim OMA. Application of In Vivo Confocal Microscopy in Dry Eye Disease. *Invest Ophthalmol Vis Sci.* 2018 Nov;59(14):DES41-DES47. [PubMed](#)
12. Fasanella V, Agnifili L, Mastropasqua R, et al. In Vivo Laser Scanning Confocal Microscopy of Human Meibomian Glands in Aging and Ocular Surface Diseases. *Biomed Res Int.* 2016;2016:7432131. [PubMed](#)
13. Xie W. Recent advances in laser in situ keratomileusis-associated dry eye. *Clin Exp Optim.* 2016 Mar;99(2):107-112. [PubMed](#)

Additional References

Proof of Diagnostic Capacity

14. Feldman BH, Bunya V, Woodward MA, et al. Confocal Microscopy. *American Academy of Ophthalmology EyeWiki.* 2021. https://eyewiki.org/Confocal_Microscopy Accessed 2021 Apr 29.