



Cost-effectiveness of corneal crosslinking for progressive keratoconus

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Nationwide reduction in the number of corneal transplantations for keratoconus following the implementation of cross-linking

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But what are the costs of this reduction???



Methods: stochastic Markov-type model

- Two identical cohorts of 1000 patients (2000 eyes) were created:
 - One cohort treated with CXL
 - One cohort no CXL treatment
- Patients followed over the course of a lifetime
- Disease progression based on two RCTs:
 - Wittig-Silva et al¹
 - O'Brart et al²
- Chance of keratoplasty based on CLEK study³
- Costs of keratoplasty and CXL based on Dutch studies^{4,5}

1. Wittig-Silva C, Chan E, Islam FM, Wu T, Whiting M, Snibson GR. A Randomized, Controlled Trial of Corneal Collagen Cross-Linking in Progressive Keratoconus: Three-Year Results. *Ophthalmology*. 2014;121(4):812-821.

2. O'Brart DP, Chan E, Samaras K, Patel P, Shah SP. A randomised, prospective study to investigate the efficacy of riboflavin/ultraviolet A (370 nm) corneal collagen cross-linkage to halt the progression of keratoconus. *Br J Ophthalmol*. 2011 Nov;95(11):1519-24.

3. Zadnik K, Barr JT, Edrington TB, et al. Baseline findings in the Collaborative Longitudinal Evaluation of Keratoconus (CLEK) Study. *Invest Ophthalmol Vis Sci*. 1998;39(13):2537-46.

4. Godefrooij DA, van Geuns P, de Wit GA, Wisse RPL. What Are the Costs of Corneal Cross-linking for the Treatment of Progressive Keratoconus? *J Refract Surg*. 2016;32(5):355-355.

5. Biggelaar van den FJHM, Cheng YYY, Nuijts RMM a, et al. Economic evaluation of endothelial keratoplasty techniques and penetrating keratoplasty in the Netherlands. *Am J Ophthalmol*. 2012;154(2):272-281.e2.



Results: Cost-effectiveness of CXL

Every 13 CXL treatments prevent 1 corneal transplantation

CXL treatment prevents deterioration of visual acuity and quality of life

Every €54,384 / \$59,822 invested in CXL results in the gain of 1 QALY (Quality-Adjusted Life Year)



Conclusions on cost-effectiveness of CXL

Quality of life is severely affected by bad visual acuity¹

CXL is a cost-effective method to prevent:

- corneal transplantations
- deterioration of visual acuity
- loss of quality of life

Opportunity:

Treating patients in an earlier disease phase improves cost-effectiveness



Questions? Ask the author!

