

# CXL FOR KERATOCONUS

Standard procedure effective in vast majority of patients.

Howard Larkin reports

**T**he standard Dresden protocol for corneal crosslinking (CXL) provides stable long-term improvements in visual acuity and keratometry for about 90% of patients, Rudy MMA Nuijts MD, PhD told Refractive Surgery Day at the 2016 American Academy of Ophthalmology Annual Meeting in Chicago, USA.

Moreover, epithelium-off CXL also provides persistent improvement for up to four years in 80-90% of children, and may reduce need for corneal transplants by 25%, he reported.

## EFFICACY DEMONSTRATED

A 2015 meta-analysis of six CXL trials found decreases of -1.65D mean K-max, and -2.05D in mean astigmatism in CXL-treated patients compared with controls. Best spectacle-corrected vision improved by -0.10 logMAR, or one Snellen line, and cylinder by -0.39D. (Li. *PLoS One* 2015;10:e0127079.)

A second paper analysing 75 studies found a small amount of regression after 24 months (*Meiri. Cornea* 2016;35:417). In Dr Nuijts' own series, CXL outcomes were stable over four years, with mean K, K-max and steep K values all continually declining out to 48 months. Best-corrected vision was also stable over four years in this study at the Maastricht University Medical Centre, The Netherlands.

Looking at long-term follow-up studies of five years or more, CXL outcomes are quite stable on average, with failure rates, defined as progression of 1.0D or more, of 0-11%, Dr Nuijts noted. In children, studies with four years or more follow-up show a continuous effect of decreased K-max and improved corrected distance vision, with failure rates from 6-22%. Mean regression in K-max and improvement in distance vision were both greater in children than in adults.

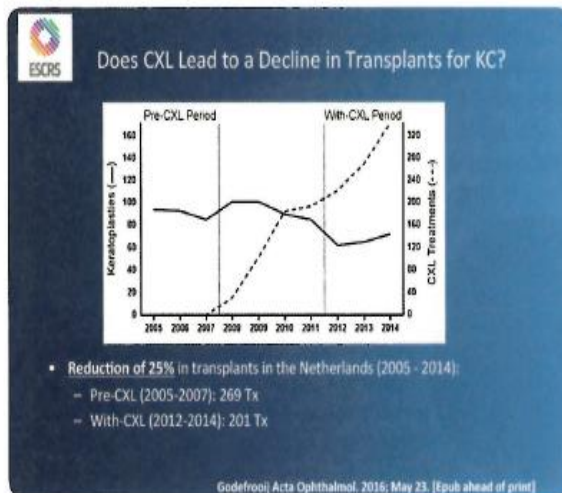
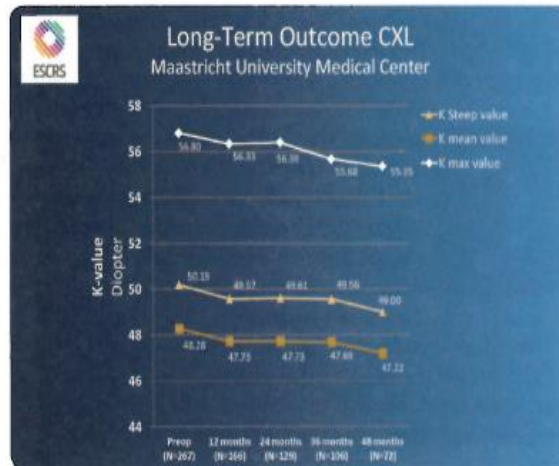
Preliminary data from The Netherlands corneal transplant registry suggests CXL may reduce the need for transplants by 25%, Dr Nuijts said.

However, assessing CXL outcomes has been hampered by a lack of well-designed randomised clinical trials,



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Rudy MMA Nuijts MD, PhD



- Reduction of 25% in transplants in the Netherlands (2005 - 2014):
  - Pre-CXL (2005-2007): 269 Tx
  - With CXL (2012-2014): 201 Tx

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Courtesy of Rudy MMA Nuijts MD, PhD

due in part to variable definitions of progression, Dr Nuijts said.

Among the varied indications for progressive keratoconus are K-max increase of 1.0D or more in one year; significant change in myopia and/or astigmatism in six months; and three consecutive topographies in six months showing a mean central K increase of >1.5D or mean central corneal thickness decrease of >5.0%. Uniform outcome measures and better trials are needed to prevent delays in bringing innovations to patients, he emphasised.

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