Optometrist Guide for CTAK Referral

Corneal Tissue Addition for Keratoplasty (CTAK)



Keratoconus significantly and negatively impacts patient quality of life. Though quality of life can be improved with specialty contact lenses, patients still suffer when not wearing lenses. Keratoconus patients typically experience three distinct vision states: uncorrected vision, spectacle-corrected vision, and contact lens-corrected vision. *While specialty contact lenses effectively support daily visual function, significant unmet needs persist in both uncorrected and spectacle-corrected vision.*

Corneal Tissue Addition for Keratoplasty (CTAK) addresses these unmet needs by reshaping the cornea, enhancing visual acuity when patients are not wearing contact lenses.

CTAK Overview

CTAK is a minimally invasive intrastromal lamellar keratoplasty procedure designed specifically for keratoconus. In certain cases it may also be used in post refractive corneal ectasia. Unlike traditional keratoplasty methods, CTAK does not remove the patient's existing corneal tissue. Instead, it adds sterile, preserved corneal tissue. This tissue is precisely customized in shape to augment the individual patient's corneal curvature using an advanced femtosecond laser, the Ziemer Z8 Neo. By improving corneal shape, CTAK can significantly enhance uncorrected and spectacle-corrected visual acuity, offering improvements not achievable with prior treatment modalities. Notably, the corneal tissue used in CTAK originates from stromal caps of corneas processed for DMEK and DSAEK procedures; tissue that would otherwise be discarded. This careful resource utilization optimizes the impact of each donor cornea, ethically and effectively honoring the gift of donation. Additionally the surgeon receives a surgical plan guide which aids in precise placement of the tissue. Along with specially designed surgical instrumentation, this facilitates the procedure and ensures results are similar from surgeon to surgeon. In a clinical trial evaluating the effect of CTAK on patients with moderate to severe keratoconus, CTAK improved uncorrected vision by an average of 6 lines (from 20/300 to 20/80) and spectacle corrected vision by 3.5 lines (20/80 to 20/40).

Identifying Candidates

Optometry is crucial in identifying suitable candidates for CTAK and guiding them through the referral process. CTAK is an option for nearly all levels of severity of keratoconus. Generally the best served patients are those with best corrected spectacle visual acuity of 20/25 or worse. Rather than adhering strictly to specific clinical criteria, any patient expressing interest in vision improvement with or without glasses or reduced dependency on specialty lenses should be referred for CTAK evaluation. The ultimate determination of surgical candidacy rests with the surgeon after comprehensive assessment. A practical approach to evaluating interest in CTAK is to ask patients two simple, yet insightful questions, the first: "What is your life like without your specialty contact lenses?". Patients typically respond by describing significant daily struggles—difficulty

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performing simple tasks such as cooking, anxiety regarding dependency on lenses, concerns about emergency situations, and pushing through the discomfort of overwearing their contact lenses because they are unable to function without them. The second question: "If your vision in glasses could be improved, would that improve your quality of life?" typically elicits a strong desire for improved spectacle-corrected vision, allowing periodic breaks from contact lens use, and functional vision once contact lenses are removed. Patients that have had Intacs implanted and had less than desirable results may be able to undergo CTAK after removal of the Intrastromal Corneal Ring Segment.

Crucial Communication

Optometrists should emphasize that CTAK is neither intended to replace specialty contact lenses nor corneal cross-linking. Patients will still need crosslinking to stop progression and specialty lenses to best improve vision. Instead, CTAK provides a therapeutic option to enhance corneal shape and thus uncorrected and spectacle-corrected vision, complementing existing treatments. Additionally, the improvements in corneal shape from CTAK frequently expand available contact lens options for patients, occasionally allowing a patient to be successful in less complex lenses such as toric soft lenses.

Perioperative Care

Preoperatively, patients will be asked to discontinue contact lens wear on the eye undergoing CTAK so that accurate tomography maps can be captured on the Oculus Pentacam. These maps drive the custom design of the tissue as well as placement so accurate corneal data not influenced or warped by a contact lens is necessary. On the day of the procedure the surgeon will use a femtosecond laser to cut an intrastromal channel and implant the CTAK tissue. Sutures and bandage contact lenses are rarely, if ever, needed to close the incision site as it is generally self sealing. The post operative topical medication is similar to the medications used after refractive surgery, an antibiotic QID for 1 week and a steroid on taper from QID reducing frequency by one drop each week until discontinuation on week 4. NSAID is rarely ever used after CTAK.

On post-op day 1, the tissue will be easily seen on slit lamp examination, patients may have some uncorrected vision improvement over baseline vision. At 1 week the tissue will have mostly deturgest. At 1 month, the cornea should be completely healed and all topical medications discontinued. At this visit a refraction is indicated. The vision will stabilize by month 3, but the nearly final vision will be achieved at 1 month.

Contact Lens Management

In the case of corneal GP, piggyback, hybrid, and soft lenses, a refitting will be necessary after CTAK and the process of prescribing a lens can occur at 3-4weeks post operatively. If a scleral lens was worn preoperatively the same lens can be placed on the eye and evaluated, typically minor modifications to the lens design, such as increased sagittal depth, or optics may be needed.

Need Help Referring to a CTAK Surgeon?

CorneaGen can help connect with local ophthalmologists who perform CTAK.
Please fill out the form at CorneaGen.com/CTAK and one of our representatives will contact you.

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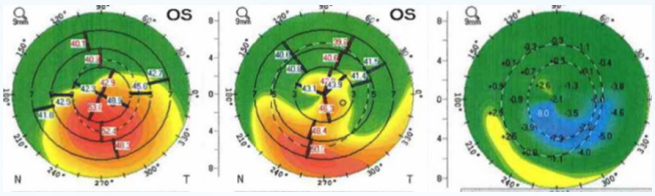
Corneal Tissue Addition for Keratoplasty (CTAK)

Real-world CTAK Cases

Case Study 1

A 28-year-old female with keratoconus achieved improved uncorrected distance visual acuity (UDVA) and 8 diopters of central flattening.

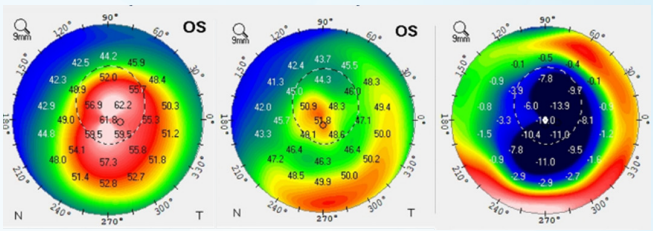
PRE-OP | 3-MONTH | DIFFERENCE



Case Study 2

A 35-year-old contact lens-intolerant patient experienced 11 diopters of central flattening and gained stable vision with glasses after CTAK.

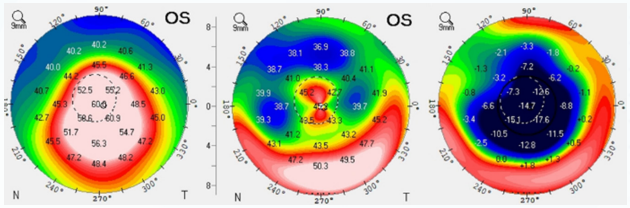
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Case Study 3

A 19-year-old contact lens-intolerant patient with previous cross-linking achieved 17 diopters of flattening.

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Contact us for more information or assistance.

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Quick Reference Guide

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Corneal Tissue Addition for Keratoplasty (CTAK) Overview

- Minimally invasive intrastromal lamellar keratoplasty for keratoconus. Adds custom shaped donor stromal tissue to improve the recipient's cornea shape. Preserves native tissue; no tissue removal. Excellent clarity and long-term biocompatibility.
- **Average vision improvement:** 6 lines uncorrected vision, 3 lines spectacle-corrected vision. Many patients achieve functional UCVA. May enable simpler lens options post-op (e.g., toric soft lenses).
- **Complements, not replaces:** Cross-linking (stops progression), Specialty lenses (optimize vision).

Candidates

- **Question:** "What is life like without your lenses?" and "Would improved vision in glasses improve your life?"
- **Answer:** Interested in improved vision without contact lenses.
- Any keratoconus patient with BCVA 20/25 or worse in glasses.
- Patients with post-refractive corneal ectasia may be candidates.
- Prior Intacs patients may be eligible after segment removal.

Perioperative Care

- **Pre-Op:** Discontinue lens wear pre-op for accurate tomography (Pentacam).
- **Post-Op:** No sutures or BCLs typically required. Post-op drops: Antibiotic QID x1 week. Steroid taper over 4 weeks. Vision stabilizes by 1 month; refraction at 1 month.

Contact Lens Management

- **GP, piggyback, hybrid, soft lenses:** refit at 3–4 weeks post-op.
- **Scleral lenses:** pre-op lens may need only minor adjustments, evaluate on eye at 3-4 weeks post-op.

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