Advanced Cornea Processing for UT-DSAEK

High-Pressure Anterior Chamber (HPAC) Technique

High-Pressure Anterior Chamber (HPAC), Lions World Vision Institute's proprietary technique for preparing ultrathin DSAEK grafts, is reliable, accurate, and consistently produces corneal grafts 40-70 microns.[1] This technique demonstrates less endothelial stress and cell loss. HPAC was developed by Lions World Vision Institute (LWVI) and introduced in 2012.[2] This advanced procedure utilizes a proprietary nomogram to determine the most precise calibrations taking physiological variables into account, such as cutting depth, donor age and stromal hydration.

Most Predictable UT-DSAEK Thickness

The amount of pressure used for the HPAC technique is significantly higher than the standard methods used by most eye banks. Limited high-pressure exposure of the cornea while mounted on an artificial anterior chamber reduces the amount of corneal edema and folds prior to processing.

LWVI's HPAC UT-DSAEK technique outperforms other techniques in achieving central graft thickness (CGT) of less than 100 µm as documented in a study published in Cornea (June 2021).[3]

Less than 100µm

- LWVI's HPAC 99.2%[1]
- Moria ACP 72.5%[3]
- Traditional IV Technique 58.6%[3]

When targeting UT-DSAEK preparation less than 70µm, LWVI's HPAC technique is successful 81.6%.[1]

Benefits of HPAC Processing for UT-DSAEK

- **Consistently provides UT-DSAEK 40-70 microns**
- **Provides larger stromal bed size (1-1.5mm wider than standard pressure methods)**
- **Reduces endothelial stress for rapid recovery post-processing**
- **Decreases endothelial cell loss**
- **Decreases processing failure rate**
- **Reduces surgeon stress, eliminating need for replacement cornea**
- **Increases yield and honors the "gift of sight"**

LWVI's certified technicians prepare up to 75 corneas weekly for endothelial keratoplasty.

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So the world can see.

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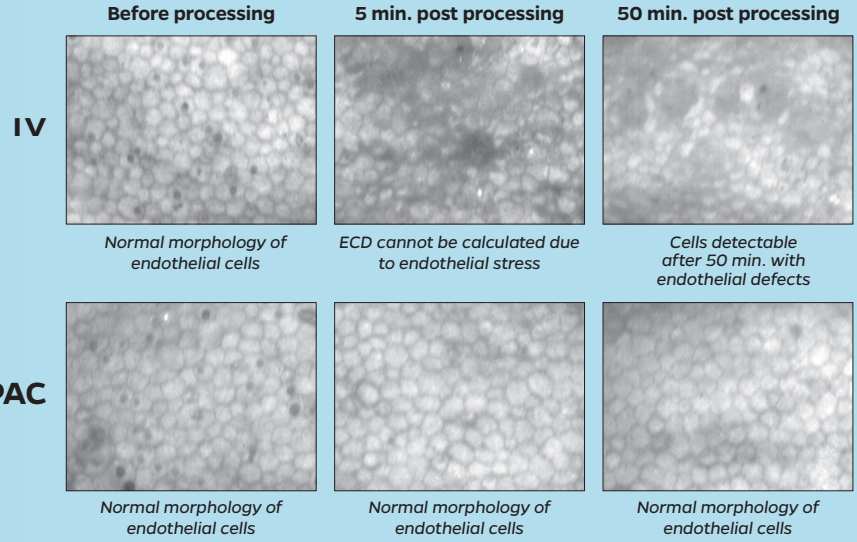
Endothelial Stress During Processing and Recovery Time Comparison

Endothelial cells recover 10 times faster with HPAC



UT-DSAEK Preparation with Less Endothelial Cell Stress and Cell Loss

Microkeratome preparation is stressful on corneal endothelium. Comparative studies show endothelial cells recovered 10 times faster with HPAC than with standard pressure.[4] With less stress on the endothelium during preparation, the cell recovery time is as little as 5 minutes. Standard pressure used with the IV method demonstrated endothelial stress up to 50 minutes.

The HPAC technique stabilizes the cornea during microkeratome preparation and limits endothelial cell loss. Comparative studies show 4 times greater endothelial cell loss using standard artificial anterior chamber pressure compared to LWVI's HPAC technique.

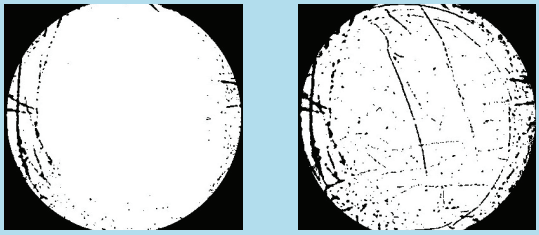
Register your DSAEK specifications to receive DSAEK grafts prepared with LWVI's HPAC technique for your next cases at LWVI.org.

1. E. Abdullayev MD, MBA, CEBT; D. Moore CEBT; A. Kurz BS – "Reliability of Novel Microkeratome Technique in Preparation of Donor Grafts with Targeted Thickness 70 µm and Less for Ultrathin DSAEK." Free paper abstract, ASCRS Symposium & Congress. 2022 April 25.
2. E. Abdullayev MD, MBA, CEBT; N. Desai MD; C. Miller MPH – "Single Pass Ultra-Thin DSAEK Grafts – Overview of the 55 Grafts Prepared in the Eye Bank" Free paper abstract, EBAA 2012 Scientific Symposium, June 2012.
3. R. Clerici, R. Ceccuzzi, R. Fausto, C. Tinelli, M. Rosaria Di Palma, G. Mantegna, I. Riva, M. Busin, G. De Angelis, L. Quaranta – "Single-Pass Microkeratome and Anterior Chamber Pressurizer for the Ultrathin Descemet-Stripping Automated Endothelial Keratoplasty Graft Preparation." Cornea. 2021 Jun 1;40(6):755-763. doi: 10.1097/ICO.0000000000002607.
4. E. Abdullayev MD, MBA, CEBT; K. Talbot MD; M. Gray MD; N. Sprehe BS – "Corneal endothelial cell health and recovery time after ultrathin DSAEK graft prepared with single pass high pressurized anterior chamber (HPAC)." Free paper abstracts, ASCRS Symposium & Congress. 2019 May 6.

Endothelial Cell Loss — Image J Analysis

LWVI's HPAC technique prepares ultrathin DSAEK grafts and preserves endothelial cell health

IV = 7.5% cell damage

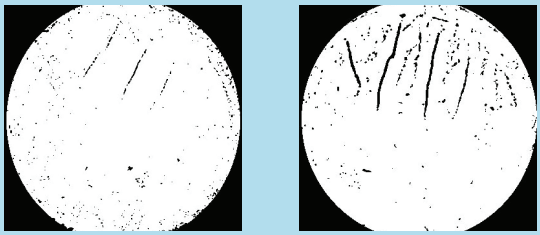


2.8% cell damage *before processing*

10.3% cell damage *post-processing*

HPAC = 1.7% cell damage

4 times less endothelial cell loss



1.9% cell damage *before processing*

3.6% cell damage *post-processing*

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