



Transversal Ultrasound

Roger F. Steinert, MD
University of California Irvine



Evolution of Phaco U/S Technology


Traditional longitudinal ultrasound
↓
Micropulse “cold” phaco/power modulation
Pulse shaping
↓
New-generation ultrasound
Torsional, Transversal



Evolution of Phaco U/S Technology


Areas of ongoing study

- Phaco tip
- Phaco energy waveforms
- Tip-fragment interaction
- Understanding and enhancing cavitation
- Interaction of mechanical and cavitation forces



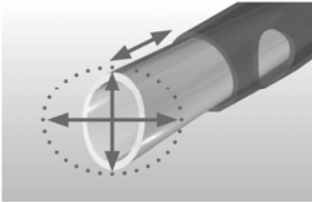
Lateral Motion

- Achieved with both torsional and transversal ultrasound
- Advantages:
 - Increase cutting efficiency by emulsifying lens material in more than one direction
 - Reduce repulsion of nuclear material
 - Increase followability
 - Reduce energy and trauma




WHITESTAR Signature™ System with Fusion™ Fluidics

Ellips™ Transversal Ultrasound



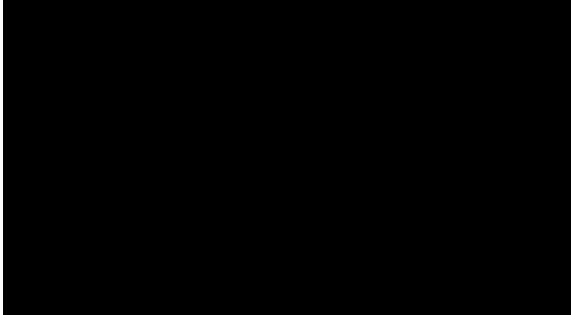
- Longitudinal (forward/backward) combined with transversal motion (elliptical)
- Optimized with WHITESTAR® Micropulse Technology




Handpiece




ELLIPS Transversal Ultrasound: Concept

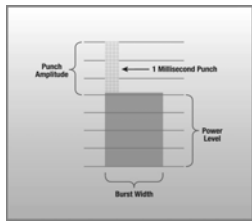


ELLIPS Transversal Ultrasound: Comparison




ELLIPS Transversal Ultrasound

- All the advantages of WhiteStar *combined with* new transversal motion
 - Micropulse
 - Pulse Shaping
 - Advanced Fusion Fluidics



ELLIPS Transversal Ultrasound

- Straight or bent-tip needle
- Intuitive tool - Minimal to no learning curve
- Ideal parameters to maximize capabilities?



Torsional vs. Transversal

<p style="text-align: center;"><u>Torsional</u></p> <ul style="list-style-type: none"> • Choose or alternate between torsional and longitudinal mode • Kelman-style bent-tip needle • Challenging to maintain suction 	<p style="text-align: center;"><u>Transversal</u></p> <ul style="list-style-type: none"> • Use transversal and longitudinal modes simultaneously • Straight or bent-tip needle • More easily maintain suction with bent tip
--	--

Improved Phaco

- Better followability across the board
- Efficiency gains:

Improved Phaco

- Less turbulence and trauma to the eye
- ↓
- Clearer corneas post-op (short term)
 - Less endothelial cell loss (long term)
 - Lower incidence of significant complications
 - Better patient and surgeon experience



Conclusions

- ELLIPS Transversal Ultrasound facilitates safe and efficient removal of very soft to very hard nuclei with minimal energy and minimal stress on the corneal endothelium and other ocular structures
- It offers the surgeon more tip options and a wide range of parameters with all the advantages of WhiteStar micropulsing and fluidics control

