All-laser LASIK after suction loss
The solid state femtosecond laser accounts for an increasing percentage of flaps created in LASIK procedures. Proponents cite predictable flap thickness and fewer complications as potential advantages over conventional mechanical microkeratomes. However, occasionally intraoperative suction loss leads to incomplete flap creation, requiring a second pass. How well do those cases do compared to regular single pass procedures? Spanish researchers conducted a study of 42 eyes comparing visual outcomes in eyes that had undergone a LASIK flap creation with a single pass of an IntraLase femtosecond laser in one eye and a double pass in the fellow eye, followed by ablation with a Visx S2 laser. The study found that 12 months after surgery, visual acuity, refractive outcomes, and anterior corneal higher order aberrations were comparable between eyes. The authors note a need for further long-term studies using wavefront-guided excimer laser ablations and larger patient populations are desirable to evaluate possible differences, including corneal biomechanical changes and newer-generation femtosecond laser-created flaps.


Optical ray tracing – beyond wavefront
Customised excimer LASIK ablations currently rely on corneal topography or whole-eye wavefront technology. However, critics note that these fail to consider the multiple lens structure of the eye and fail to address all optical errors of the eye, resulting in a clinical outcome that may be poorer than expected. A new study suggests that optical ray tracing may be the next step in custom ablation. Researchers conducted a multicentre study of 127 eyes with moderate to high myopic astigmatism that underwent custom LASIK ablation based on a new optical ray-tracing algorithm. Approximately 84 per cent of 111 eyes available for follow-up at three months postoperatively had uncorrected distance acuity of at least 20/20. All were within 1 D of the intended correction, with 96 per cent within 0.5 D. Uncorrected distance visual acuity in eyes treated for high myopic astigmatism was better than in those undergoing wavefront-guided LASIK. The researchers conclude that the new system, which does not require a nomogram, is safe, efficacious and predictable.


Long-term outcomes with Kamra inlay
The Kamra (AcuFocus) corneal inlay is under investigation as a potential solution for presbyopia. This corneal inlay is designed to increase the depth of field using the principle of small-aperture optics to restore near and intermediate visual acuity without significantly affecting distance vision in emmetropic hyperopes. Austrian researchers who did some of the first clinical studies with the inlay now report three-year postoperative follow-up data. A prospective study enrolled 32 patients. Mean uncorrected near visual acuity improved from Jaeger 6 preoperatively to 11 at three years. Mean uncorrected intermediate vision improved by an average of 2.09 lines. Mean uncorrected distance acuity was 20/20. However, nine eyes (28.3 per cent) lost one line of corrected distance acuity and one eye lost more than two lines. Moreover, 15.6 per cent of patients reported severe night-vision problems, and 6.3 per cent (versus 87.5 per cent preoperatively) reported being dependent on reading glasses. The design of the inlay has continued to evolve along with the implantation technique, the researchers note.