Throughout the latter half of the twentieth century, a series of disruptive innovations and hotly debated issues resulted in general consensus for standard cataract surgery and agreement on the ideal anatomic location for intraocular lenses (IOL); namely, within the capsular bag. Sir Harold Ridley envisioned this outcome from the inception of the IOL, stating “...the site for the prosthesis should be, if possible, just where nature had placed a biconvex lens throughout the animal kingdom.”

Now, in-the-bag implantation is not only standard practice but also a necessity for many monofocal and premium IOL styles, including one-piece acrylic, plate haptic, and toric IOLs. In striving for maximum achievable refractive outcomes from cataract surgery, we are beginning to inspect the impact of the most subtle aspects of “effective lens position.” Evidence is mounting regarding the effect of absolute capsular stability and IOL positioning issues within the bag, including IOL centration and tilt, on final visual outcomes, especially with toric and multifocal IOLs.

In this issue, Kránitz and colleagues provide further evidence on the importance of capsulorrhexis parameters on ultimate IOL centration and tilt, demonstrating subtle differences with femtosecond laser capsulotomies in both of these positional parameters. These findings support the authors’ previous work regarding minimal IOL decentration with femtosecond laser capsulotomy and the utility of this device in otherwise challenging cases where traditional capsulotomy approaches may have resulted in loss of capsular integrity necessitating alternate IOL placement location.

Alió and colleagues have reported the efficacy of a novel rotationally asymmetric multifocal IOL, and in this month’s issue, provide intriguing data that suggest capsular tension ring (CTR) placement, even in seemingly normal capsules, improves outcomes with this IOL. These results may stimulate a new field of study evaluating IOL stability and function with routine CTR placement. Whether surgeons will adopt this strategy of CTR placement in “normal” capsules remains to be seen.

Even in cases with anatomically well-centered IOLs, functional decentration may occur with regard to IOL centration relative to pupillary position. Although this has minimal impact for most monofocal and toric IOLs, this can cause significant deterioration of visual quality and patient satisfaction with multifocal IOLs. Solomon and colleagues describe a relatively straightforward technique to improve relative pupil and multifocal IOL centration using argon laser pupilloplasty to functionally shift and center the pupil over the multifocal optic. This technique may significantly improve symptoms in select patients and thereby reduce the incidence of multifocal IOL exchange in these potentially challenging cases.

In more challenging surgical cases, with insufficient capsular support for in-the-bag IOL placement due to a variety of mechanisms, where should the IOL be placed? What is the optimal strategy for IOL placement and fixation in these cases, and what IOLs can be safely positioned outside of the capsular bag? Furthermore, what if an IOL is initially placed within the capsule but becomes functionally decentered or otherwise unstable? Recent studies challenge current thinking on IOL positioning in these unique situations and may expand our treatment options, some with controversial techniques.

Sutured scleral IOL fixation has been a useful technique for many years; however, significant complications may arise, including late dislocation. In recent years, fibrin glue-assisted scleral IOL fixation has been evaluated, and Ganekal and colleagues report similar visual outcomes with significantly less postoperative complications with the fibrin glue technique. Another novel approach to this situation is the nontraditional use of retro-iris fixation of a hyperopic phakic iris claw IOL, as reported by Hara et al. Ease and reproducibility of surgico
cal technique will likely ultimately determine which of these techniques becomes most readily utilized.

In a more controversial report this month, Pallikaris and colleagues report the relative success and functionality of sulcus implantation of the Crystalens HD (Bausch & Lomb, Rochester, New York) pseudoaccommodating IOL. All sulcus-implanted cases were preoperatively unplanned, and although only a small series of eyes are reported, there were no differences in outcomes between the Crystalens HD IOLs placed within the capsular bag and sulcus. These results defy most of the proposed mechanisms by which the Crystalens is theorized to provide pseudoaccommodation, including the flexible haptics allowing for movement during accommodative actions from ciliary muscle contraction and forward vitreous mass displacement, when placed in the capsular bag. Despite the success of these cases, the Crystalens is not designed or recommended for sulcus implantation. These findings provide more questions than answers as to the real mechanisms at work in these IOLs and the potential efficacy of pseudoaccommodative IOLs.

When in-the-bag placement is not possible, a variety of new strategies are available to maximize outcomes. The extent to which these novel strategies are adopted will depend on further reports of their safety and efficacy, or lack thereof, and the feasibility of use in our fellow surgeons’ hands.

REFERENCES