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BT FEATURE

Ophthalmologist Develops Surgery Outcomes Software

Australian ophthalmologist **Noel Alpins**, MD has developed the **ASSORT** surgical outcome and management program that enables ophthalmologists to analyze the outcome of various refractive surgical procedures, including **Laser Assisted In Situ Keratomileusis** (LASIK), **Photorefractive Keratectomy** (PRK), **Automated Lamella Keratoplasty** (ALK) and **Radial Keratotomy** (RK) as well as cataract surgery and glaucoma treatments. The program, which was developed using **Borland** company's *Paradox* relational database software, operates on **Microsoft Windows®** and incorporates Alpin's astigmatism-analysis methodology.

"The astigmatism-analysis methodology determines how well a surgeon is treating astigmatism," Alpins told this newsletter. "It also enables more effective planning of the surgery by employing both spectacle and corneal shape astigmatism values. By knowing the astigmatic values prior to performing surgery, i.e., corneal shape or the lenses, surgeons can compare the preoperative and the postoperative values to determine if the treatment has been effective." If the procedure was not effective, "the software can help the surgeons determine what went wrong and how to adjust for it."

The software program allows eye surgeons to determine if the laser beam has been aligned with the eye, or if there has been an alignment problem with the laser or the eye, Alpins explained. "The software also tells the surgeon if the laser power has been adjusted too high or too low during the treatment."

Using this program, ophthalmologists can plan and analyze the results of cataract and refractive surgery to achieve minimal postoperative astigmatism; identify and correct errors in technique or laser problems that result in overcorrections, undercorrections or off-axis astigmatic treatment; select intraocular lens power during cataract surgery and plan the size and location of cataract incisions to minimize postoperative astigmatism; and produce statistical tables, charts and scatter plots for use in presentations and publications.

The astigmatism-analysis method builds on earlier vector-analysis approaches, incorporating new concepts such as **Target Induced Astigmatism** (TIA) — what the surgeon hopes to accomplish; **Surgically Induced Astigmatism** (SIA) — what the surgeon actually accomplished; and **Difference Vector** (DV) — how far the surgeon missed. The **Correction Index** is determined by the ratio of SIA to TIA, and is optimally "1." The **Coefficient of Adjustment**, the inverse of the correction index, "quantifies the modification needed to the initial surgery plan to achieve a correction index of 1," explained Alpins. Another important concept is the **Index of Success**, which is calculated by dividing the DV by the TIA.

The software also can be used "to assist in the selection of intraocular lens power during cataract surgery, and plan the size and location of cataract incisions to minimize postoperative astigmatism.

Alpins predicts that, "In the future, it is highly probable that refractive surgeons will be rated by their respective indices." **Contact:** ASSORT, 7 Chesterville Rd., Cheltenham, Victoria 3192, Australia; Ph: +011 +61 +3 9 584-6966; Fax: +011 +61 +3 9 585-0995; in the U.S., Ph: (800) 345-1632. Index: Refractive surgery, vector analysis, topography; Topography, refractive surgery, vector analysis. BT