Terms Used for the Analysis of Astigmatism

To the Editor:

An article published in the January/February 2006 issue of the *Journal of Refractive Surgery*, "Standardized Analysis of Correction of Astigmatism by Laser Systems that reshape the Cornea" by Eydelman et al[1] should have acknowledged that key concepts embedded in the proposed ANSI standard it describes were first propounded in papers published in 1993[2] and 1997.[3]

The essence of the novel approach to the analysis and treatment of astigmatism lies in the need to address "non-zero targets," which are prevalent and unavoidable in any astigmatic analysis.[2,3] The methodology developed to address this problem relies on corneal or spectacle analysis of numerous elements of the eye, combined with a mathematical structure to analyze the relationship between treatments and outcomes. These two papers, which defined the approach to the problem, are well known in the ophthalmic community. Indeed, they are referenced in several papers cited in the Eydelman article, and must have emerged in the course of the "extensive literature review" that the authors conducted.

Although the authors state "there has been no consensus on terminology" in vector analysis, the set of terms proposed in 1993 has become widely used in the field. It is therefore counterproductive for the authors to alter terms and apply new names to these parameters and calculated values. In some cases, the new names are so similar to the original ones that there is no apparent valid reason for change; the alterations can only create confusion in the ophthalmic community (Table).

I agree with the authors' expressed desire to "identify a common, minimum set of analyses and a presentation format for adequate evaluation of safety and effectiveness of new astigmatism-correcting devices." My 1993 article suggested exactly that point.[2]

The lack of appropriate acknowledgement of seminal prior work, as well as the factual and methodological problems within the Eydelman et al article that are beyond the scope of this letter, are disappointing.

The authors should rethink their position and recommendations. They should acknowledge the previous work that they now promote and they should revert to the original terminology I suggested to avoid initiating ongoing confusion. Failure to correct these shortcomings does the whole field a disservice.

TABLE

Astigmatism Terms

Alpins Method	Eydelman et al
Magnitude of Error	Error of Magnitude
Angle of Error	Error of Angle
Difference Vector	Error Vector
Index of Success	Error Ratio
Correction Index[4]	Correction Ratio
Target Induced Astigmatism Vector	Intended Refractive Correction

REFERENCES

1. Eydelman MB, Drum B, Holladay J, Hilmantel G, Kezirian G, Durrie D, Stulting RD, Sanders D, Wong B. Standardized analyses of correction of astigmatism by laser systems that reshape the cornea. *J Refract Surg.* 2006;22:81-95.
2. Alpins NA. A new method of analyzing vectors for changes in astigmatism. *J Cataract Refract Surg.* 1993; 19:524-533.
3. Alpins NA. Vector analysis of astigmatism changes by flattening, steepening and torque. *J Cataract Refract Surg.* 1997; 23:1503-1514.
4. Alpins NA. New method of targeting vectors to treat astigmatism. *J Cataract Refract Surg.* 1997;23:65-75.

Noel Alpins, FRANZCO, FRCOphth, FACS
Victoria, Australia

Reply:

We would like to express our sincere regrets that Dr Alpins felt our paper lacked appropriate acknowledgement of some of his prior work. We are well aware of Dr Alpins' significant contributions to the field of astigmatism analysis. We specifically cited his 2001 paper entitled "Astigmatism Analysis by the Alpins Method"[1] to credit his prior work.

Our paper reports the collaborative work of the American National Standard Institute (ANSI) Astigmatism Project Group. The Group was charged with identifying nomenclature best suited for reporting and evaluating astigmatic results, specifically for those produced by excimer laser systems. The nomenclature and analyses adopted were not prepared or published in haste, but were adopted after 4 years of consideration by the ANSI committee attended by representatives from academia, industry, and government.

As we discussed in our article, numerous articles on vector analysis of astigmatism have appeared in the literature, some going back to the 19th century. For the benefit of the readers, we decided to limit the number of citations. Our purpose was to provide the readers with a concise, pertinent reference list. Although we did not cite Dr Alpins' articles from 1993[2] and 1997,[3] we did cite his 2001 article that referred to these earlier papers. As such, we did not intend to diminish Dr Alpins' contributions.