The Effect of Surgeon Learning on Intraoperative Wavefront Aberrometry Over 1 Year

Kevin Waltz, OD, MD[1]
Nathan Smith, MD[1]
Brenda Wahl, OD[1]

ASCRS Boston, MA

[1]Eye Surgeons of Indiana

PURPOSE

– To evaluate the surgical outcomes at one practice utilizing intraoperative wavefront

– To determine the effect of surgeon experience and learning while using this technology

METHODS

– Retrospective case control study of 687 eyes receiving cataract surgery with intraoperative wavefront aberrometry

  • Outcomes were divided into 5 sequential time periods of approximately 3 months each with 144, 145, 146, 141, and 111 eyes respectively

– All eyes received preoperative optical biometry and topography as well as intraoperative wavefront aberrometry

METHODS

– For the implanted lens, each method made a prediction that was compared to the achieved outcome

– For cases in which the intra-op wavefront shifted the surgeon's initial lens selection, the **measured refractive outcome** was compared to a **theoretical outcome** that would have been expected with the initial lens choice.
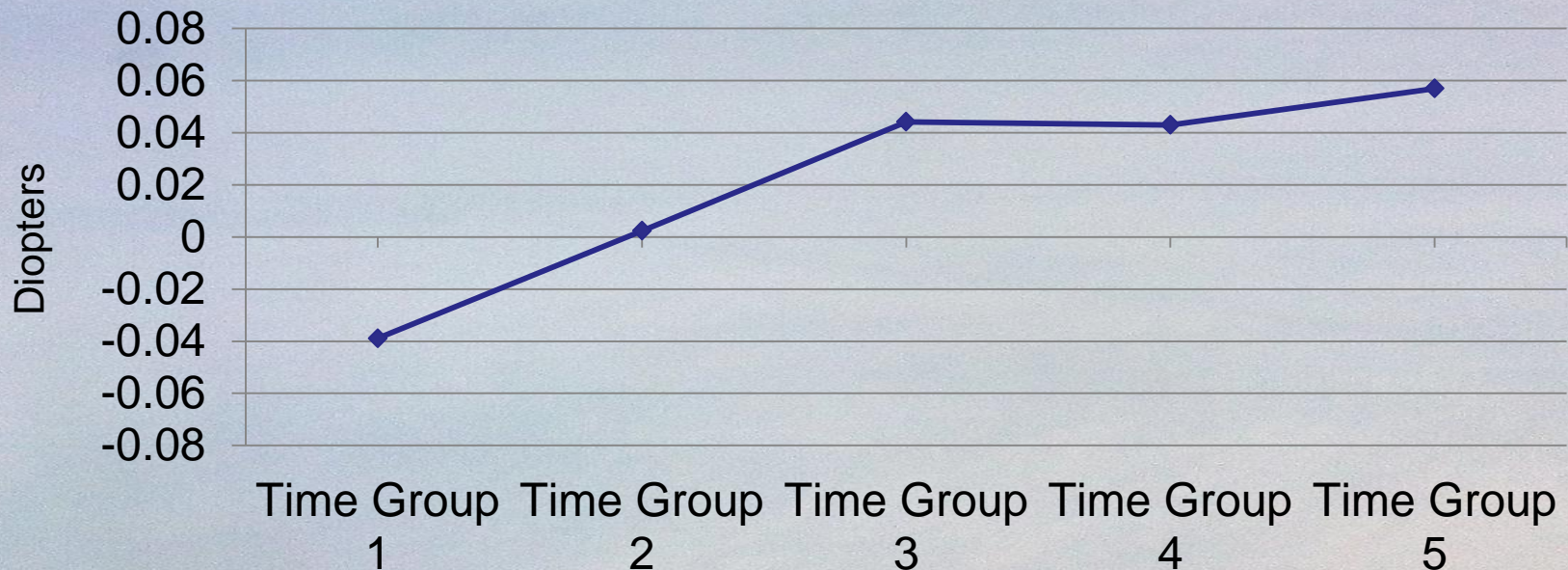
Accuracy of Pre-op Predictions
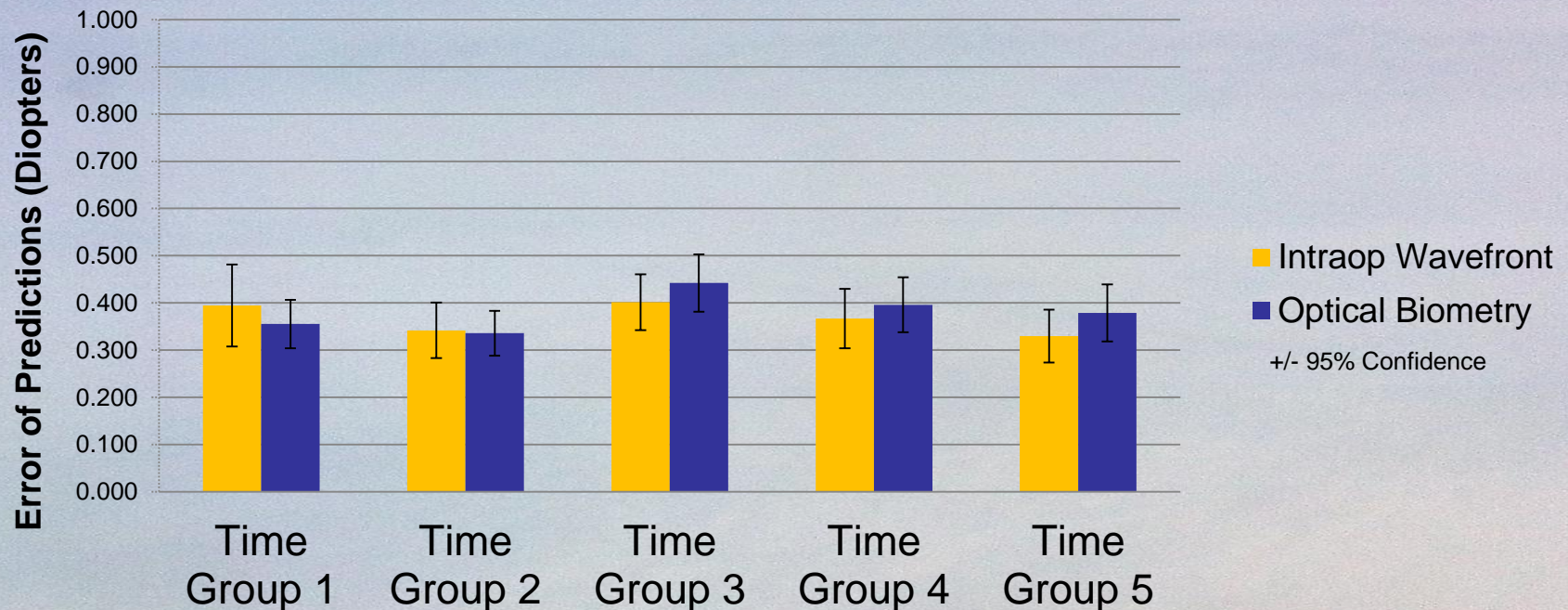
– *Cumulative Case-by-Case Analysis:* **Intraoperative Wavefront made the closer prediction** more often than Optical Biometry alone (p<0.0001)

Accuracy of Pre-op Predictions

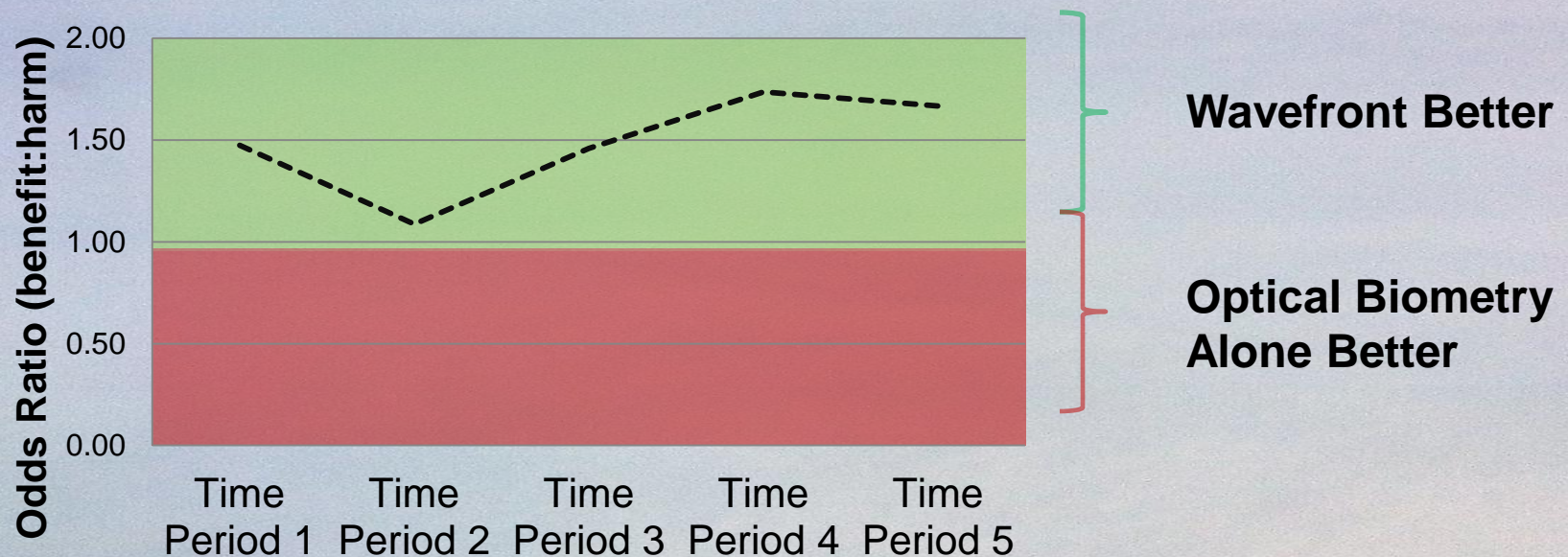**Relative Benefit of Intraoperative Wavefront Over Time**

Results demonstrate an increasing benefit from using intraoperative wavefront over time

-Benefit gains statistical significance (p=0.035) in Time Group 5

Changing SPHERE Power

Subset: If wavefront predicted a different sphere power than biometry, how likely was it to produce a more accurate result?
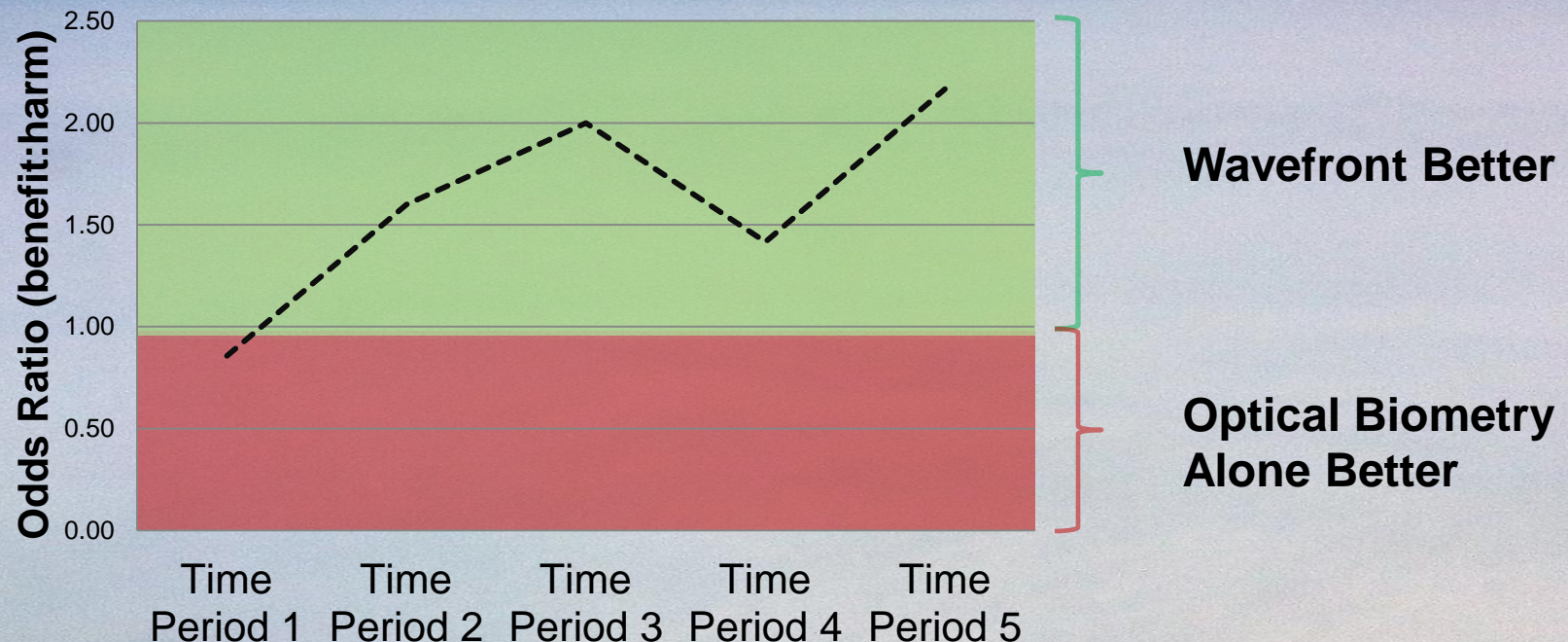

Odds Ratio >1 (**Green**): Wavefront recommendation **improved** outcomes (avg)

Odds Ratio ≤1 (**Red**): Wavefront recommendation **did not improve** outcomes (avg)

Changing CYLINDER Power

Subset: If wavefront predicted a different cylinder power than biometry, how likely was it to produce a more accurate result?

Odds Ratio >1 (**Green**): Wavefront recommendation **improved** outcomes (avg)

Odds Ratio ≤1 (**Red**): Wavefront recommendation **did not improve** outcomes (avg)

CONCLUSION

–   Using intraoperative wavefront to modify lens selection improves mean sphere and cylinder outcomes as compared to optical biometry alone

–   There was a learning curve in adopting intraoperative wave