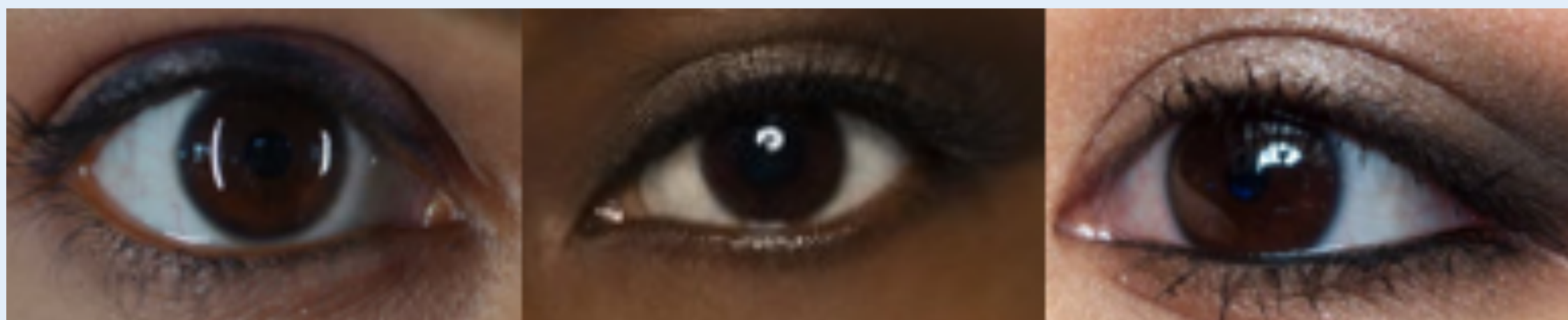


# Eye Color Does Not Alter Automated Pupillometer Readings

DaiWai M. Olson RN, Venkatesh Aiyagari MD, Byron Carlisle RN, Thuy-Tien Ho PA, Folefac Atem PhD, Sonja E. Stutzman PhD

## Background

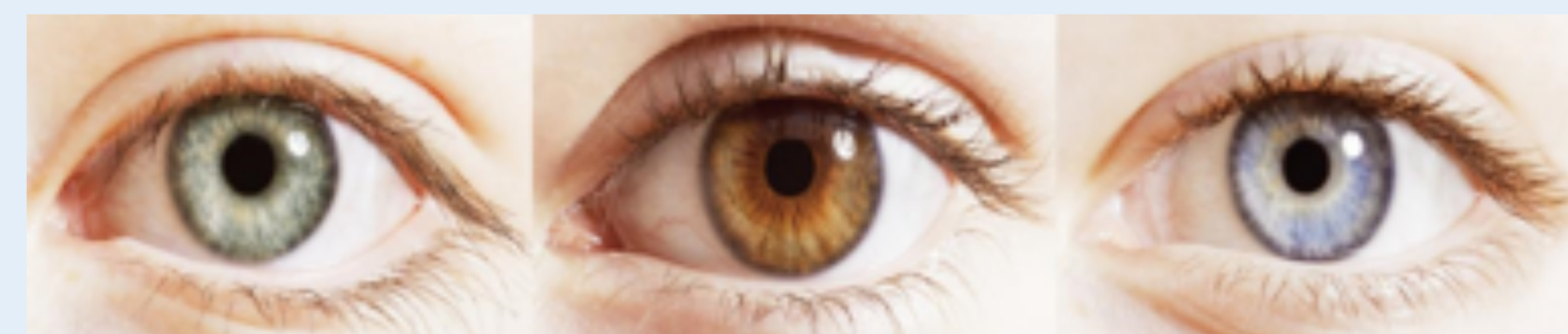
Pupillary assessments, a standard of care in managing neurointensive patients, have an impact on clinical decision making, further assessments, and intervention. Olson et al. (2016) showed that pupillary assessments with a pen light can be unreliable, especially when a pupil is abnormal.



A variable that may increase difficulty is eye color, with darker colors potentially more difficult to assess. The NeuroOptics Pupillometer provides an objective measure of pupil size and the Neurological Pupil Index™ (NPi), which is an algorithm developed to remove subjectivity of the pupillary light reflex evaluation.



A patient's pupil measurement (including variables such as size, latency, constriction velocity, dilation velocity, etc.) is compared against a normative model of pupil reaction to light and graded by the NPi™ on a scale of 0 to 5.



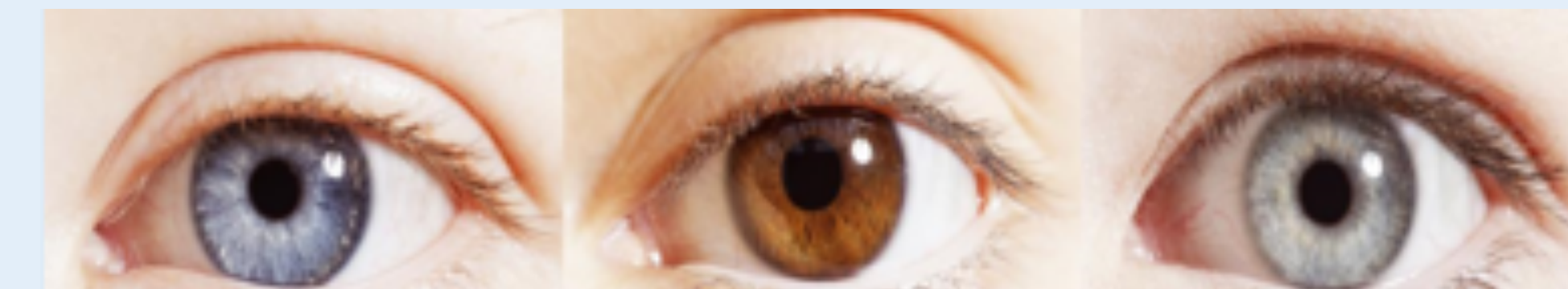
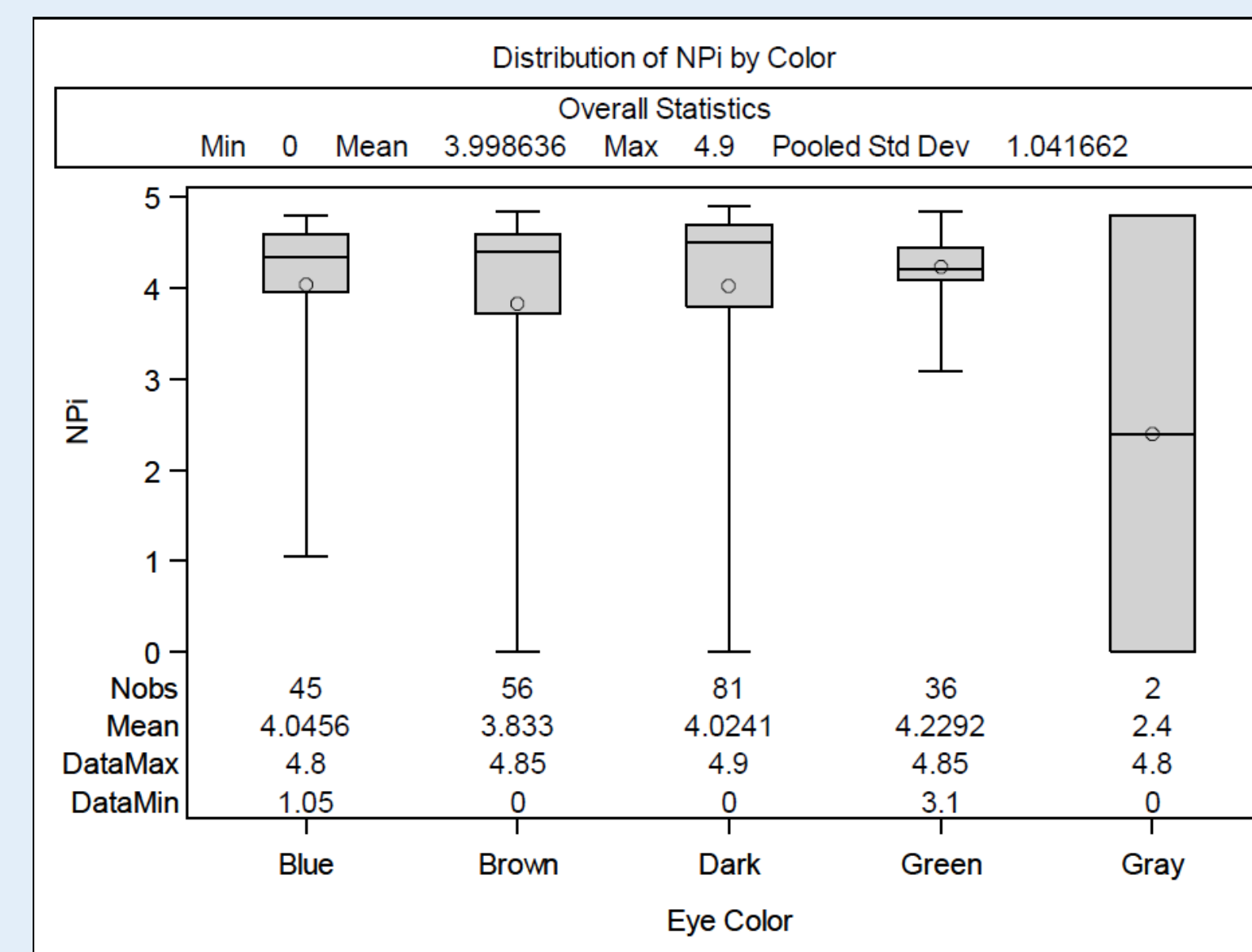
American Academy of Ophthalmology:

- 32 % blue or grey eyes
- 15 % blue, grey or green eyes with brown or yellow flecks
- 12 % green or light brown eyes with minimal flecks
- 16 % brown eyes with dark specks
- 25 % uniformly brown eyes



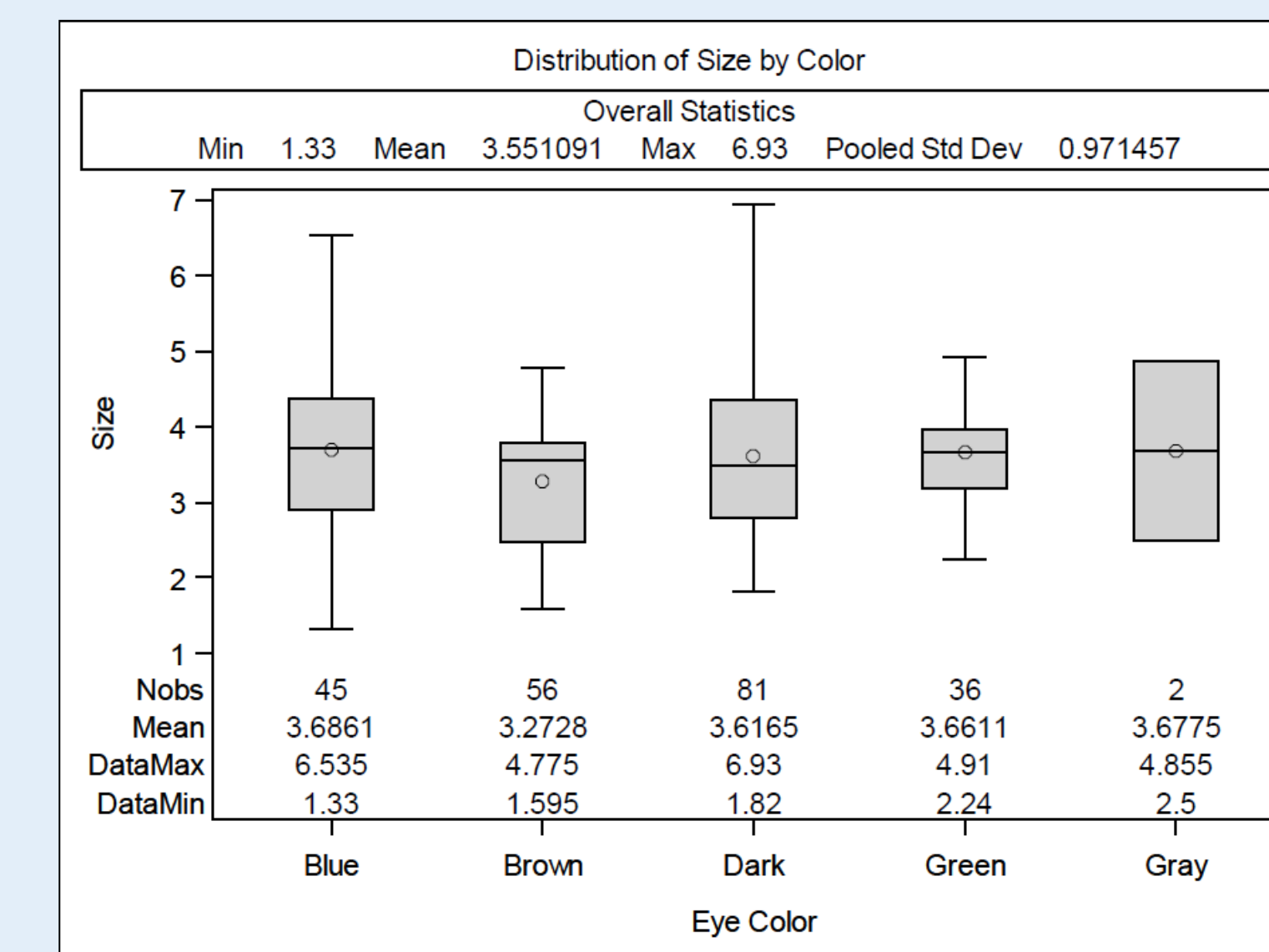
## Methods

The END PANIC registry was developed to collect a large dataset of variables to better understand central tendencies of pupillary assessments in critically ill patients. Patient data is collected on a routine basis by gathering information from the Pupillometer eye piece then linking this information to the electronic medical record information. Patient eye color is a unit variable of the dataset that is collected when the research collects the eye piece. This is done by either asking the patient their eye color or by physically opening the lid to see the patient's eye color.



## Results

Eye colors include: blue (n=90), light brown (n=63), dark brown (n=121), green (n=45), grey (n=6), other (n=5). There was no significant difference (p=0.3) in mean NPi by eye color comparing blue (m=4.0), light brown (m=3.8), dark brown (m=4.0), green (m=4.1), grey (m=2.4), and other (m=3.0). When considering the left and right eye separately there was no significant difference in NPi comparing right eye (m=3.8) and left eye (m=3.9; p=0.5)..



## Conclusion

**The pupillary light reflex as measured by the NPi does not differ based on eye color.**