

# IOI Power Calculation in the Pediatric Population Using the Kane Formula

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# Kane Formula



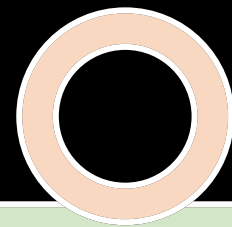
Original article

## Comparison of the Kane formula with existing formulas for intraocular lens power selection

Benjamin J Connell,<sup>1</sup> Jack X Kane<sup>2</sup>

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Comparative Study > J Cataract Refract Surg. 2020 Apr;46(4):591-597.

doi: 10.1097/j.jcrs.0000000000000087.

> Ophthalmology. 2020 Aug;127(8):1037-1042. doi: 10.1016/j.ophtha.2020.02.008. Epub 2020 Apr 9.

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Jack X Ka  
Grant R S

Comparative Study > Ophthalmology. 2020 Nov;127(11):1472-1486.

doi: 10.1016/j.ophtha.2020.04.039. Epub 2020 May 4.

> J Cataract Refract Surg. 2020 Sep;46(9):1236-1239. doi: 10.1097/j.jcrs.0000000000000235.

Intraocular  
hyperopia  
more dio

Jack X Kane <sup>1</sup>, Ro

> Am J Ophthalmol. 2020 Sep;217:81-90. doi: 10.1016/j.ajo.2020.04.035. Epub 2020 May 6.

Accuracy of New Generation Intraocular Lens  
Calcula

Xuhua Tan <sup>1</sup>,  
Zhenzhen Liu

> Am J Ophthalmol. 2021 Mar;223:100-107. doi: 10.1016/j.ajo.2020.09.019. Epub 2020 Sep 18.

Accuracy of Axial Length Measurements in Eyes with  
Length

Huanhuan Che

> J Cataract Refract Surg. 2020 Nov;46(11):1501-1507. doi: 10.1097/j.jcrs.0000000000000308.

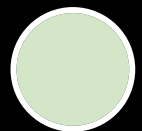
Intraocular lens power calculation in the elderly  
population us  
with existing

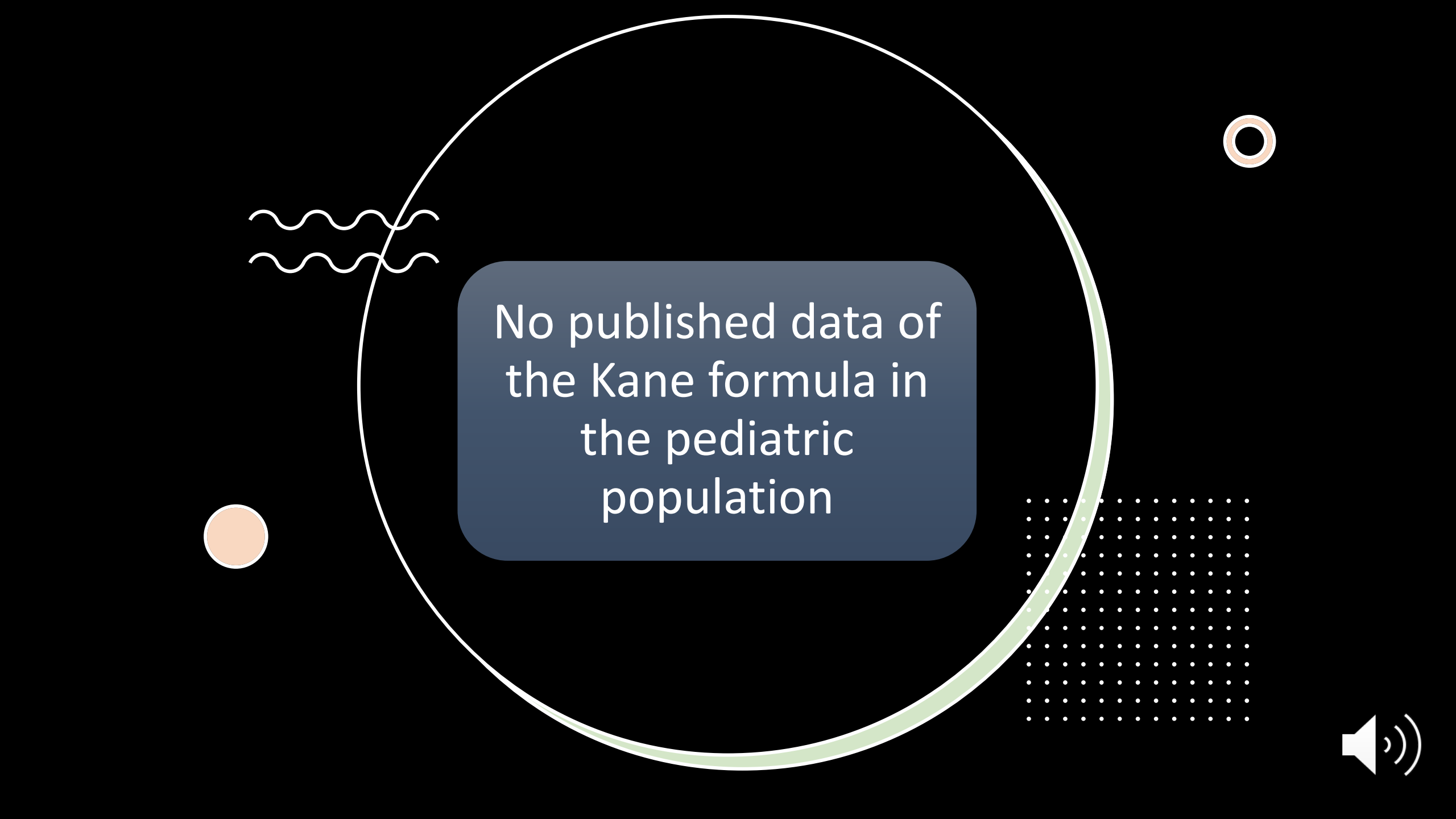
Olga Reitblat <sup>1</sup>, Helena E C

> J Cataract Refract Surg. 2021 May 1;47(5):593-598. doi: 10.1097/j.jcrs.0000000000000509.

Accuracy of new-generation intraocular lens  
calculation formulas in eyes undergoing combined  
silicone oil removal and cataract surgery

Jiaqing Zhang <sup>1</sup>, Wei Wang, Zhenzhen Liu, Guangyao Yang, Xiaozhang Qiu, Jingmin  
Guangming Jin, Yonghao Li, Shaochong Zhang, Xuhua Tan, Lixia Luo, Yizhi Liu





No published data of  
the Kane formula in  
the pediatric  
population



# Purpose

To assess the accuracy of the Kane formula IOL power calculation in comparison to established formulas in the pediatric age group





# Methods



Retrospective design



2012 – 2018



The Hospital for Sick Children,  
Toronto, Canada



Kids >6 months



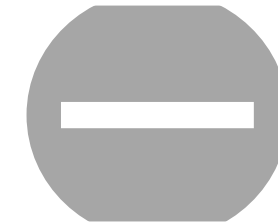
SA60AT or MA60AC IOLs



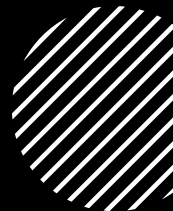
Primary in-the-bag IOL implantation

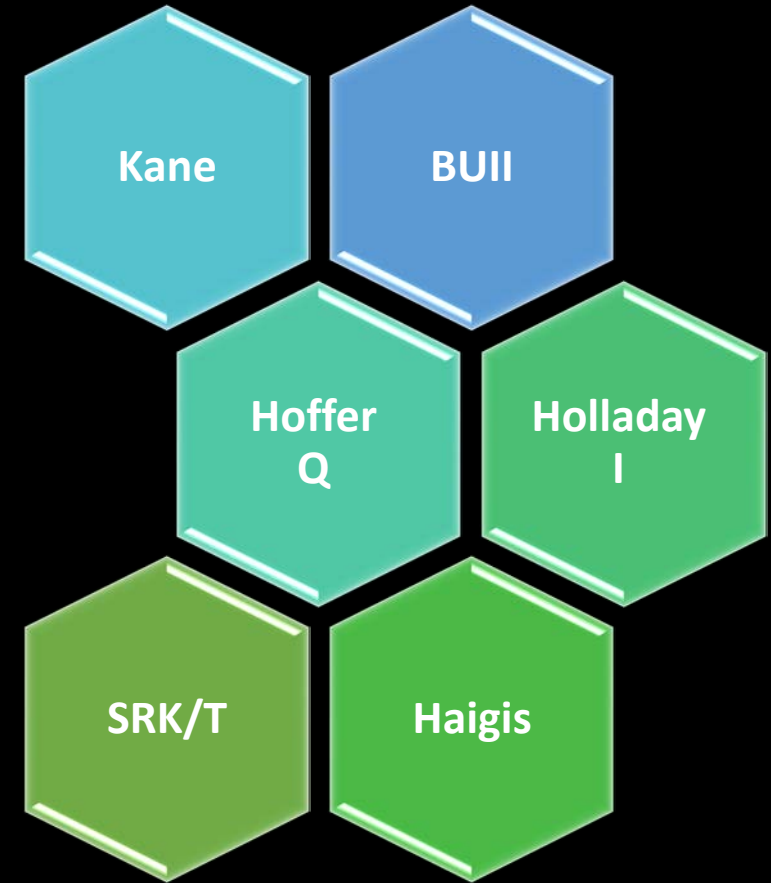
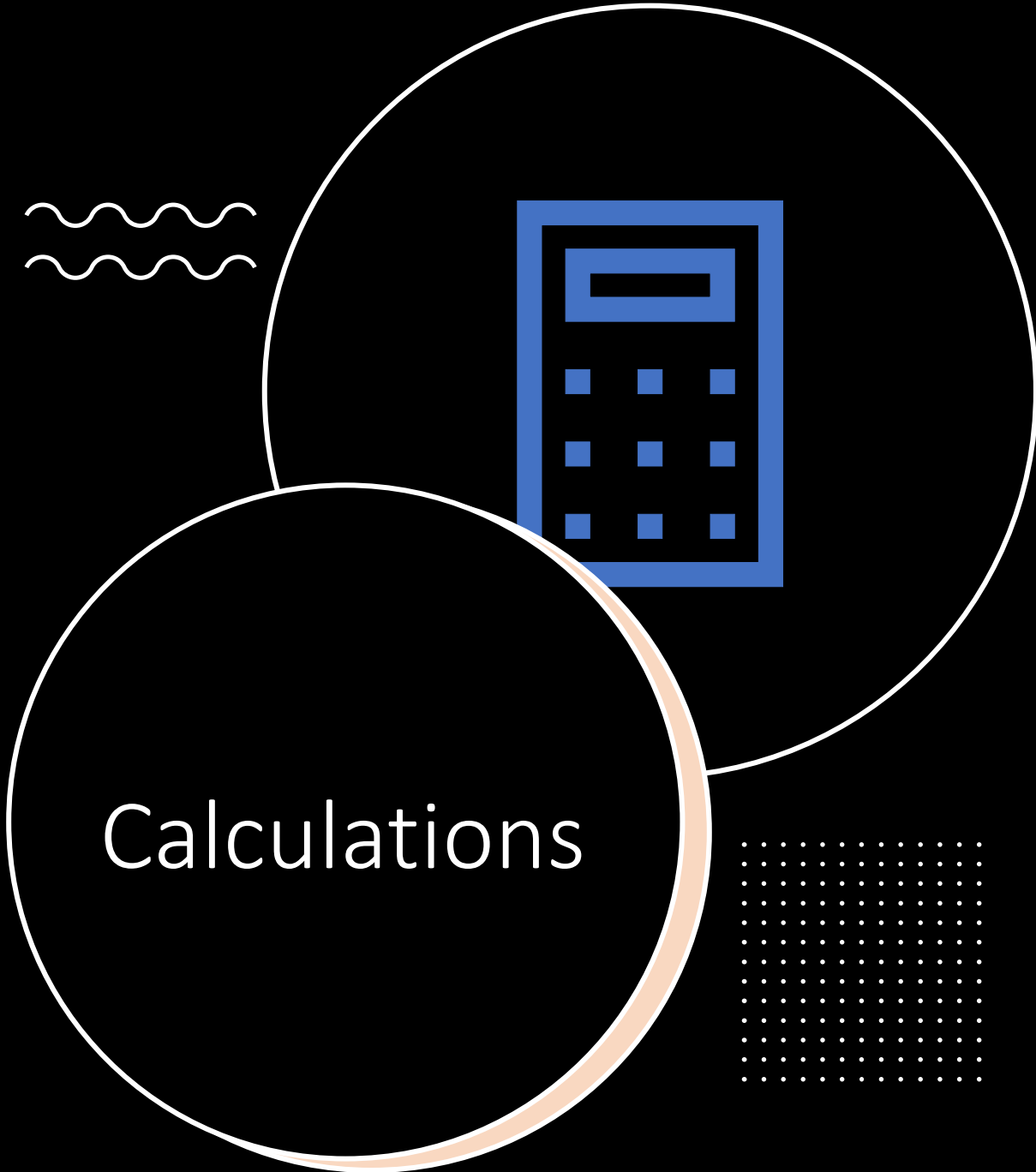


Refraction 1-3 months post-operatively



Exclusion: traumatic cataract,  
other ocular pathology,  
Persistent fetal vasculature,  
intraoperative complications





# Patients Characteristics

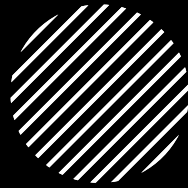
|   |                                 |
|---|---------------------------------|
| N   | 62 eyes / 62 children           |
| Male                                      | 56.5%                           |
| RE  | 53.2%                           |
| Age (months)^                             | 74.6 [71.7, 10.7 – 210.2]       |
| AL (mm)*                                  | 22.43 ± 1.66 [19.45 – 27.81]    |
| K1 (D)*                                   | 42.86 ± 1.82 [39.37 – 46.49]    |
| K2 (D)*                                   | 44.81 ± 2.30 [40.81 – 51.75]    |
| ACD (mm)*                                 | 3.58 ± 0.44 [2.35 – 4.48]       |
| Corneal Diameter (mm)^                    | 12.00 [0.50, 10.5 – 13.5]       |
| Lens Thickness (mm)^                      | 3.41 [0.48, 1.71 – 6.52]        |
| IOL Model, <sub>n</sub> (SA60AT / MA60AC) | 39 / 23                         |
| IOL Power (D)*                            | 23.2 ± 5.1 [12.0 – 39.0]        |
| Postoperative SE Refraction (D)^          | 0.5 [2.75, (-2.625) – (+5.125)] |

\*mean ± SD [range]; ^median [IQR, range]





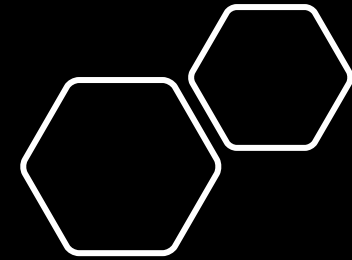
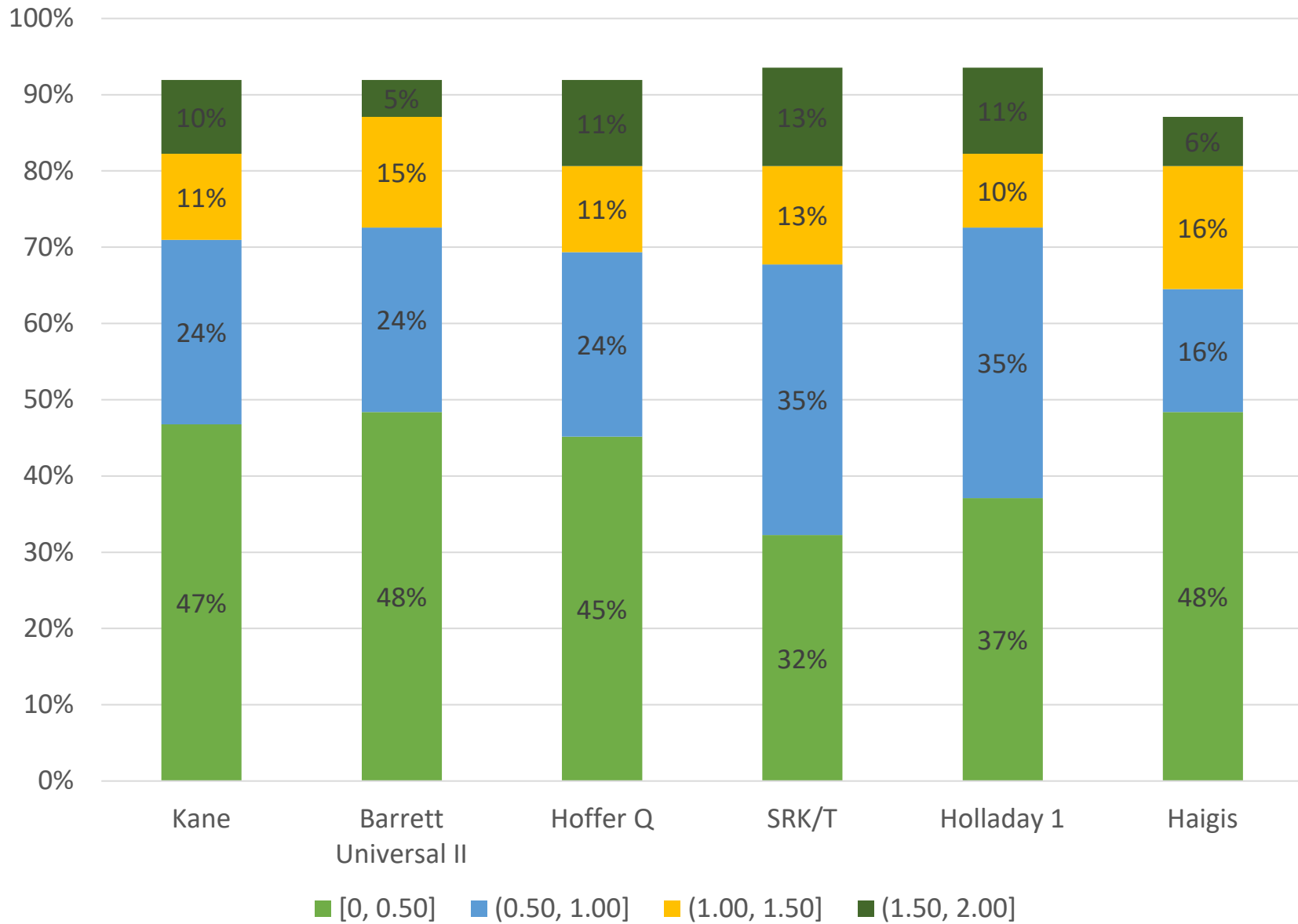
# Absolute Predicted Error



|                                 | <b>Median</b> | <b>Mean <math>\pm</math> SD</b> | <b>P-value<br/>formula vs. Kene</b> |
|---------------------------------|---------------|---------------------------------|-------------------------------------|
| <b>Kane</b>                     | 0.54          | 0.91 $\pm$ 1.04                 | -                                   |
| <b>Barrett<br/>Universal II</b> | 0.51          | 0.90 $\pm$ 1.02                 | 0.697                               |
| <b>Hoffer Q</b>                 | 0.52          | 0.89 $\pm$ 1.04                 | 0.766                               |
| <b>Holladay I</b>               | 0.58          | 0.94 $\pm$ 1.04                 | 0.285                               |
| <b>SRK/T</b>                    | 0.71          | 0.98 $\pm$ 0.99                 | 0.089                               |
| <b>Haigis</b>                   | 0.51          | 0.98 $\pm$ 1.12                 | 0.164                               |

\*Formulas optimized as described in the JCRS editorial by Wang et al.







# Conclusions



First study to evaluate the Kane formula in pediatric cataract surgery

Comparable results to previous formulas

Tendency to outperform the SRK/T formula





Thank you for  
your  
attention

