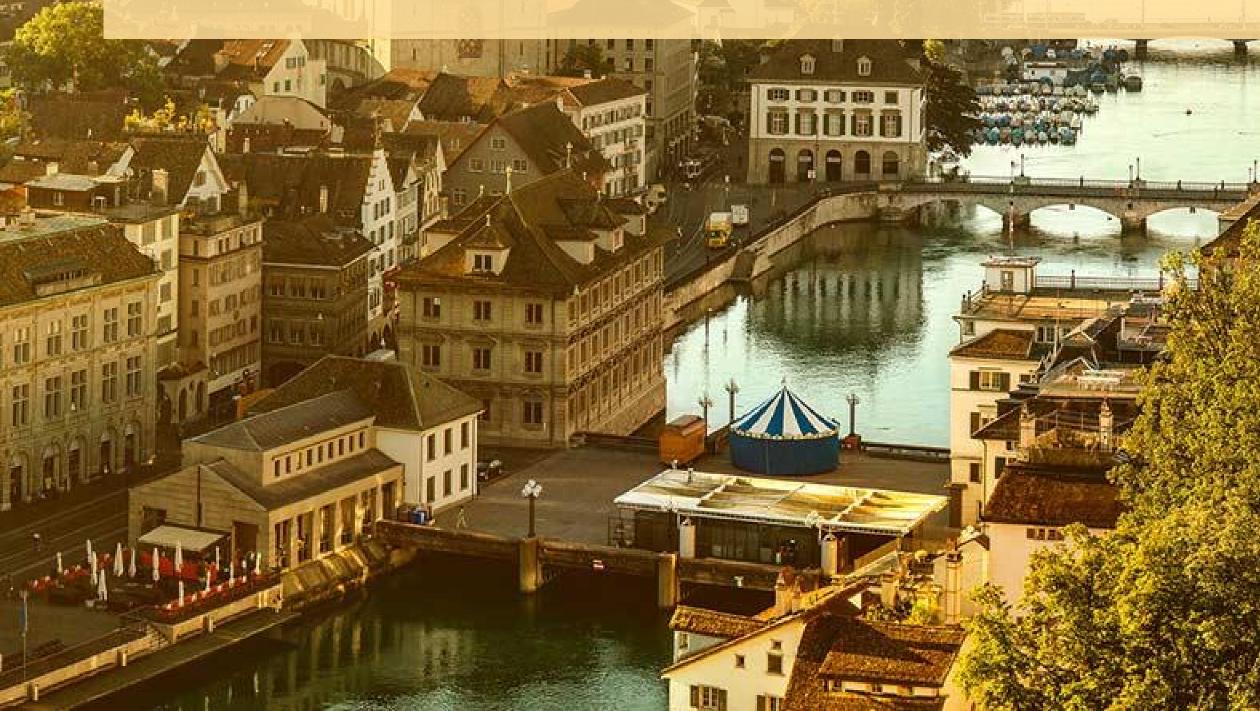
### Confidence intervals for progression after Cross-linking using the ABCD Progression Display

#### **Emilio Torres-Netto**

Michael Belin, Mark Borgstrom, Francesca Gilardoni, Hormoz Abdshahzadeh, Joerg Iwanczuk, Nikki Hafezi, Farhad Hafezi









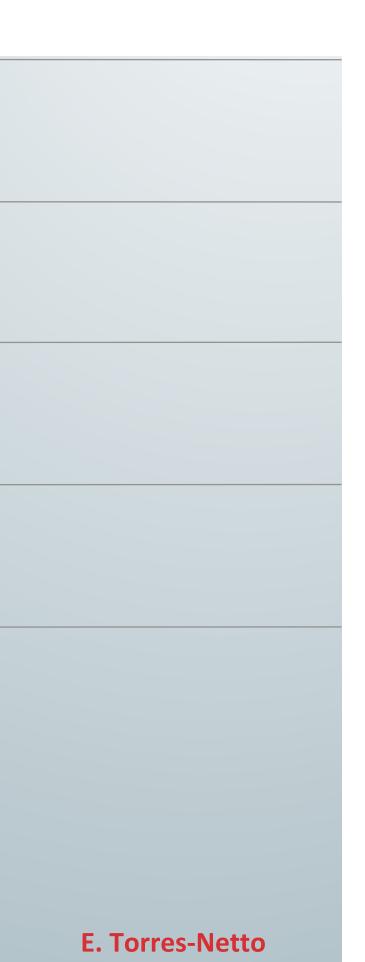


**Financial Disclosure:** Dr. Torres-Netto has received the International Council of Ophthalmology Award support. Dr. Belin serves as a consultant to Oculus GmbH and does not obtain royalties for any of the Pentacam displays. Dr. Hafazi receives non-monetary benefits from a company producing, developing or supplying the product or procedure presented. Mr Iwanczuk is employed by a company with an interest in the subject of the presentation. The other authors have no financial interest to disclose?



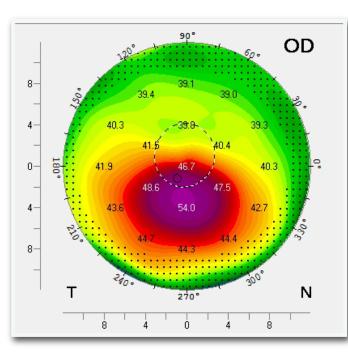


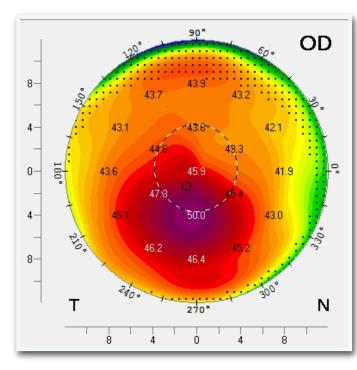
### 1. Background

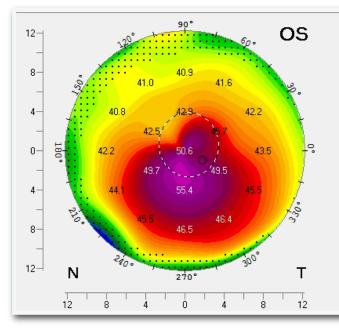


## **Determining progression (after CXL)**

(A)

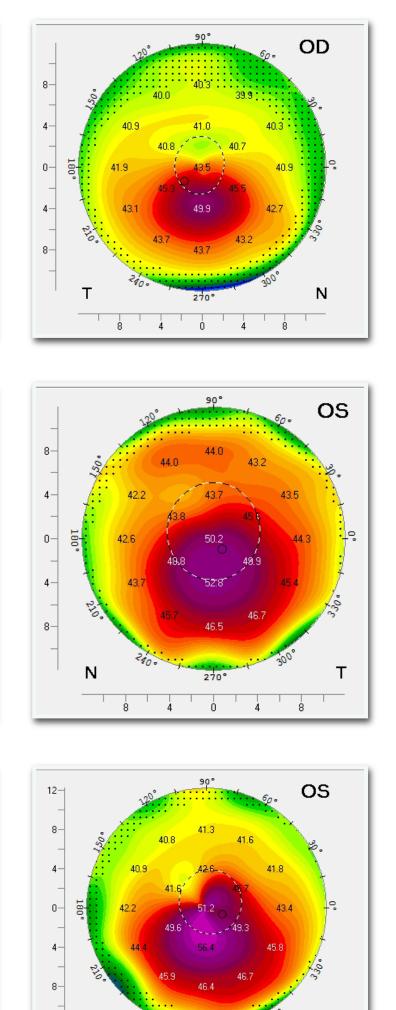




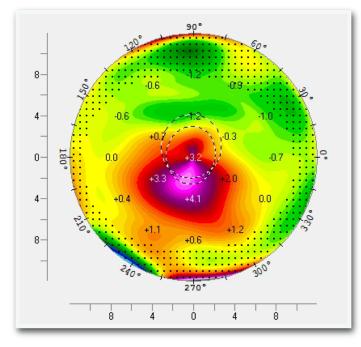


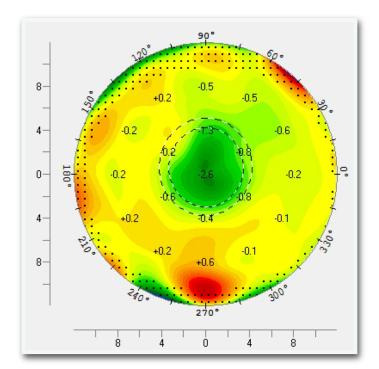
**(**B**)** 

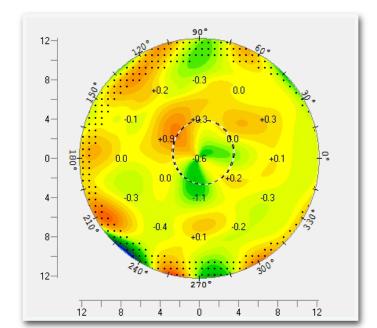
Diff. (A-B)



12 8 4 0 4 8 12







### Progressive KC

Flattening after CXL

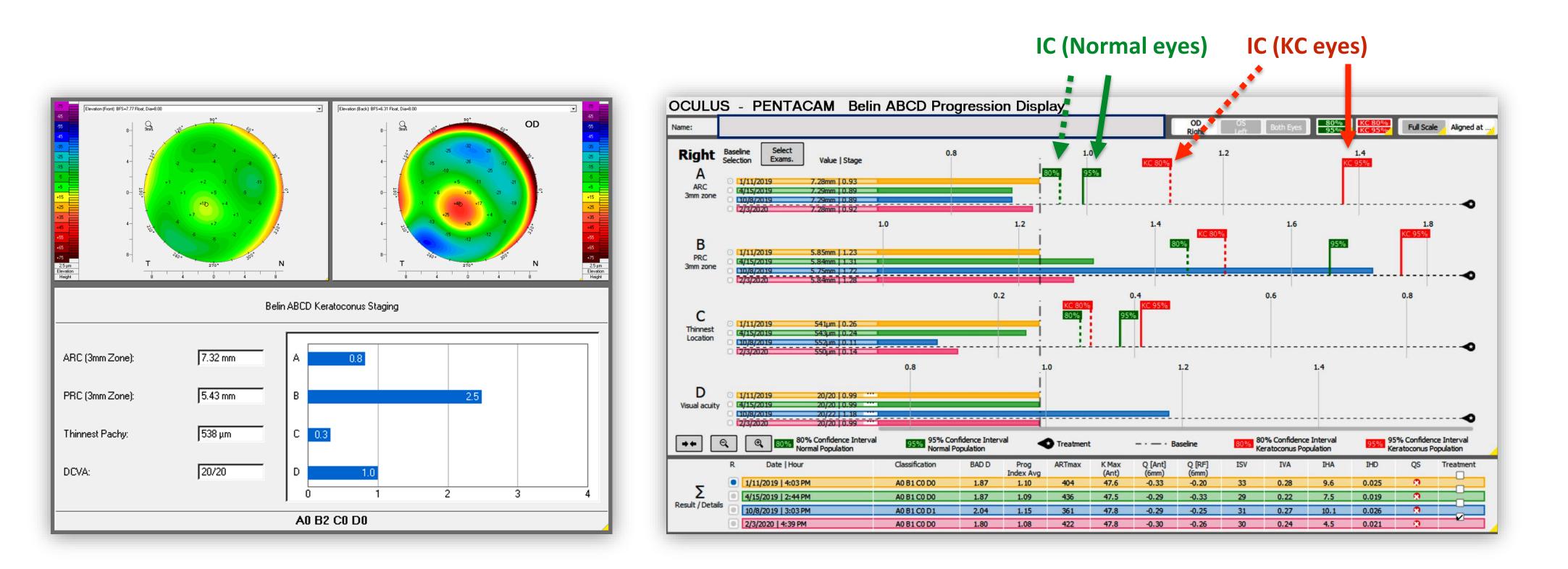
After CXL. Stable ?







#### 2. Purpose



Purpose

# **ABCD Progression display**

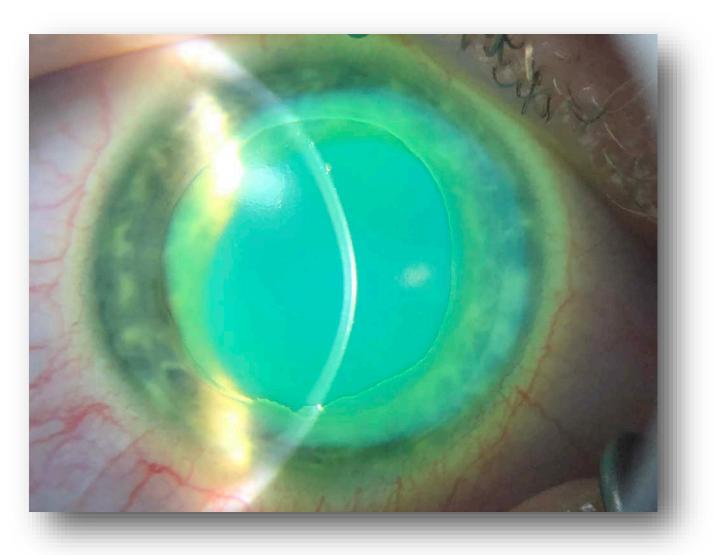
- As measurement noise post-CXL was not previously determined,
- the current study was designed to measure noise of post-CXL eyes and evaluate
- whether these measurements can serve as progression determinants after CXL.





#### 3. Methods





### **CXL for progressive Keratoconus**

**E. Torres-Netto** 

# **Measuring noise post-CXL**





### **Scheimpflug measurements**

(Pentacam, Oculus GmbH)

3 separate measurements with acceptable quality check, removing patient from device between each measurement

#### **Pooled variance estimates and one-sided confidence intervals were calculated**

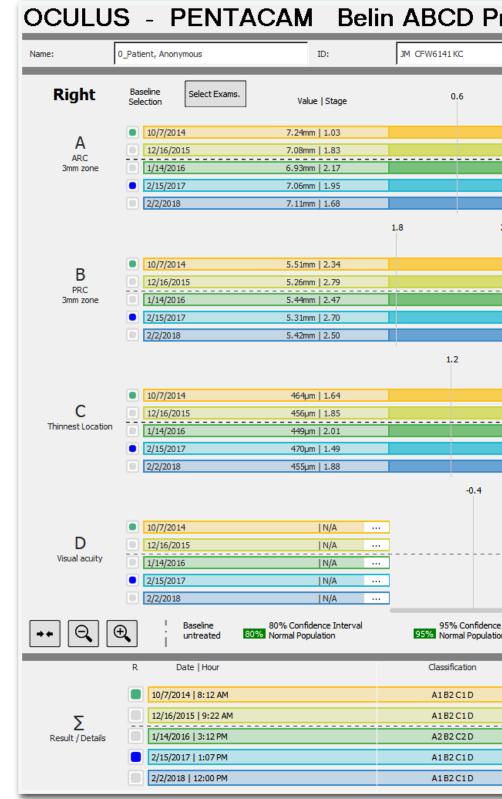






### **Confidence intervals (CI) after CXL**

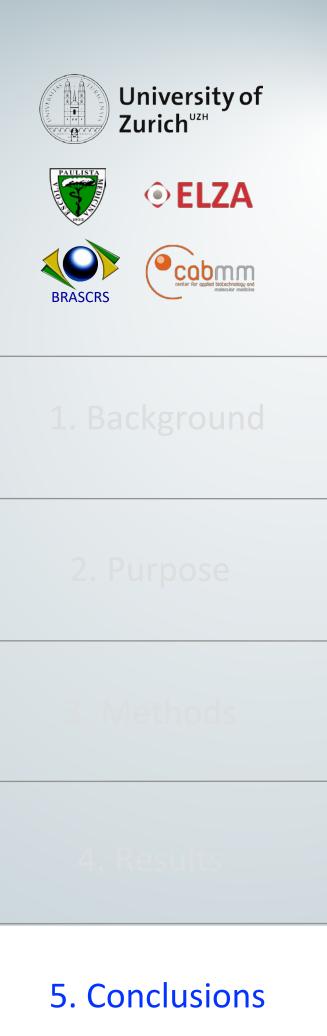
41 eyes, 41 patients		80% one-sided Cl	95% one-sided Cl
Age (avg): 32.9 years-old	Post CXL "A" parameter	0.170	0.261
Follow-up (avg): 13.5 months	Post CXL "B" parameter	0.136	0.208
BAD-D (avg): 9.26 ± 4.37	Post CXL "C" parameter	4.5	6.9
OCULUS - PENTACAM Belin ABCD Progression Display			
Name: 0_Patient, Anonymous ID:	IN ABCD Progression Display   JM CFW6141 KC Date of Birth: 1/17/1987	OD     OS     Both Eyes     80%     KC 80%       Right     Left     Both Eyes     95%     KC 95%	1.22b0 Full Sca Aligned at Baseline
Right Baseline Selection Select Exams. Value   Stage	0.6 0.8 1.0 1.2	1.4 1.6 1.8 2.0 KC 95%	2.2
A ARC 3mm zone 10/7/2014 7.24mm   1.03 12/16/2015 7.08mm   1.83 1/14/2016 6.93mm   2.17 2/15/2017 7.06mm   1.95			
B PRC 3mm zone 10/7/2014 10/7/2014 5.51mm   2.34 12/16/2015 5.26mm   2.79 1/14/2016 5.44mm   2.47 2/15/2017 5.31mm   2.70 2/2/2018 5.42mm   2.50	1.8   2.0   2.2   2.4   2.6     KC 95%   95%   95%   95%   95%     1 <td< th=""><th></th><th>80% 95% 3.4 3.6</th></td<>		80% 95% 3.4 3.6
Image: C   Image: 10/7/2014   464µm   1.64     Image: I		2.0 2.2 2.4 2.6	2.8
D Visual acuity 1/14/2015   N/A 2/15/2017   N/A 2/2/2018   N/A			1.2
Image: Construction of the section of the secting section of the section of the section of the			
R Date   Hour	Classification BAD D Prog Index Avg ARTmax K Max (Ant)   A1B2 C1D 5.61 1.71 150 48.9	(6mm) (6mm)	11D QS CXL Treatment
Image: Second state     Image: Image	A2 B2 C2 D 6.19 1.59 160 52.4	-0.69 -0.50 76 0.90 36.4 0	.121
2/15/2017   1:07 PM 2/2/2018   12:00 PM	A1B2C1D     6.70     1.81     159     50.4       A1B2C1D     6.47     1.75     150     50.3		



#### **E. Torres-Netto**









- consistent results in stabilising such progressive conditions.
- CXL procedure is performed.
- post-CXL corneas.

## **Final messages**

• Corneal cross-linking (CXL) has a major role on the treatment of ectatic diseases and has

• Less is known about the tomographic changes after CXL and what could be considered documentation of progression with the possibility of a re-treatment.

Currently, no confidence intervals are shown on the ABCD progression display once a

Our data creates the confidence intervals for corneas after CXL, and are planned for incorporation in the next generation of the display, allowing analysis of both the pre- and

# **THANK YOU**

