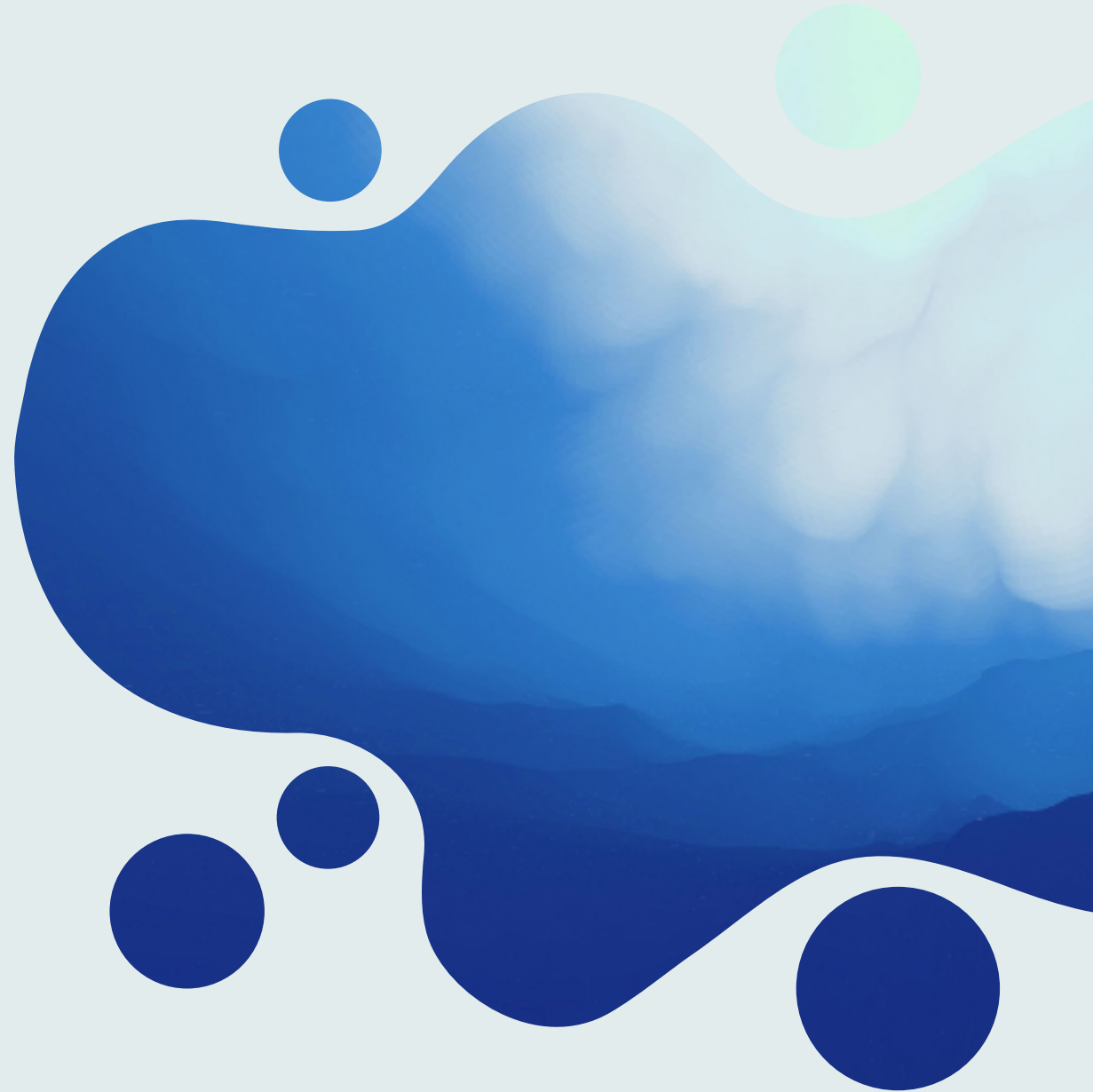


Is this keratoconus progressing?

Mohamed Hosny, MD, FRCOPhth, FRCSEd
Professor of Ophthalmology
Cairo University



An important
question....

For cases with

Forme Fruste
KC

Documented
KC with:

-K readings
up to 55D

-BCVA better
than 0.5



To decide between
immediate CXL and
Follow up.

Current main stream evidence

NO UNIFIED SENTIMENT



Classically

**Increase in Kmax 1.5D
or more**

**Decrease in CCT more
than 20 microns.**

**Increase in BAD of more
than 0.42.**

But is this the common consensus?



that was not detected with Kmax. CONCLUSIONS Our study showed a significant, but moderate, correlation between the change in Kmax and the change in A and B values in progressive KC.

Moreover, more than half of the cases showed documented progression earlier with the ABCD progression display than detected by standard Kmax changes. This study suggests possible



Permissions

MD

[Author Information](#) ☺

Using a single criterion (e.g., $\Delta K_{MAX} > 1D$) led to high values of R_{PROG} . When combining two, (K_{MAX} and A_F) led to worse C_{POP} and higher variability than (K_{MAX} and P_{MIN}); alternative criteria such as (K_{2F} and R_{mB}) obtained the best C_{POP} and the lowest variability ($P < 0.0001$). ABC, as defined by its authors, obtained R_{PROG} of 74.2%. Using wider 95% confidence intervals (95% CIs) and requiring two parameters over 95CI reduced R_{PROG} to 27.9%.

**Antwerp University Redcake
study group**

1. Steepening of the anterior corneal surface
2. Steepening of the posterior corneal surface
3. Thinning and/or an increase in the rate of corneal thickness change from the periphery to the thinnest point.”

VA is not important?? VERTICAL COMA

???

The changes need to be consistent over time and above the normal variability (ie, noise) of the measurement system (this will vary by system). Although progression is often accompanied by a decrease in best spectacle-corrected visual acuity (BSCVA), a change in both uncorrected visual acuity and BSCVA is not required to document progression.

Author Information ☺

Definition of Ectasia Progression

Currently, there is no consistent or clear definition of ectasia progression.



Aknowledging the value of VERTICAL COMA in monitoring progression

CLINICAL SCIENCE

Development of a Reference Model for Keratoconus Progression Prediction Based on Characterization of the Course of Nonsurgically Treated Cases

Martínez-Abad, Antonio MSc^{*,†}; Piñero, David P. PhD[†]; Chorro, Elizabeth PhD[‡]; Bataille, Laurent MSc^{*}; Alió, Jorge L. MD, PhD^{*,‡}

Author Information 

Cornea 37(12):p 1497-1505, December 2018. | DOI: 10.1097/ICO.0000000000001673

”

Cite



Share



Favorites



Permissions

BUY

 Metrics

The HUC progression score: A new method for determining KERATOCONUS progression

Beatriz de Luis Eguileor¹ , Borja Santos Zorrozuá²
and Jaime Etxebarria Ecenarro¹ 

European Journal of
2024, Vol. 34(4) 9
© The Author(s)



Article reuse guide
sagepub.com/journals
DOI: 10.1177/112
journals.sagepub.com



HUC score, Grading of KC

01

Grade 1 with
posterior elevation
up to 40 microns.

02

Grade 2 with
posterior elevation
41-75 microns.

03

Grade 3 more
than 75 microns.

	Grade 1	Grade 2	Grade 3	score
K max (D)	0.81	1.19	1.42	2,5
TCT (μm)	15.00	13.73	17.15	2,5
Max_BFS_post (8) (μm)	7.99	10.39	12.45	2
Z_3^{-1} (6) (μm)	0.19	0.25	0.56	2
HOA RMS (6) (μm)	0.20	0.30	0.39	1

A value greater than or equal to 6 indicates progression.

Maximum keratometry (Kmax), Maximum posterior elevation (max_BFS_post), Thinnest corneal thickness (TCT), Root mean square of high order aberrations (RMS HOA), Z_3^{-1} (vertical coma).

ARTICLE

Correlation of the Corvis Biomechanical Factor with tomographic parameters in keratoconus



Elias Flockerzi, MD, Riccardo Vinciguerra, MD, Michael Wellington Belin, MD, Paolo Vinciguerra, MD, Renato Ambrósio Jr, MD, PhD, Berthold Seitz, MD

Purpose: To investigate the relationship between corneal biomechanics and keratoconus (KC) severity as described by tomographic parameters.

Setting: University-based German ophthalmology department.

Design: Retrospective cross-sectional study.

Methods: A total of 448 KC corneas of the Homburg Keratoconus Center and 112 healthy corneas (448+112 patients) were examined by Pentacam high-resolution and Corneal Visualization Scheimpflug Technology (Pentacam HR and Corvis ST). The KC population included a wide spectrum of disease severity based on Belin's ABCD classification. Linear regression analysis was performed between the linear term of the Corvis Biomechanical Index (CBI) (CBI beta) and the tomographic values anterior radius of curvature (ARC), posterior radius of curvature (PRC), and thinnest corneal thickness (TCT). A linear transformation of the CBI beta was performed to provide an intuitive scaling, which was referred

to as the Corvis Biomechanical Factor (CBI_F = $-0.24294226 \times \text{CBI beta} + 6.02$). This scaling adjusted the CBI beta to the same scale as posterior corneal curvature (PRC).

Results: There was a high correlation of the CBI beta and its modification, the CBI_F, with TCT (Pearson, $r = -0.775$), ARC ($r = -0.835$), and PRC ($r = -0.839$) in the KC population ($P < .001$). In the control corneas, the correlation between the CBI beta and ARC was weak ($r = -0.216$, $P = .022$), not significant (PRC, $r = -0.146$, $P = .125$), or moderate (TCT, $r = -0.628$, $P < .001$).

Conclusions: The linear term of the CBI was highly associated with KC severity as defined by corneal tomography. The CBI_F represents a new scale based on biomechanical characteristics in KC, which could serve as a basis for a biomechanical KC classification in the future.

J Cataract Refract Surg 2022; 48:215–221 Copyright © 2021 Published by Wolters Kluwer on behalf of ASCRS and ESCRS

Combined biomechanical and tomographic keratoconus staging: Adding a biomechanical parameter to the ABCD keratoconus staging system

Elias Flockerzi,¹  Riccardo Vinciguerra,^{2,3} Michael Wellington Belin,⁴ Paolo Vinciguerra,^{5,6} Renato Ambrósio Jr⁷ and Berthold Seitz¹

¹Department of Ophthalmology, Saarland University Medical Center, Homburg, Germany

²Humanitas San Pio X Hospital, Milan, Italy

³School of Engineering, University of Liverpool, Liverpool, UK

⁴Department of Ophthalmology & Vision Science, University of Arizona, Tucson, Arizona, USA

⁵Department of Biomedical Sciences, Humanitas University, Milan, Italy

⁶Humanitas Clinical and Research Center – IRCCS, Rozzano, Italy

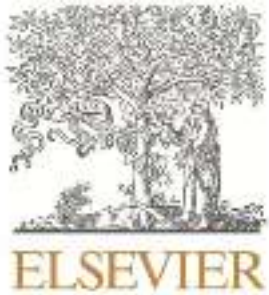
⁷Department of Ophthalmology, Federal University of the State of Rio de Janeiro, Rio de Janeiro, Brazil

than “E” or “A” in every KC [40]. The resulting BEST is meant to be an addition to the tomographic ABCD KC staging system that was published previously as it supplements biomechanical severity information for keratectasia. This recently introduced biomechanical staging

Elias Flockerzi^{1*}  and Berthold Seitz¹

Eye and Vision, 2024

Abstract
Until recently, corneal topography has been the gold standard in detecting keratectasia and monitoring its progression. The recently introduced ABCD tomographic keratoconus staging system focuses on anterior (“A”) and posterior (“B”) radius of curvature, thinnest corneal thickness (“C”), best-corrected visual acuity with spectacles (“D”) and is supplemented with the introduction of the biomechanical E-staging (BEST, “E”). The need for biomechanical staging arose from the fact of altered biomechanical characteristics of keratectasia in comparison to healthy corneas. Ectatic



Contents lists available at ScienceDirect

Intelligence-Based Medicine

journal homepage: www.sciencedirect.com/journal/intelligence-based-medicine



Stratification of keratoconus progression using unsupervised machine learning analysis of tomographic parameters

Ke Cao^{a,b}, Karin Verschoor^d, Elsie Chan^{a,b,e}, Mark Daniell^{a,b,e}, Srujana Sahebjada^{a,b,1}, Paul N. Baird^{b,*,1}

^a Centre for Eye Research Australia, Melbourne, Victoria, Australia

^b Department of Surgery, Ophthalmology, The University of Melbourne, Melbourne, Victoria, Australia

^c School of Computing Technologies, RMIT University, Melbourne, Australia

^d School of Computing and Information Systems, The University of Melbourne, Melbourne, Australia

^e Royal Victorian Eye and Ear Hospital, Melbourne, Victoria, Australia

Next Stop...AI

Conclusion

No current global consensus on the criteria of KC progression.

Relying on the Kmax alone is not reliable.

Relying on the ANTERIOR curvature PLUS PACHYMETRY changes is more accurate.

Relying on the ANTERIOR curvature PLUS POSTERIOR curvature changes is more and more accurate.

The addition of a biomechanical parameter provides more precise gauging of progression.

The need for Aligning world wide practice with the same GUIDELINES is MANDATORY.

Artificial intelligence is the only solution and is the duty of GLOBAL SOCIETIES.

BIG LOSS for REFRACTIVE SUGERY



AND.....

A GREAT GUY