Update Myopie-Management

Prävention gegen Kurzsichtigkeit

VEREINIGUNG ZÜRCHER AUGENOPTIKER

Fortbildung vom 10.11.2022

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Disclosure

Dr. Michael Bärtschi

is a paid consultant for :

HAAG-STREIT, Schweiz

FALCO Kontaktlinsen, Schweiz

COOPER Vision, UK

However:

The following impressions reflects our own decision-making process and experiences made by our entire EYENESS team, unaffected from HAAG-STREIT, FALCO or COOPER Vision.

Lernziele Myopie Management

- Kennen der Grundlagen des Myopie Managements (MM)
- Einschätzen und Anwenden können der Präventionsmaßnahmen
- Erstellen einer individuellen Risikoanalyse
- Übersicht des drei Säulen Modells erlangen
- Planung und Durchführung eines strukturierten Myopie Managements
- Updates und Anwendung von pharmazeutischen Maßnahmen insbesondere Atropin
- Updates und Anwendung von optischen Maßnahmen insbesondere Kontaktlinsen und Brillengläser
- Planung und Durchführung des Ausstiegs aus dem Myopie Management
- Fragen aus dem Plenum und Roundtable

Ophthalmology
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Myopia Prevention and Outdoor Light Intensity in a School-Based Cluster Randomized Trial

Pei-Chang Wu, MD, PhD,[1] Chueh-Tan Chen, MS,[1] Ken-Kuo Lin, MD,[2] Chi-Chin Sun, MD, PhD,[3] Chien-Neng Kuo, MD,[4] Hsiu-Mei Huang, MD,[1] Yi-Chieh Poon, MD,[1] Meng-Ling Yang, MD,[2] Chau-Yin Chen, MD,[4] Jou-Chen Huang, MD,[4] Pei-Chen Wu, MD,[4] I-Hui Yang, MD,[1] Hun-Ju Yu, MD,[1] Po-Chiung Fang, MD,[1] Chia-Ling Tsai, DDS,[5] Shu-Ti Chiou, PhD,[6,7,8,*] Yi-Hsin Yang, PhD[9,*]

„Currently, myopic maculopathy is the leading cause of blindness in Taiwan, Japan and China."

Ophthalmology, 2018

Klinische Evidenz:
Sekundär Erkrankungen als Folge hoher Myopie

REVIEW ARTICLE 2018

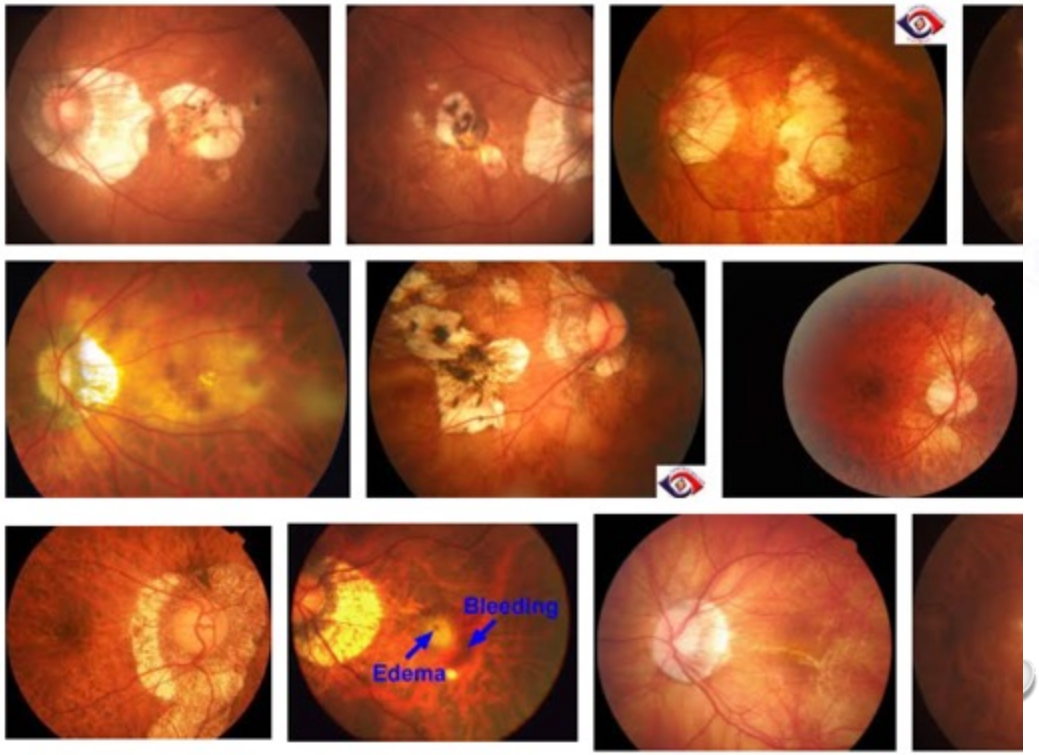
OPEN

A Review of Current Concepts of the Etiology and Treatment of Myopia

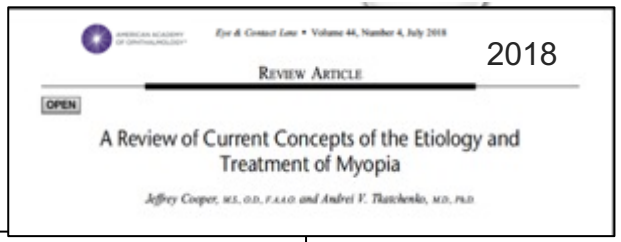
Jeffrey Cooper, M.S., O.D., F.A.A.O. and Andrei V. Tkatchenko, M.D., Ph.D.

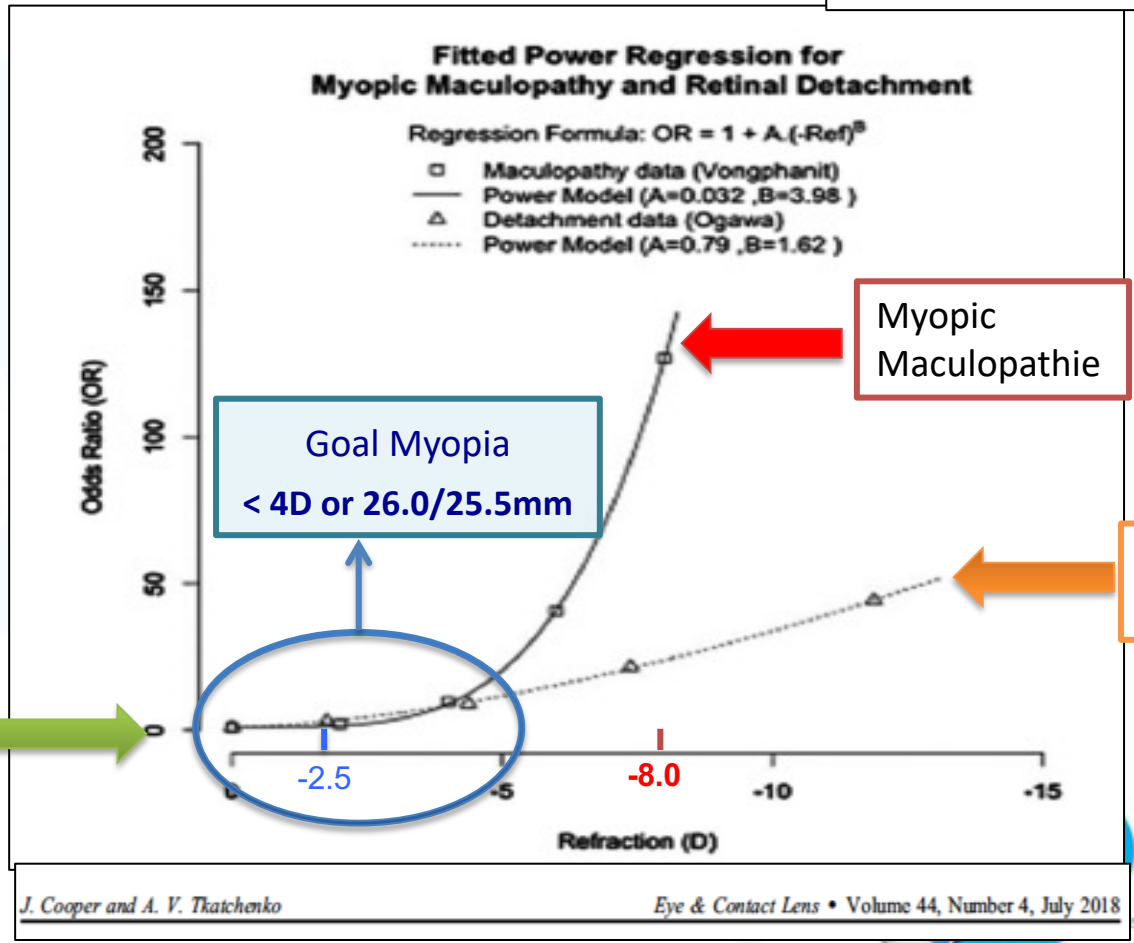
- **Myopische Makulopathie** (MM)
- **Netzhautabhebung/-ablösung**

  (Ablatio/Amotio retinae)
- Katarakt *(4x höheres Risiko)*
- Glaukom *(2x höheres Risiko)*



Risk (Odds)Ratio





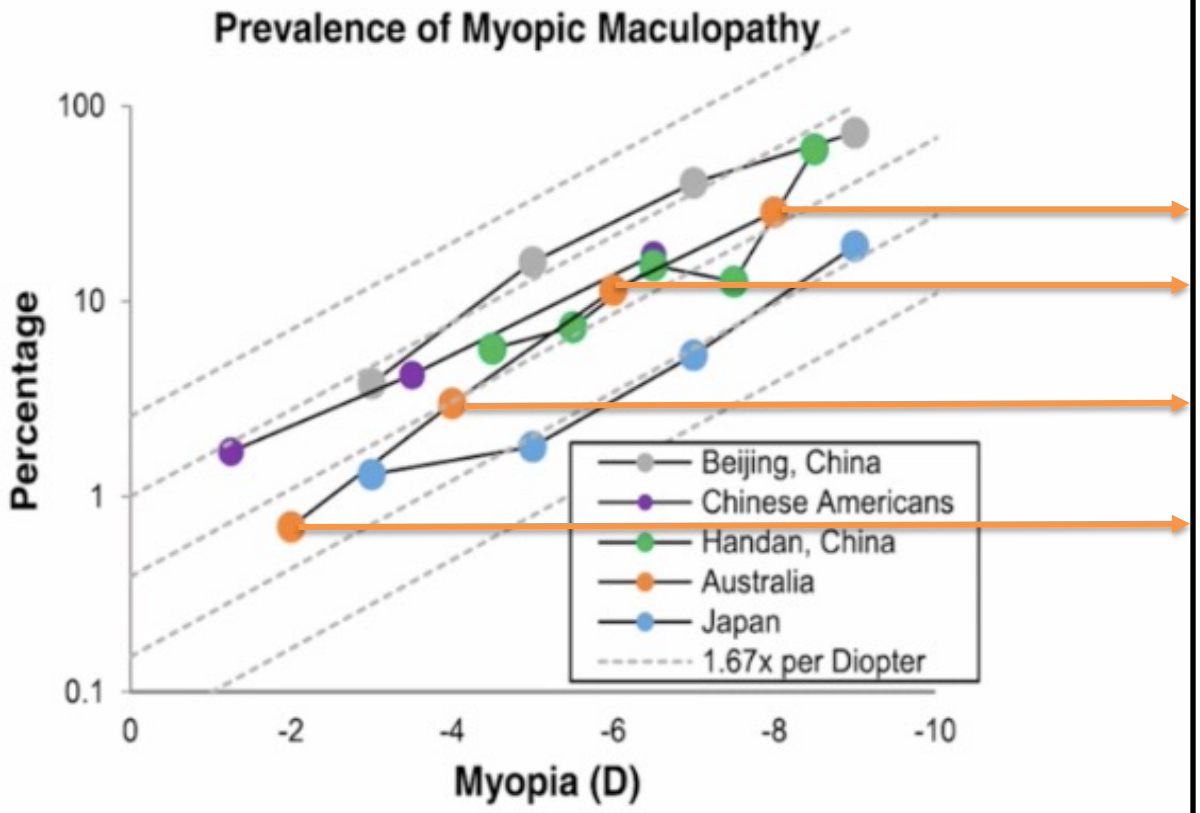
Hochmyop > 60y:

Amotio	12x
MM	845x

Haarman et al. IOVS 2020 Apr 9;61(4):49
The complications of myopia: A Review and Meta-Analysis

The Myopia Epidemic

Bullimore & Brennan et al. OptomVisSci 2019

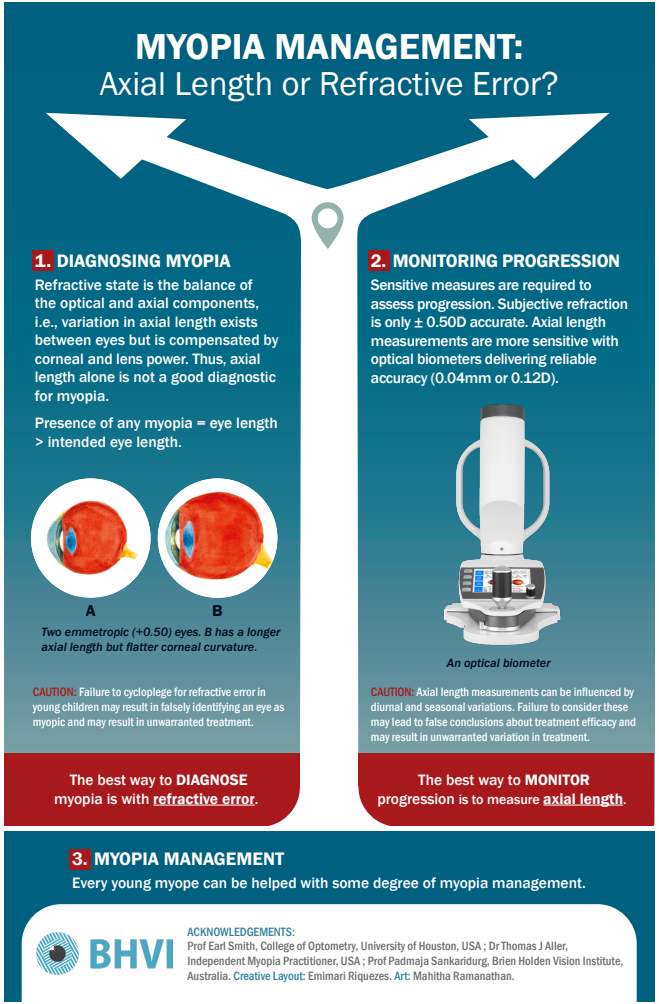


Bullimore & Brennan et al. Optom Vis Sci 2019

Global Vision Summit 2021

* Prävalenz Glaukom der Risikogruppe (alte CH Bevölkerung)

Diagnose und Nachsorge



2021

Review

EJO European Journal of Ophthalmology

Update and guidance on management of myopia. European Society of Ophthalmology in cooperation with International Myopia Institute

European Journal of Ophthalmology
1–31

DOI: 10.1177/11206721211998960
journals.sagepub.com/home/ejo
SAGE

Treatment duration

Axial length is the most important metric to monitor in pre-myopic and myopic children.[93,285,334,337,338]

Myopia generally progresses most rapidly during pre-teenager years (7–12 years), subsequently slowing through adolescence and adulthood.[67,91,354] The mean age of myopia stabilization is around 15.6 years of age, and 95% of myopes stabilize by age of 24 years.[83]

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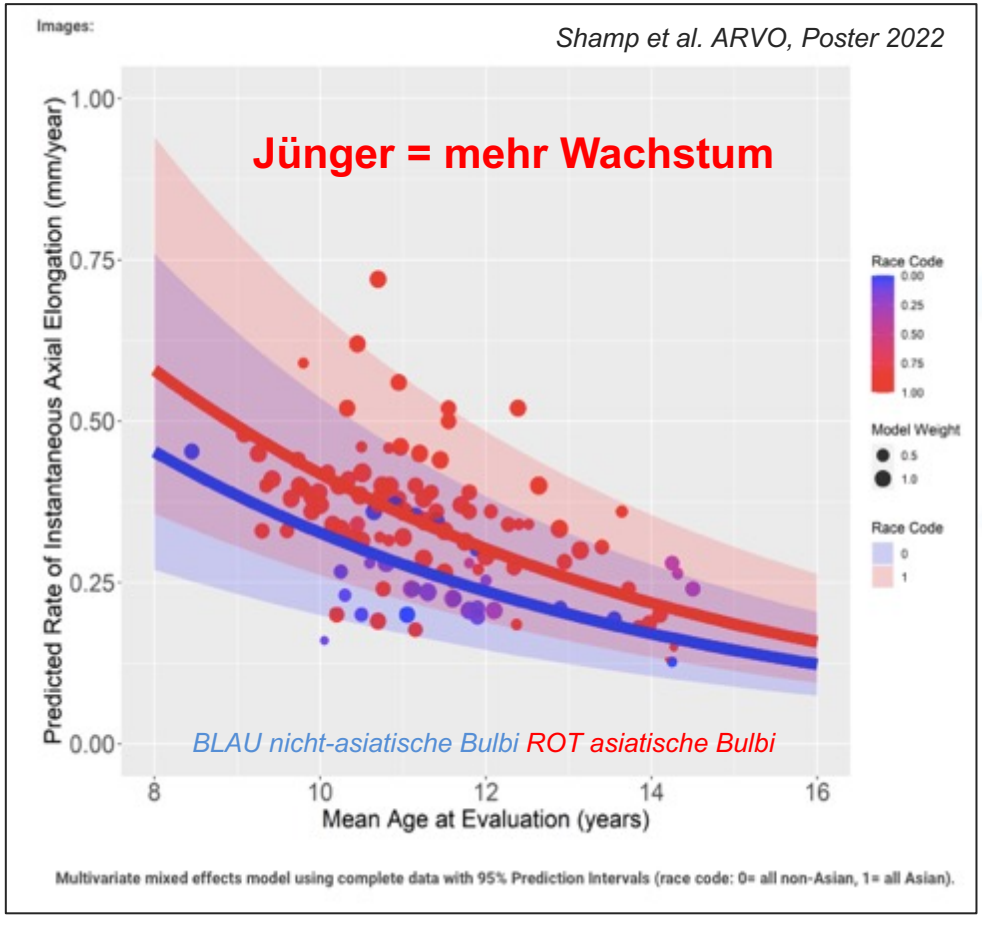
Diagnose und Nachsorge

Jährliche AXL Wachstumsrate von asiatischen und nicht-asiatischen Bulbi in Abhängigkeit vom Alter



"Faustformel" für nicht-asiatische Bulbuslängen:

- für "Emmetrope" Bulbuslänge:

< 22.5 mm Buben

< 22.0 mm Mädchen

- *Normverteilung LIFE-Studie (D) für 15-jährige:*

23.6 mm Buben

23.1 mm Mädchen

- *für "hoch-myope" Bulbuslänge:*

> 25.0 mm Buben

> 24.5 mm Mädchen

- *Pathologische Bulbuslänge:*

> 26.0 mm Buben

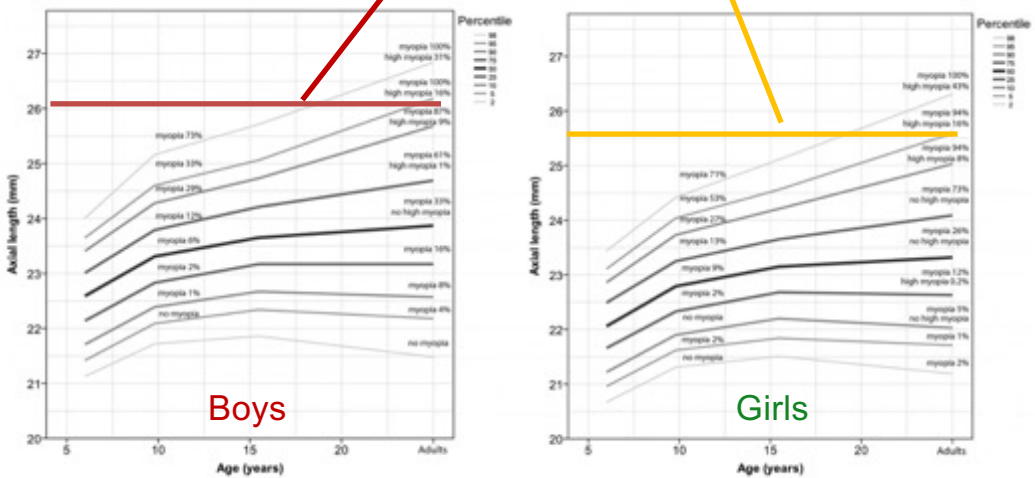
> 25.5 mm Mädchen

Diagnose und Nachsorge

OCULUS Myopia Star

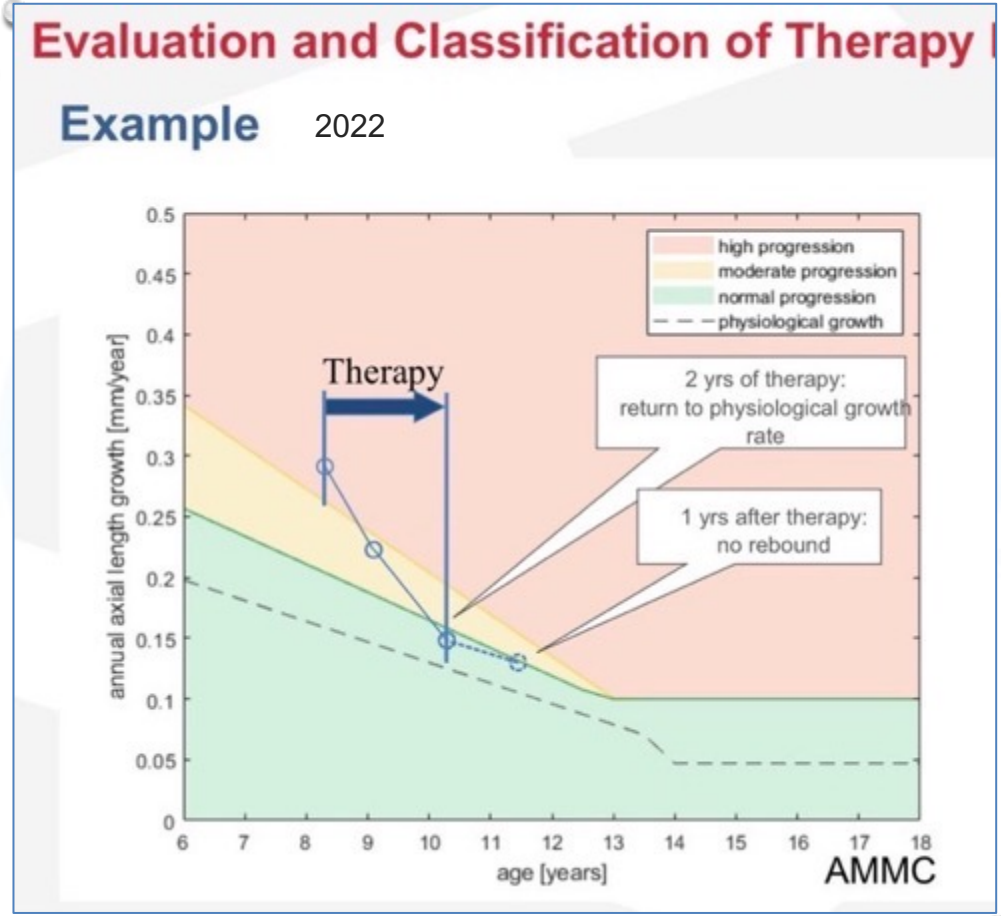
TOPCON Myah

HAAG-STREIT Lenstar Myopia



Tideman JWL, Polling JR, Vingerling JR, Jaddoe VW V., Williams C, Guggenheim JA, et al. Axial length growth and the risk of developing myopia in European children. *Acta Ophthalmol.* 2018 May;96(3):301–9.

Diagnose und Nachsorge

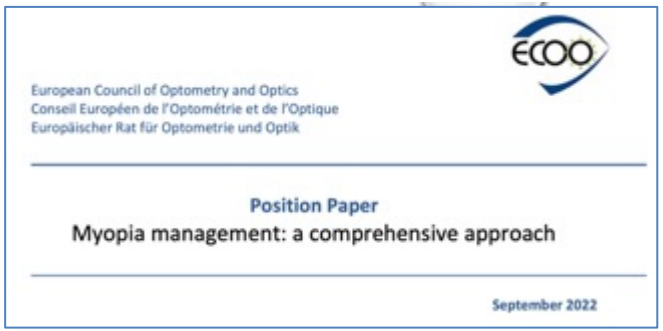


AMMC

Age Matched Myopia Control

Guidelines 2021- 22:

- IMI (International Myopia Institute)
- AAO (American Academy of Ophthalmology)
- ESO (European Society of Ophthalmology)
- ECOO (European Council Optometry & Optics)



European Council of Optometry and Optics
Conseil Européen de l'Optométrie et de l'Optique
Europäischer Rat für Optometrie und Optik

Position Paper

Myopia management: a comprehensive approach

September 2022

INTERNATIONAL MYOPIA INSTITUTE

ZUSAMMENFASSUNG ALLER KLINISCHEN

IMI Leitlinien zur Behandlung von Kurzsichtigkeit

Monica Jong PhD BOptom
Executive Director IMI
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Kate L. Gifford BAppSc(Optom) PhD
IMI Committee Chair
Private Practice and Queensland University of Technology, Australia

Review

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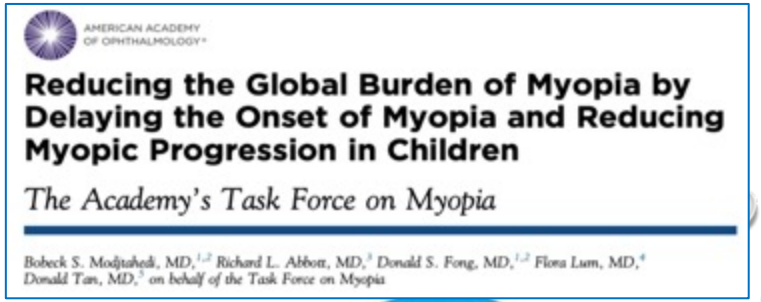

AMERICAN ACADEMY OF OPHTHALMOLOGY

Reducing the Global Burden of Myopia by Delaying the Onset of Myopia and Reducing Myopic Progression in Children

The Academy's Task Force on Myopia

Bobeck S. Modjtahedi, MD,[1,2] Richard L. Abbott, MD,[3] Donald S. Fong, MD,[1,2] Flora Lum, MD,[4] Donald Tan, MD,[5] *on behalf of the Task Force on Myopia*

AKTUELL: Drei Säulen

- Pharmazeutische Therapie (Atropin)
- Lifestyle Anpassung (Outdoor, Naharbeitsdistanz und –zeit, Licht)
- Optische Hemmung (KL und Brillen)
- Weitere Faktoren

  Binokularsehen (Nahesophorie)

  Akkommodationsschwäche

Adaptives & individuelles Management !

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Das Ziel des Myopie Management

Die **kontrollierte** Anwendung **präventiver** Maßnahmen,

zur **nachhaltigen Hemmung** des **Längenwachstums** des

Auges, zwecks **Minimierung** krankhafter **Folgeschäden.**

Definition Michael Bärtschi, 2012 (!)

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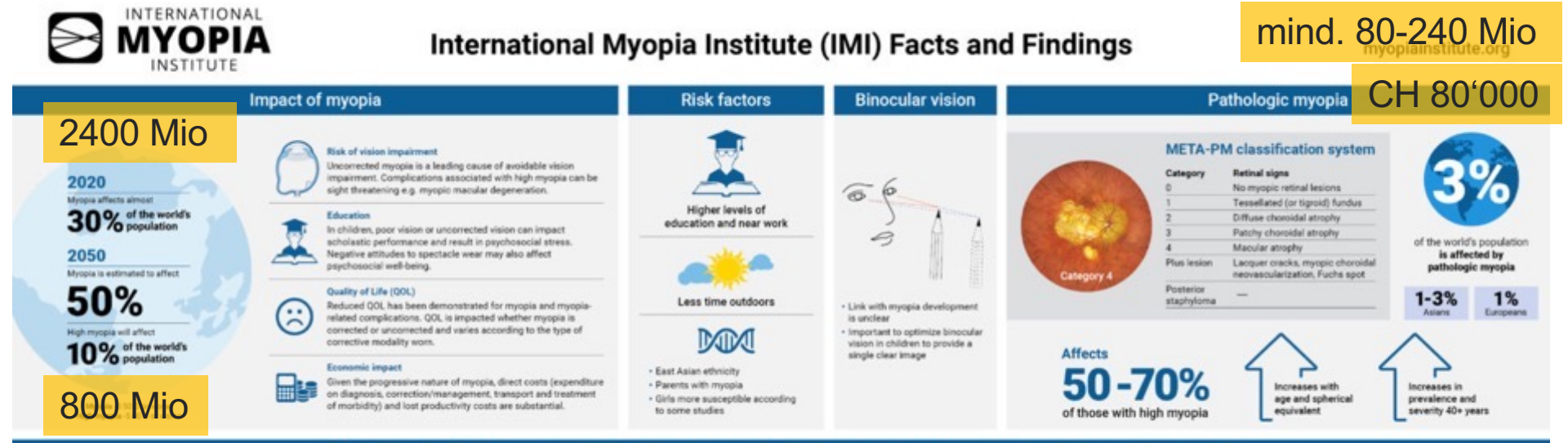
Infographik IMI publiziert 25. August 2021

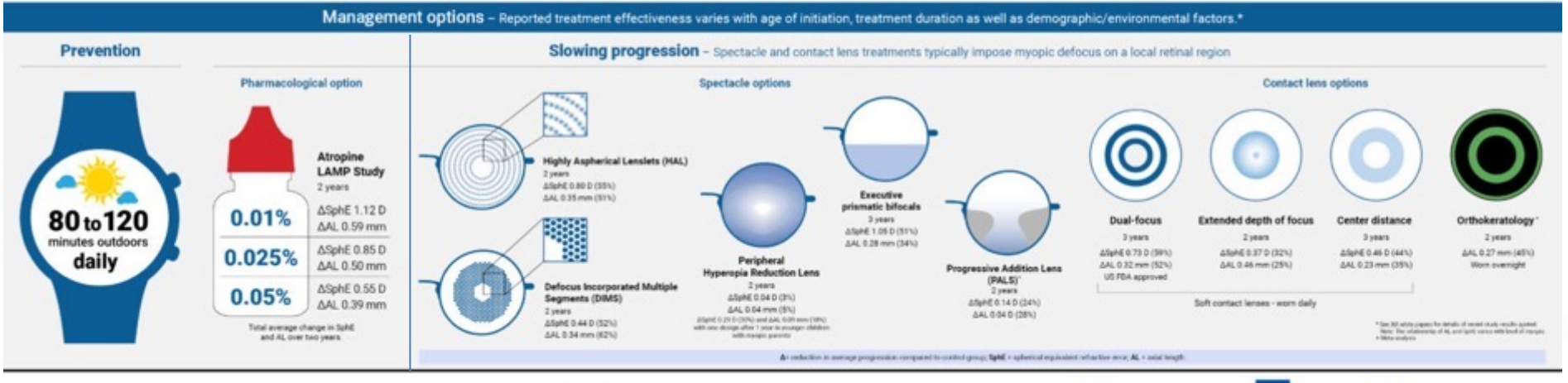
mind. 80-240 Mio

CH 80‘000

2400 Mio

800 Mio





Authors: Monica Jong, James Wolffsohn, Christine Wildsoet, Jost Jonas, Ian Morgan, Nicola Logan, Kyoko Ohno-Matsui, Padmaja Sankaridurg, Serge Resnikoff.
Source: IMI white papers 2019, 2021 https://myopiainstitute.org/imi-white-papers/ Investigative Ophthalmology & Visual Science IMI special issues 60(3) 2019 and 62(5) 2021
Images are artists impressions. International Myopia Institute © 2021
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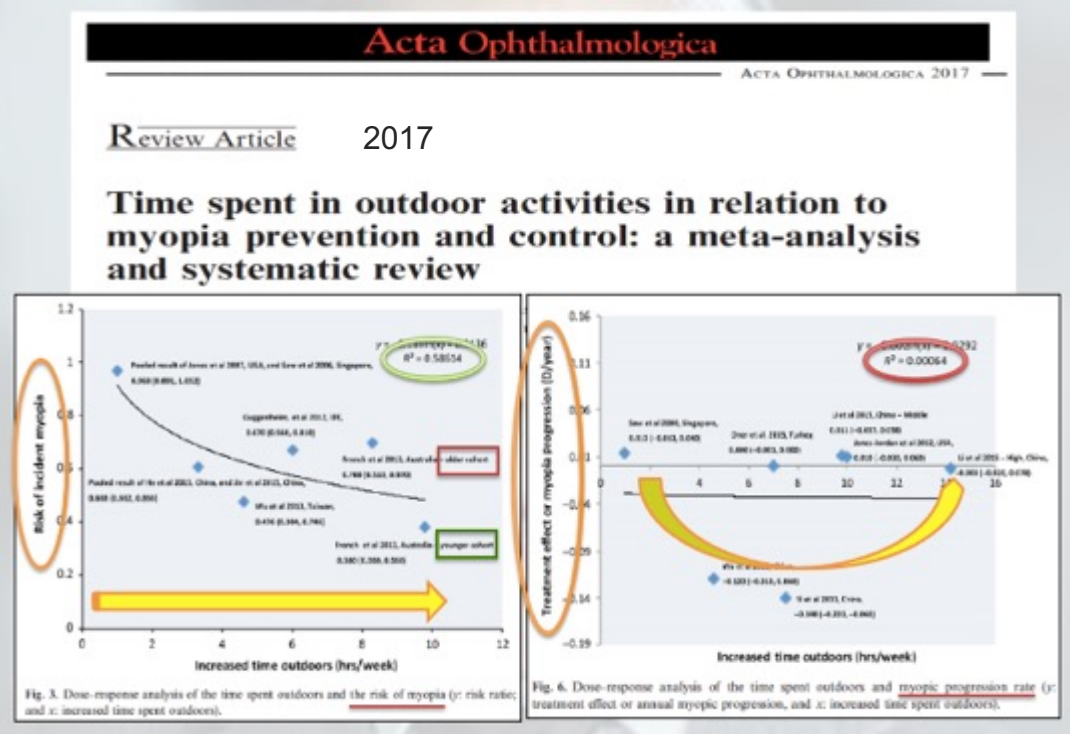
Myopie Management Prävention (Tageslicht)

Während der frühkindlichen Phase des Augenwachstums vom hyperopen zum emmetropen Auge (Emmetropisierung Phase), kann ein vermehrter Aufenthalt im hellen Freien die **Wahrscheinlichkeit** des Auftretens einer Myopie reduzieren.

Jedoch paradoxerweise kaum mehr weiter hemmen sobald das Auge bereits myop ist.

(Treatment effect on myopia progression)



Xiong et al. Time spend in outdoors activities in relation to myopia prevention and control. Acta Ophthalmologica 2017

Myopie Management Prävention (Tageslicht)

Received: 28 August 2021 | Accepted: 4 December 2021
DOI: 10.1111/opo.12945

2022

OPO THE COLLEGE OF OPTOMETRISTS

REVIEW ARTICLE
Special Issue Article

Ophthalmic Physiol Opt. 2022;00:1–14.

Time spent outdoors as an intervention for myopia prevention and control in children: an overview of systematic reviews

Rohit Dhakal[1,2] | Rakhee Shah[2] | Byki Huntjens[2] | Pavan K Verkicharla[1] | John G Lawrenson[2,*]

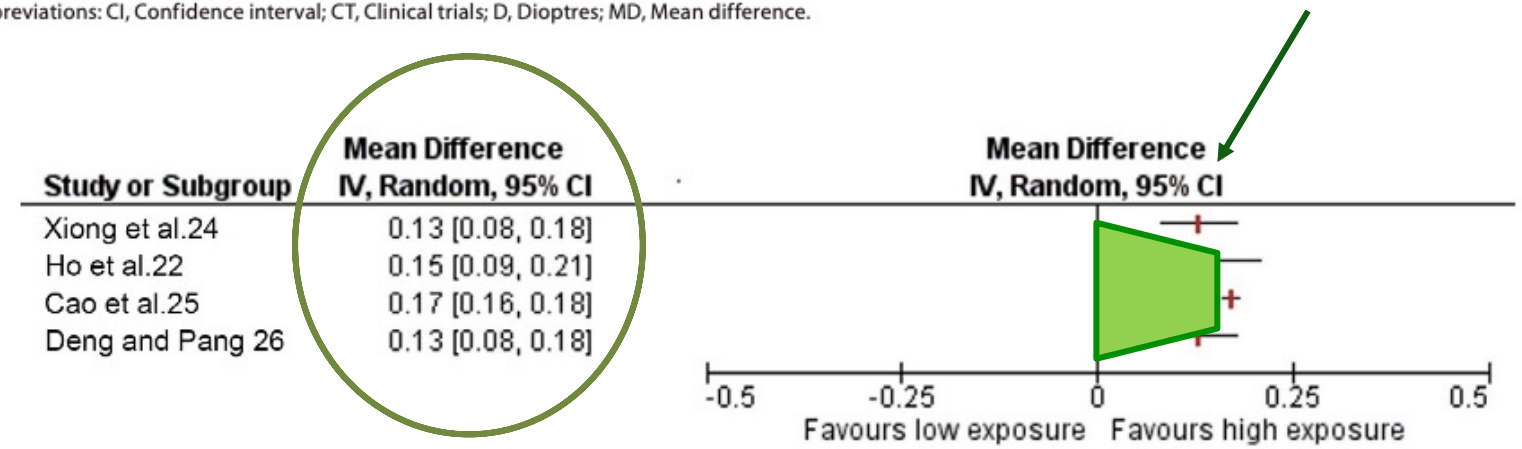
Conclusion: This overview found that increased exposure to outdoor light reduces myopia development. However, based on annual change in SER and AL, there is insufficient evidence for a clinically significant effect on myopia progression. The poor methodological quality and inconsistent reporting of the included systematic reviews reduce confidence in the estimates of effect.

Myopie Management Prävention (Tageslicht)

TABLE 5 Change in spherical equivalent refractive error reported in included systematic reviews and meta-analyses

Review study	Number of subjects (Number and design of primary studies)	Duration of effect (years)	Measure of effect (D), MD (95% CI)	Measure of effect standardised to 1 year (D) MD (95% CI)	Direction of effect
Xiong et al.[24]	2,865 (3, CT)	3	0.30 (0.18, 0.41)	0.13 (0.08, 0.18)	Favours high outdoor exposure
Ho et al.[22]	4,406 (6, CT)	1	0.15 (0.09, 0.22)	0.15 (0.09, 0.22)	Favours high outdoor exposure
Cao et al.[25]	2,729 (4, CT)	NI	0.17 (0.16, 0.18)	0.17 (0.16, 0.18)	Favours high outdoor exposure
Deng and Pang[26]	3,272 (5, CT)	1	0.13 (0.08, 0.18)	0.13 (0.08, 0.18)	Favours high outdoor exposure

Abbreviations: CI, Confidence interval; CT, Clinical trials; D, Dioptres; MD, Mean difference.



Cave Emmetropisierung: 0.75 - > 1dpt / Jahr

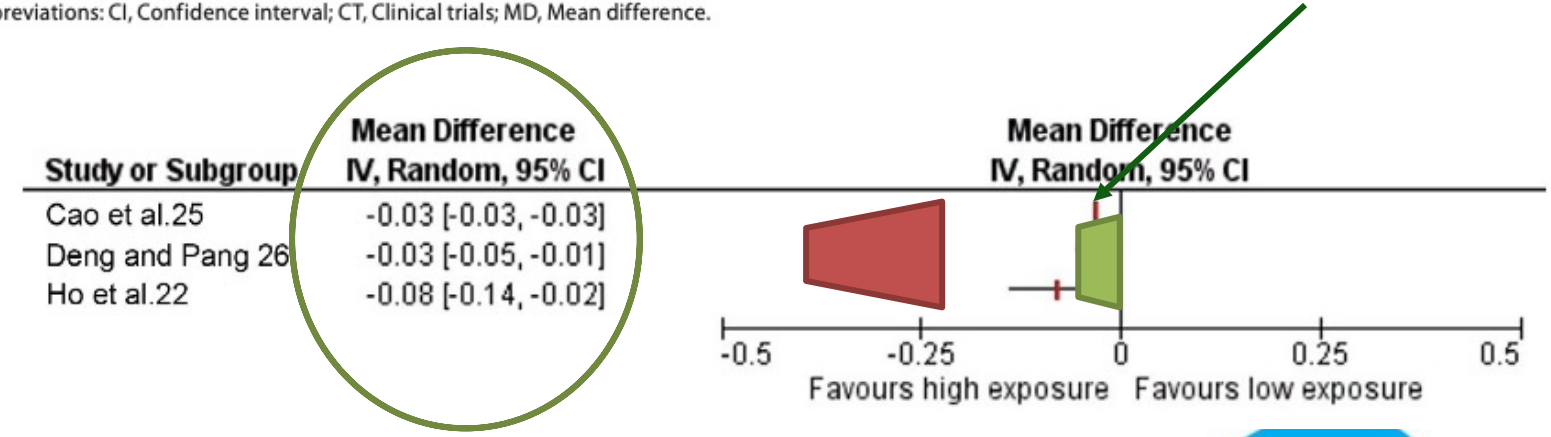
Quelle: Truckenbrod et al, LIFE, OCL Juni 2021

Myopie Management Prävention (Tageslicht)

TABLE 6 Change in axial length reported in included systematic reviews and meta-analyses

Review study	Number of subjects (Number and design of primary studies)	Duration of effect (years)	Measure of effect (mm) (95% CI)	Direction of effect
Deng and Pang[26]	2,658 (3, CT)	1	MD −0.03 (−0.05, 0.00)	Favours high outdoor exposure
Cao et al.[25]	2,658 (3, CT)	NI	MD −0.03 (−0.03, −0.03)	Favours high outdoor exposure
Ho et al.[22]	3,903 (4, CT)	1	MD −0.08 (−0.14, −0.02)	Favours high outdoor exposure

Abbreviations: CI, Confidence interval; CT, Clinical trials; MD, Mean difference.



Cave Emmetropisierung: 0.22 – 0.35mm / Jahr

Quelle: Truckenbrod et al, LIFE, OCL Juni 2021

Risiko Beurteilung "Anna"

	Low Risk	Increased Risk	High Risk
Myopia	< -2.0 dpt	-2.25 to -4.0 dpt	> -4.0 dpt
Progression/Year	-0.25 dpt	-0.5 dpt	>-0.5 dpt
Parental Myopia	none	1 parent	both
Age	> 14 years	9 - 14 years	< 9 years
Near work/Day	1 - 2 h	3 - 4 h	> 4 h
Near distance	> 30 cm	> 25 - 29 cm	< 20 - 25 cm
Outdoor time	2 h	1 - < 2 h	< 1 h
Heredity	African South-American	Caucasian	Asian
Axial lenght male	< 23 - 23.5 mm	23.5 - 24.5 mm	> 24.5 mm
female	< 22.5 - 23 mm	23 - 24 mm	> 24 mm

⇒ Kind mit hohem Risikoprofil

Prognose „Anna“

Ethnicity: Caucasian

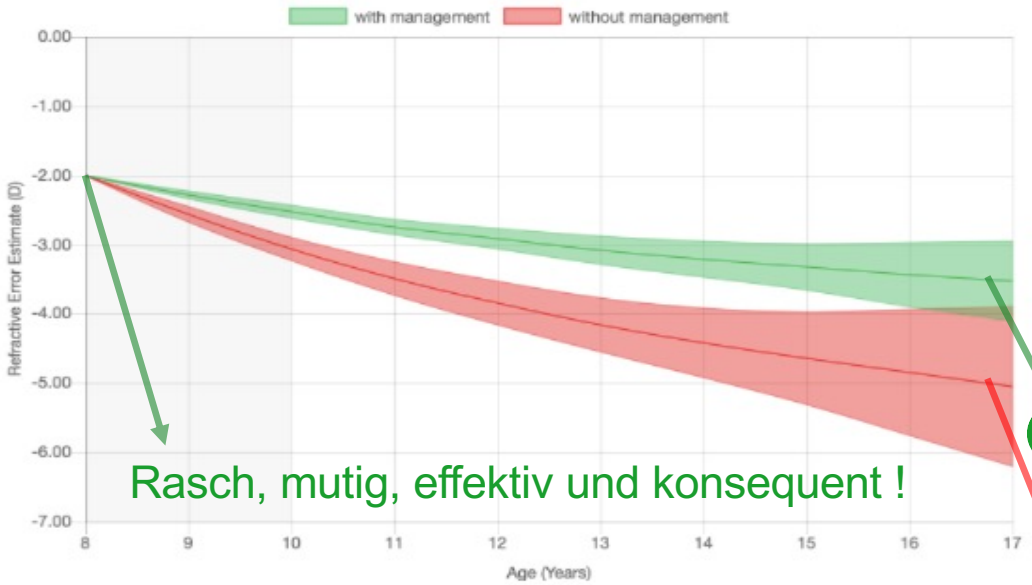
Child's Age (Years): 8

Refractive Error (D): -2.00

Myopia Management Option: Orthokeratology

Control Rate (%): 30 — 50 — 56

Peer Reviewed: ☑



Rasch, mutig, effektiv und konsequent !

Myopia Management Option:

Orthokeratology

Percentage reduction in progression of myopia compared to standard correction e.g. single vision spectacles.

50%

If treated with **Orthokeratology** that provides **50%** control, then the level of myopia at **17** may be:

-3.52D

If myopia control treatment is not commenced immediately, the final level of your child's myopia at **17** may be:

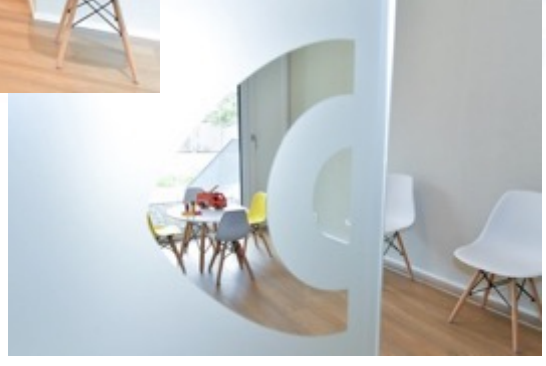
-5.04D

Vorgehen „Anna“

- **Aufklärung:**
  - Weniger Stunden lesen < 2 Std täglich
  - Lesedistanz erhöhen > 30cm
  - Vermehrt draussen spielen 2 Std täglich
- **Sehhilfen / Myopie Management:**
  - Atropin & SV Gläser -> 0.05% , jung und hohes Risikoprofil
  - Peripher Defokus Gläser -> DIMS / HALT
  - Kontaktlinsen -> Ortho-K, oder weich/hart peripher Defokus KL
- **Erste Erfolgskontrolle nach 6 bis 12 Mt:**
  - Therapie Erfolg kontrollieren
- **Resultat:** Rx **(besser alters korrelierte Biometrie e.g. Truckenbrod, Tideman, Kaymak)**
  - < 0.25dpt Progression = Tx Ziel erreicht = Tx weiterfahren
  - > 0.50dpt Progression = Tx Ziel verfehlt = **Tx anpassen !**
  - DIMS/HALT oder KL -> add Low Dose Atropine synergistisch = 0.01% / 0.02%
- **Nächste Erfolgskontrolle nach 6 Mt:**
  - Erfolg = Tx weiterfahren
  - Kein Erfolg = Systemwechsel ! **All-In ! z.B. 0.5% Atropin**

… und nun zum pharmazeutischen Management mit

Prof. Dr. med. Veit Sturm



Augenzentrum

am Rosengarten

Optisches Myopie Management: Brillengläser & Kontaktlinsen

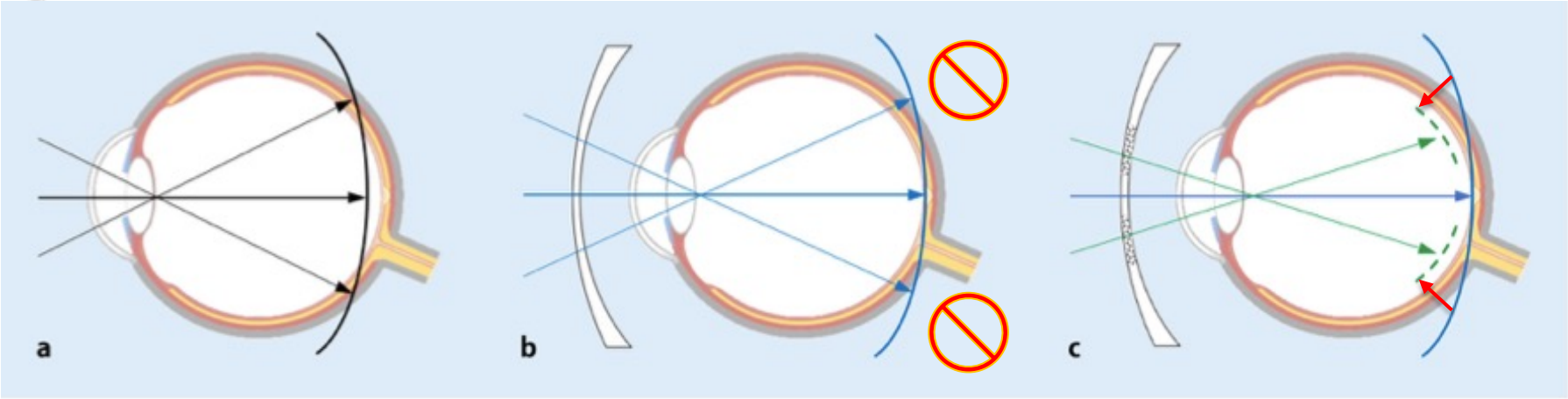


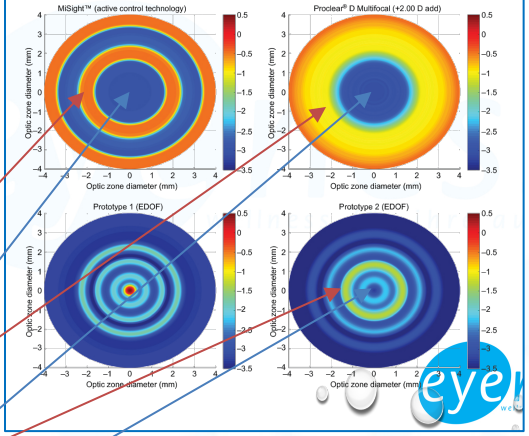
Abb. 1 ▲ Schematische Darstellung der optischen Verhältnisse im Auge (nicht maßstabsgetreu): **a** Bei unkorrigierter Myopie liegt die Bildschale zentral vor der Netzhaut und in der Peripherie zum Teil hinter der Netzhaut. **b** Durch Korrektur mit einem herkömmlichen Brillenglas wird die Fokusebene der optischen Abbildung (Bildschale) verschoben, wodurch sie zentral im Bereich der Fovea auf der Netzhaut, in der Peripherie allerdings hinter der Netzhaut liegt (hyperoper Defokus). **c** Bei Korrektur mit den DIMS-Gläsern liegt der zentrale Bereich der Bildschale auf der Netzhaut. Die DIMS-Linsen erzeugen in der Peripherie zusätzliche einzelne Brennpunkte, die vor der Netzhaut liegen

Myopie Management mit Kontaktlinsen

Das Myopie Management mittels Kontaktlinsen besteht aktuell aus zwei hauptsächlichen Methoden:

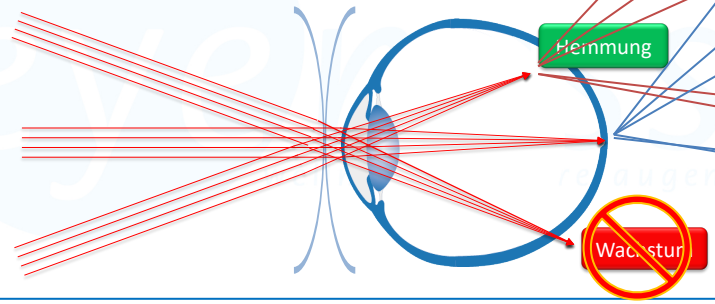
- Kontaktlinsen mit peripherem Defokus (weiche oder stabile KL)
- Orthokeratologie (stabile KL)

Dualfocus / EDOF / DC



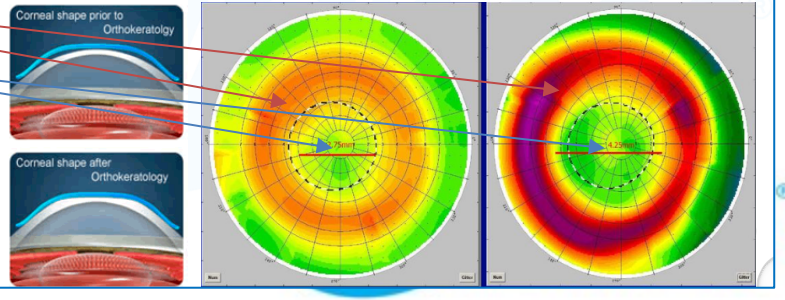
Peripherer Defokus

Die Refraktion in der Peripherie reguliert die Emmetropisierung



Orthokeratologie

Kontrollierte Verformung der kornealen Topographie zur temporären Korrektur der Ammetropie (z.B. Myopie)



FDA/CE zugelassene CH Kontaktlinsen zum Myopie Management 2022

Myopie Management Kontaktlinsen CH 2022

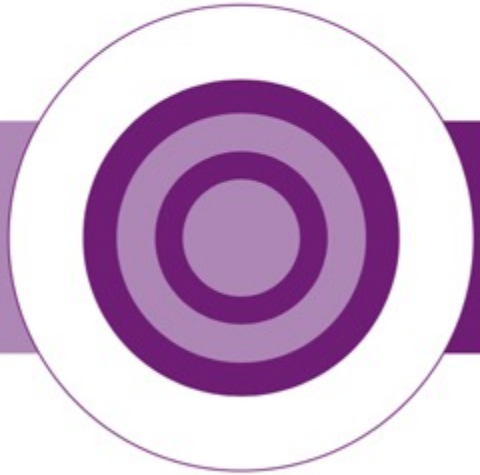
Firma	Produktname	Material		Tausch Rythmus					Funktions-prinzip			Stärkebereich in dpt	torisch	Basiskurve, Durchmesser, Material	Zulassung für MM	Weitere, zusätzliche Info
		stabil	weich	täglich	Monat	Quartal	Semester	Jährlich	Bi-/Multifokal	Asphärisch	Ortho-K	Minus Dpt	Ja / Nein	Individuell / Standardisiert	FDA / CE	
Appenzeller	Personnelle proASSIST		X				X	X	X			0.25 bis 30.0	Ja	Individuell	CE	
	i-SOFT proASSIST		X			X			X			0.25 bis 30.0	ja	Individuell	CE	
	iMap AS proASSIST	X						X	X			0.25 bis 30.0	Ja	Individuell	CE	
	i-NIGHT	X						X			X	0.50 bis 8.0	ja	Individuell	CE	
Cooper Vision	MiSight		X	X					X			0.25 bis 10.0	Nein	Standardisiert	FDA / CE	Dual Focus
Falco	FOK MC	X						X	X		X	1.0 bis 8.5	Ja	Individuell	CE	Myopia Control MC
Galifa	Individual Scalia 2		X					X	(x)	X		1.0 bis 30.0	Ja	Individuell	CE	
	Invispa Scalia 2		X			X	X		(x)	X		1.0 bis 30.0	Ja	Individuell	CE	
	Modula Scalia 2	X						X	(x)	X		1.0 bis 30.0	Ja	Individuell	CE	
	Luna	X						X			X	1.0 bis 6.0	Nein	Individuell	CE	
Mark'ennovy	Mylo		X		X				X			0.25 bis 15.0	demnächst	Individuell	CE	Extended Depth of Focus EDOF
SwissLens	Relax		X			X	X		X			0.01 bis 40.0	Nein	Individuell	CE	Hyperopic Defocus Control HDC
	Relax T		X			X	X		X			0.01 bis 40.0	Ja	Individuell	CE	
	RelaxFlex	X					X	X	X			0.01 bis 40.0	Nein	Individuell	CE	
	NightFlex Relax	X						X	X		X	0.01 bis 9.0	Ja	Individuel	CE	

Cooper Vision

MiSight® 1 day

FDA-Zulassung*
CE-Zertifizierung
für das Myopie Management.

Zwei Korrektionszonen
bieten den Kindern ein klares
scharfes Sehen ohne Brille



Zwei Kontrollzonen (+2,00 dpt)
für den myopischen Defokus

Korrektionszone

Behandlungszone für myopischen Defokus

1. Chamberlain P et al. A 3-year Randomized Clinical Trial of MiSight Lenses for Myopia Control. *Optom Vis Sci.* 2019; 96(8): 556-567.

*Indications for Use: MiSight® (omafilcon A) daily wear single use Soft Contact Lenses are indicated for the correction of myopic ametropia and for slowing the progression of myopia in children with non-diseased eyes, who at the initiation of treatment are 8-12 years of age and have a refraction of -0.75 to -4.00 diopters (spherical equivalent) with ≤ 0.75 diopters of astigmatism.The lens is to be discarded after each removal.

CooperVision

MiSight® 1 day

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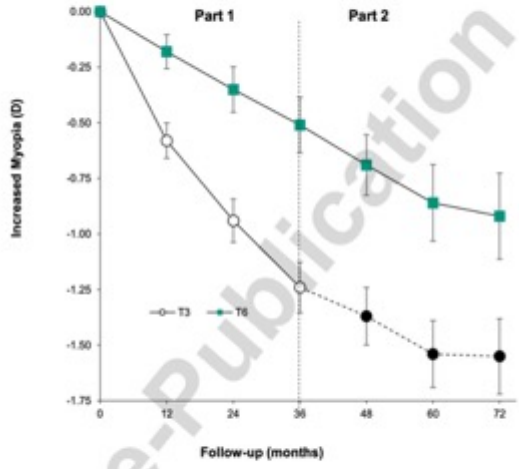
Long Term Effect of Dual-Focus Contact Lenses on Myopia Progression in Children: A 6-year Multicenter Clinical Trial

Figure 2 MiSight vs Control/MiSight

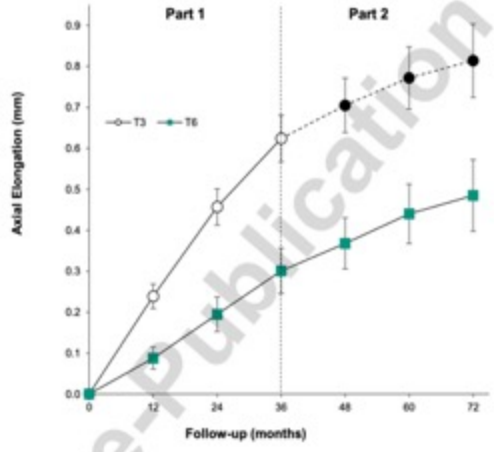


Control -> MiSight

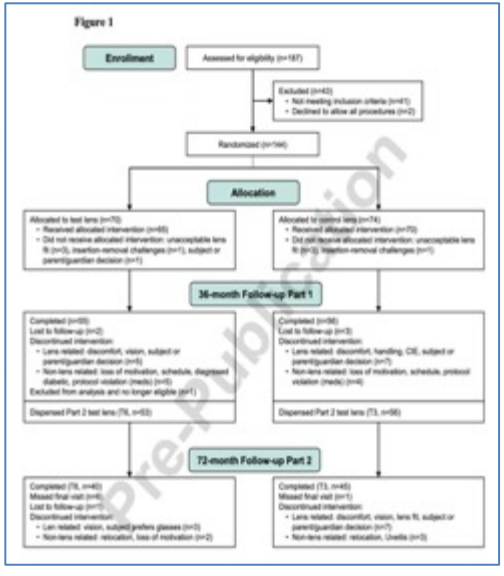
10y 13y 16y

Figure 3 MiSight vs Control/MiSight

Control -> MiSight



10y 13y 16y



(n=40/45); 54% caucas, 23% asia, 16% mix

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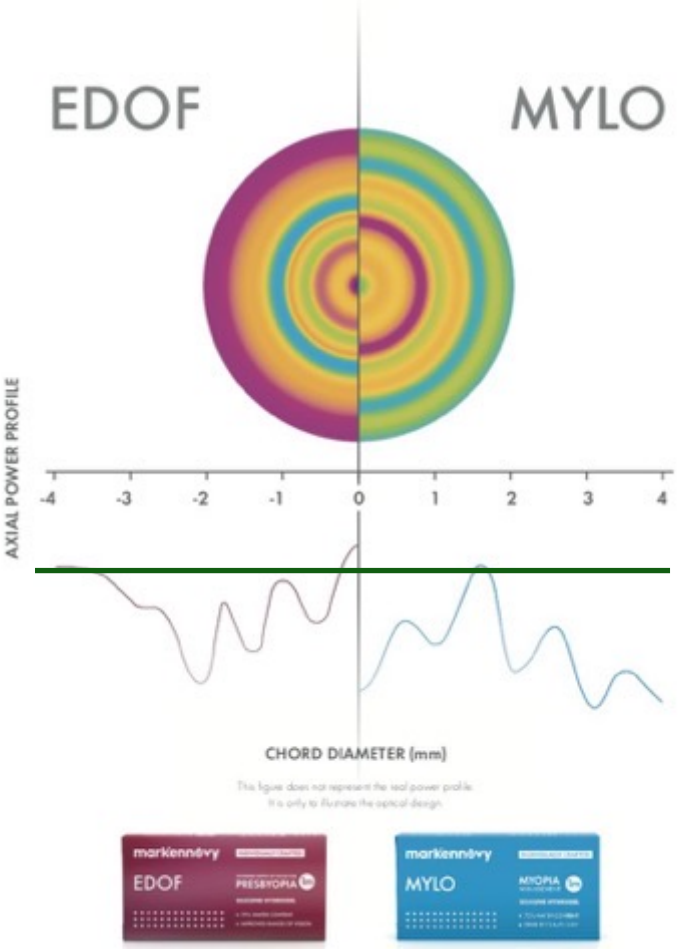
FROM markennovy

POWERED BY THE TECHNOLOGY OF

BRIEN HOLDEN VISION INSTITUTE



Presbyopie

Myopie

Fernkorrektion

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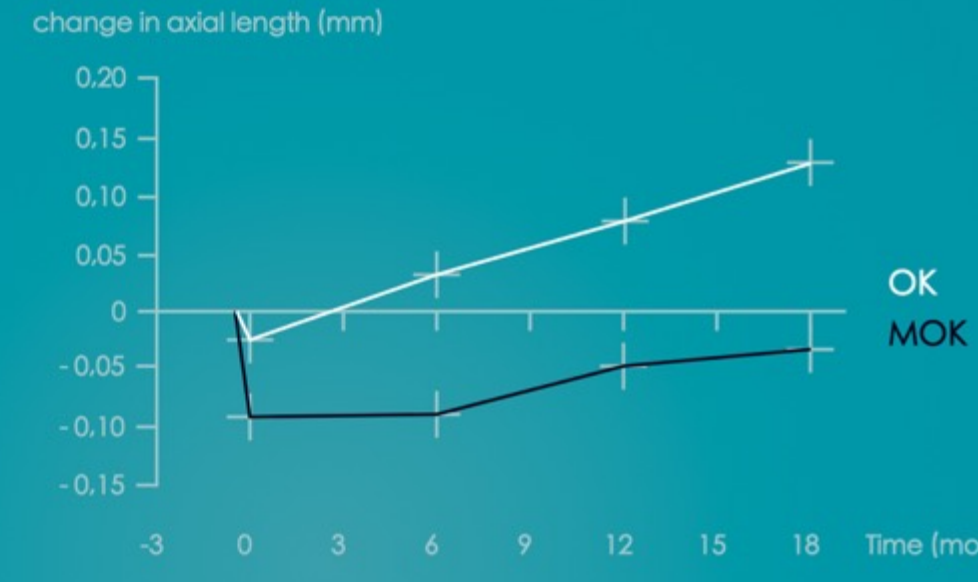
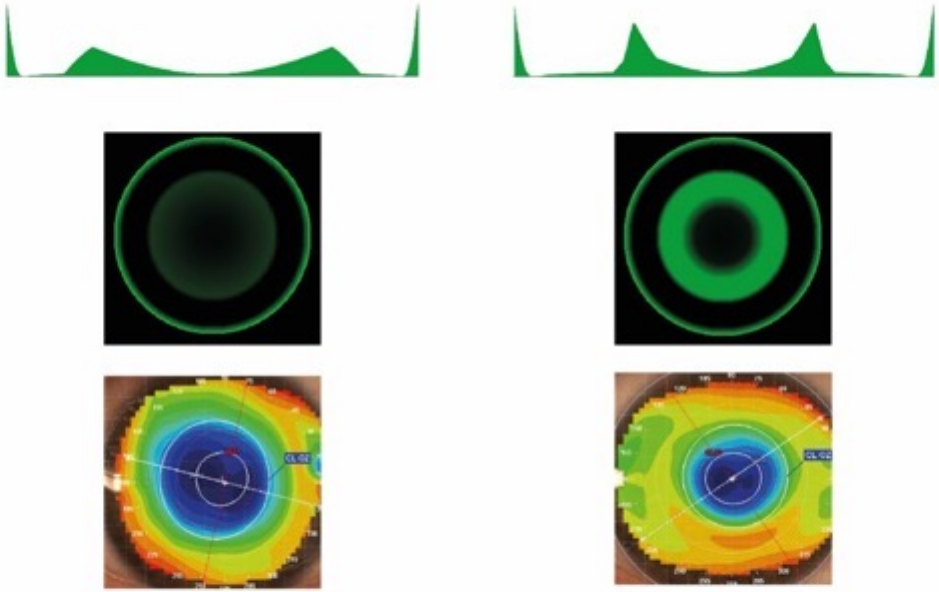
FALCO

ZUSAMMENFASSUNG DER STUDIE MIT DER FOK MC / FOKX MC VON FALCO LINSEN AG

Grafik: Quelle: The University of Auckland New Zealand; Martin Loertscher, John Phillips, Dep. of Optometry & Vision Sience 2014



SwissLens

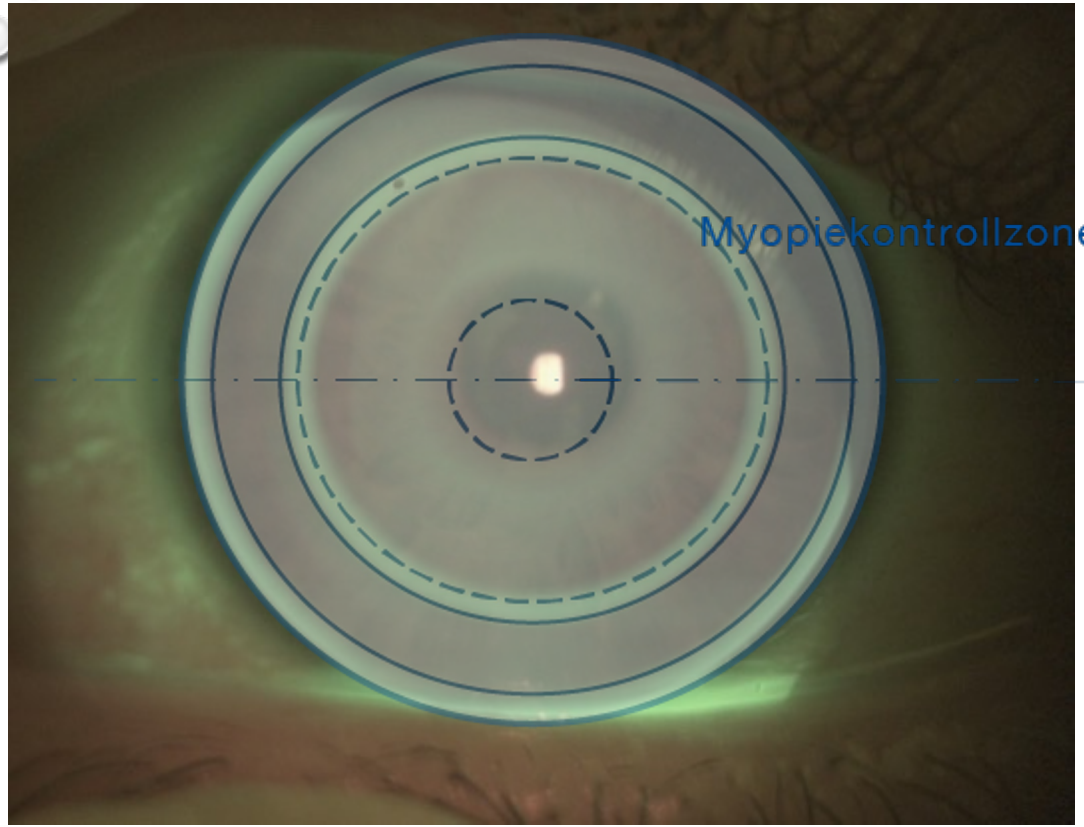


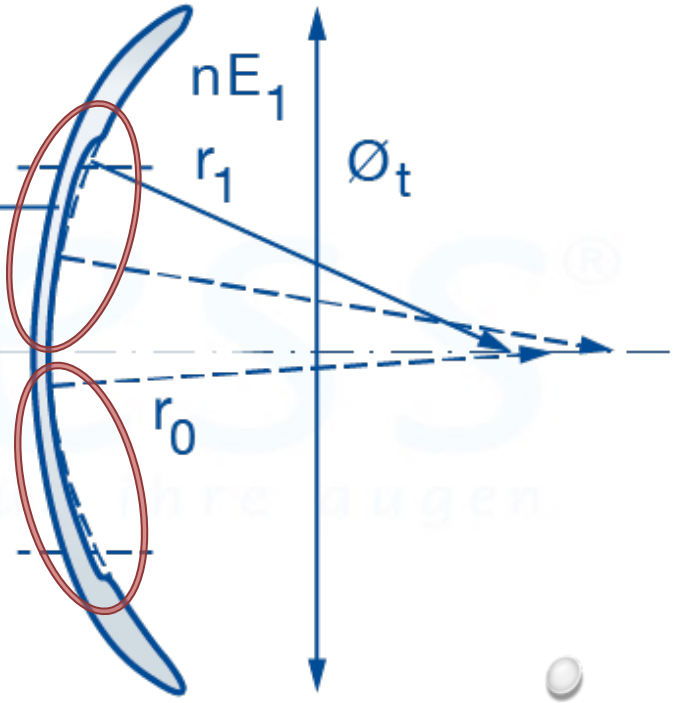
NightFlex
Standart Myopia -1.0 dpt

NightFlex Relax
OZ 5mm HDC Myopia -1.0 dpt

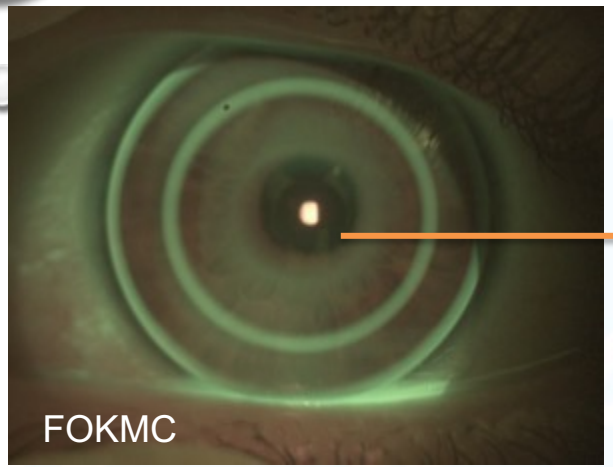
SwissLens

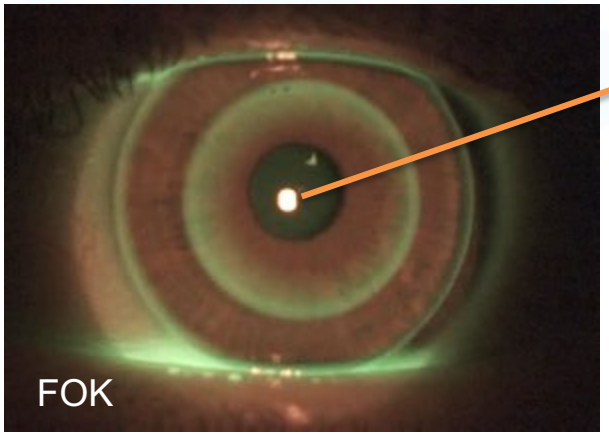
Patientin *ENIA, geb. 2012*

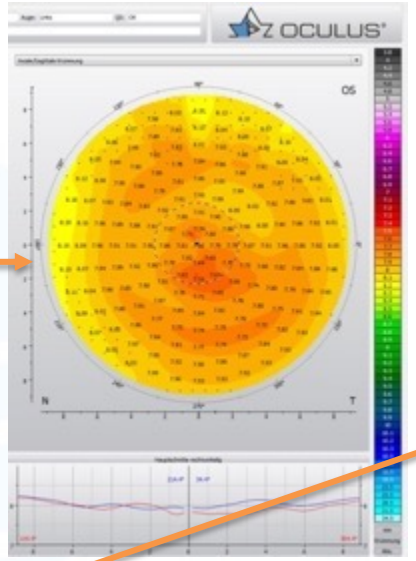


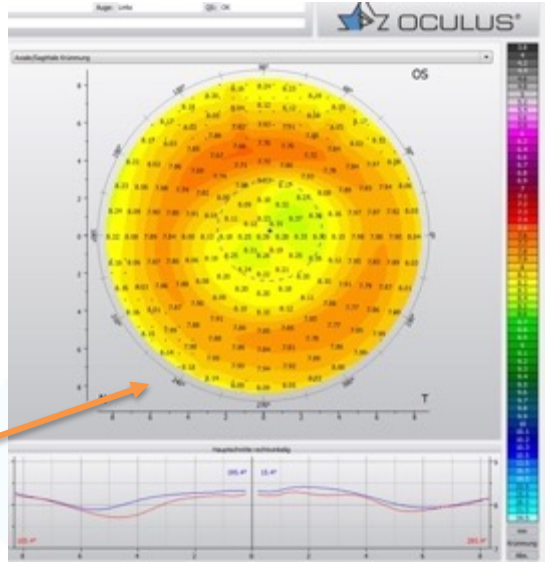


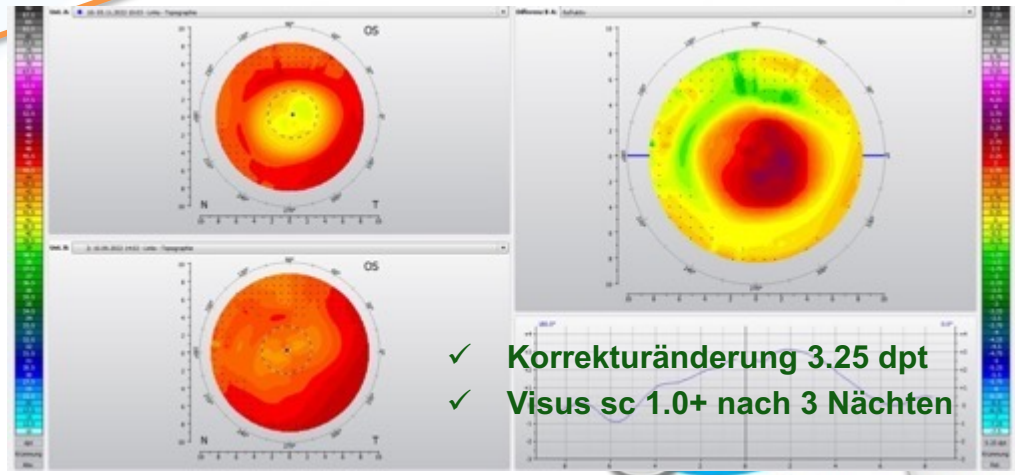
Patientin *ENIA*, *geb. 2012*











- ✓ **Korrekturänderung 3.25 dpt**
- ✓ **Visus sc 1.0+ nach 3 Nächten**

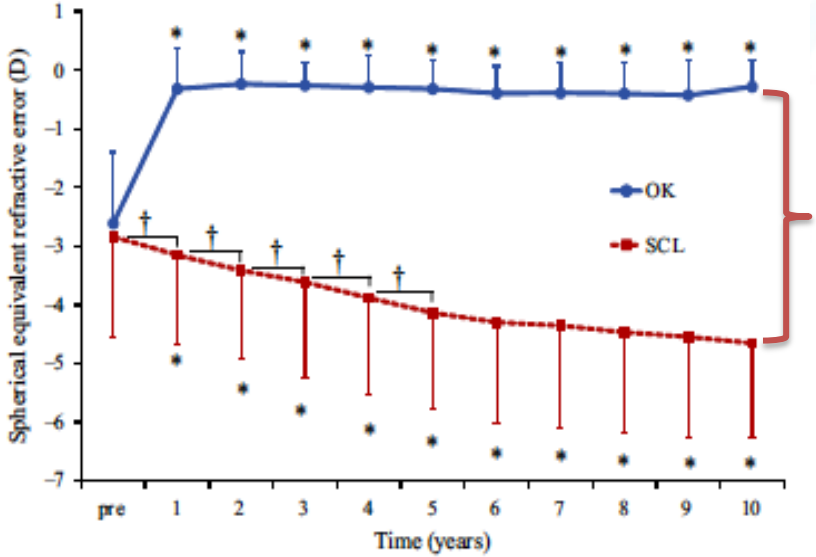
OPO OPHTHALMIC & PHYSIOLOGICAL OPTICS
THE JOURNAL OF THE COLLEGE OF OPTOMETRISTS
2018
Ophthalmic & Physiological Optics ISSN 0275-5408

Safety and efficacy following 10-years of overnight orthokeratology for myopia control

Takahiro Hiraoka[1], Yasuo Sekine[2], Fumiki Okamoto[1], Toshifumi Mihashi[1] and Tetsuro Oshika[1]

[1]Faculty of Medicine, Department of Ophthalmology, University of Tsukuba, Ibaraki, and [2]Kashiwa Eye Clinic, Chiba, Japan

Citation information: Hiraoka T, Sekine Y, Okamoto F, Mihashi T & Oshika T. Safety and efficacy following 10-years of overnight orthokeratology for myopia control. *Ophthalmic Physiol Opt* 2018; 38: 281–289. https://doi.org/10.1111/opo.12460



In conclusion, the present findings showed that OK treatment was effective in slowing myopia progression over a 10-year treatment period and demonstrated a clinically acceptable safety profile among patients between the ages of 8 and 16 years. Patients undergoing OK treatment do not need to wear any vision-correction aids during day-

Figure 1. Changes over time in manifest refraction for the OK and SCL groups. OK, orthokeratology; SCL, soft contact lens. *Statistically significant differences compared to the baseline value by the Bonferroni *post-hoc* test. †Statistically significant differences between successive years by the Bonferroni *post-hoc* test.

Three years experience of myopia control with contact lenses in Berne

Alexander Meyenberg (MD) [1], Michael Bärtschi (PhD) [2], Marc Fankhauser (BSc) [1,2]

[1] Augenärzte am Bollwerk Bern, dr.meyenberg@augen-arzt.ch
[2] Eyeness AG Bern, mbaertschi@eyeness.ch

SOG-SSO
2017 Davos

Results

138 eyes of 71 patients between the age of 7 and 18 years, mean 12.9 ± SD 2.1 years, were included, 12 patients (7 females, 5 males) choosing otho-k contact lenses, 14 patients (9 females, 5 males) bifoc-soft contact lenses, 45 patients (17 females, 28 males) spectacles. Full data sets including valid optical biometry measures were availabe for 24 eyes of the ortho-k group, 27 eyes of the bifoc-soft group, 87 eyes of the glasses group, respectively. Follow-up was 139 to 883 days, mean 520.8 ± SD 203.4 days. Contact lens fitting was successful in 92% of cases, all without complications during the follow-up period.

Conclusions

Ortho-k and bifocal silicone-hydrogel contact lenses showed a high level of safety for children and youths. Ortho-k contact lenses are a promising strategy to reduce myopia progression.

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Three years experience of myopia control with contact lenses in Berne

Alexander Meyenberg (MD) [1], Michael Bärtschi (PhD) [2], Marc Fankhauser (BSc) [1,2]

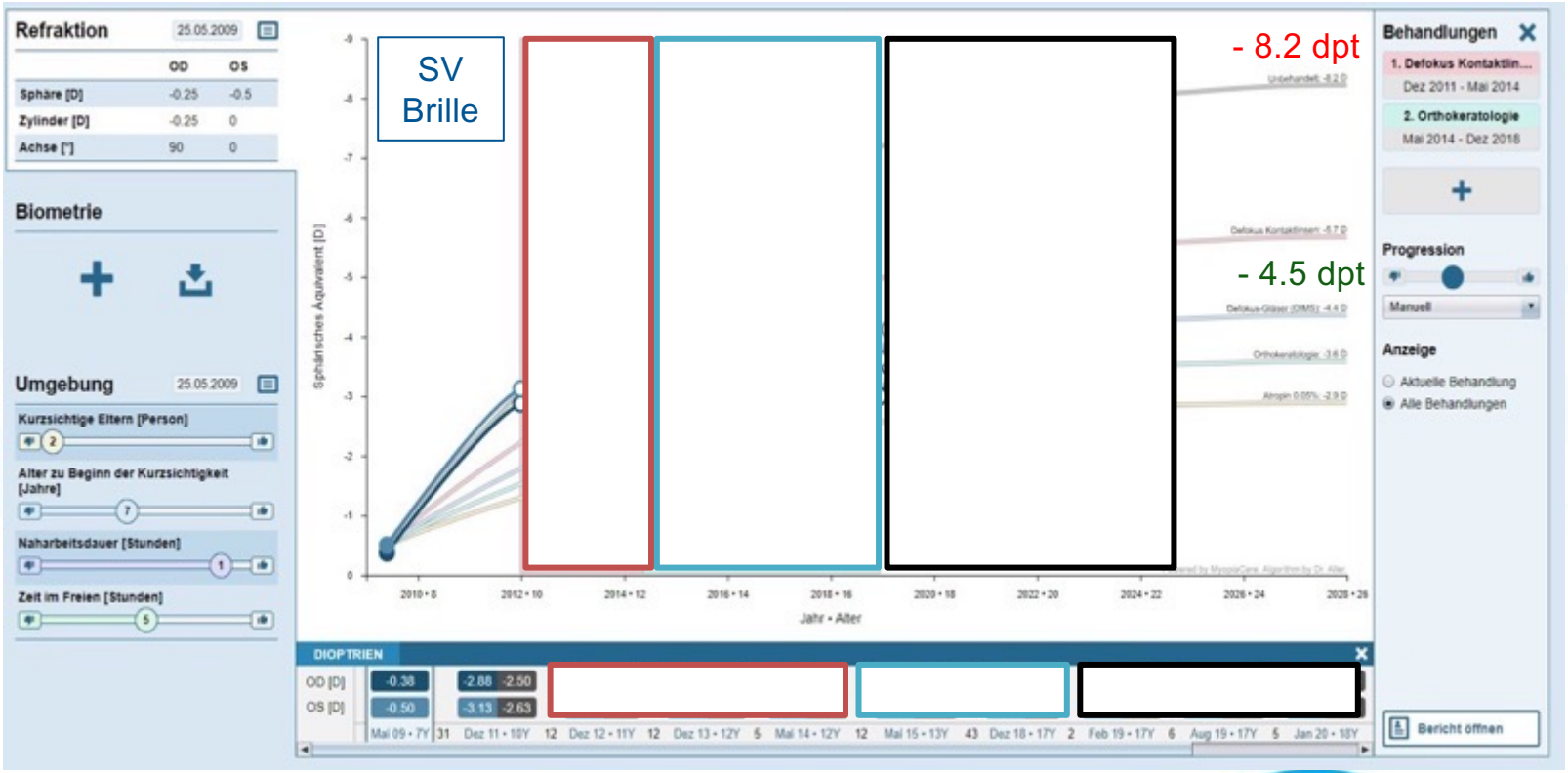
[1] Augenärzte am Bollwerk Bern, dr.meyenberg@augen-arzt.ch
[2] Eyeness AG Bern, mbaertschi@eyeness.ch

SOG-SSO
2017 Davos

Table 1.
Patient demographics and annual changes in refraction and axial length of age and caucasian ethnicity correlated study groups

	Ortho-k	Bifoc-soft	Glasses
Eyes / patients (n)	14 / 7	13 / 7	27 / 14
Females / males (n)	4 / 3	4 / 3	5 / 9
Age mean ± SD (years)	12.3 ± 2.4	12.2 ± 1.9	12.1 ± 1.5
Moderate or high myopic parents (%)	57	86	71
Follow-up mean ± SD (days)	604.5 ± 180.0	744.5 ± 82.6	595.7 ± 154.9
SE refractive error at first visit, mean ± SD (D)	-2.841 ± 1.510	-4.212 ± 1.720	-2.949 ±1.333
Annual change of SE refraction error, mean ± SD (D)	non available	-0.333 ± 0.257	-0.301 ± 0.255
Axial length at first visit, mean ± SD (mm)	24.566 ± 0.997	25.369 ± 0.965	24.381 ± 1.014
Annual change of axial length, mean ± SD (mm)	0.059 ± 0.072 ++	0.175 ± 0.081 -	0.131 ± 0.094 -

Fallbeispiel “Luana, 2001”



Refraktive Entwicklung

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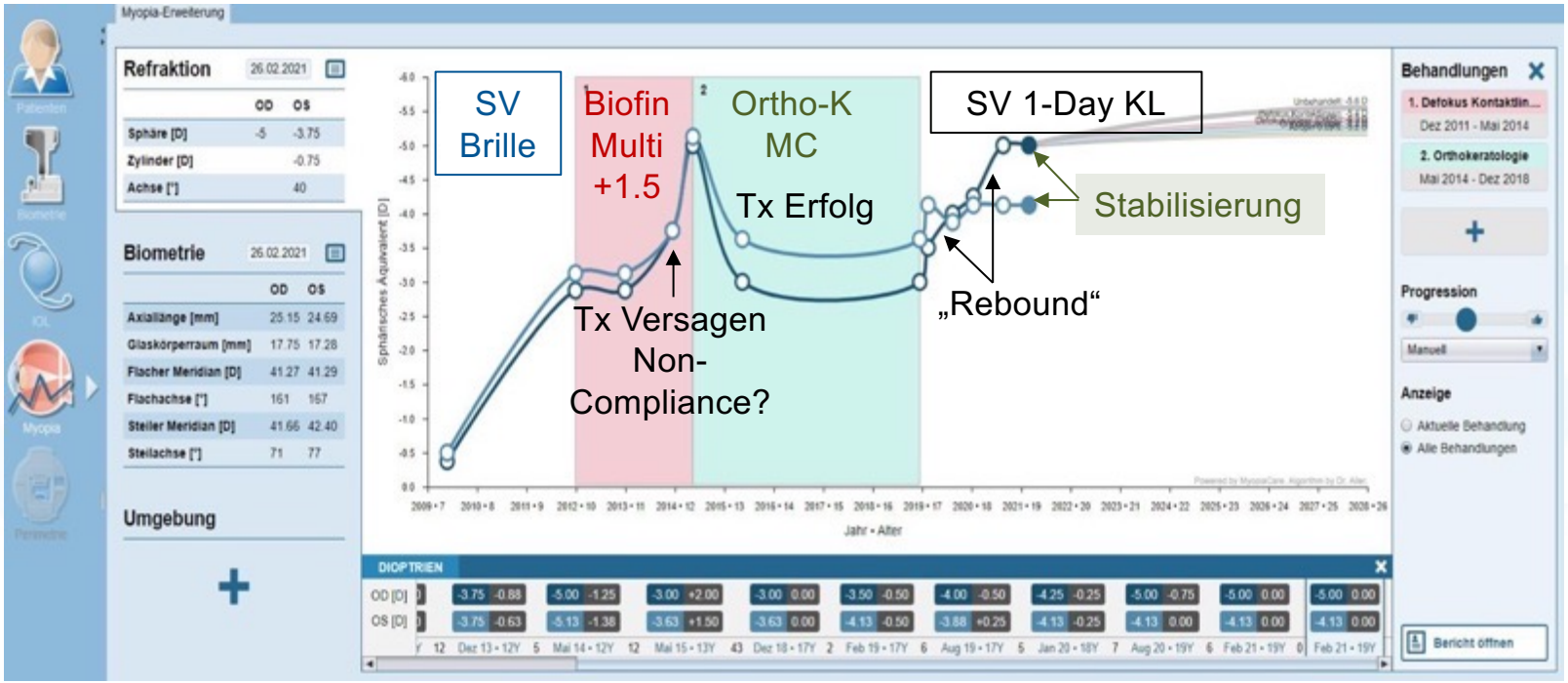
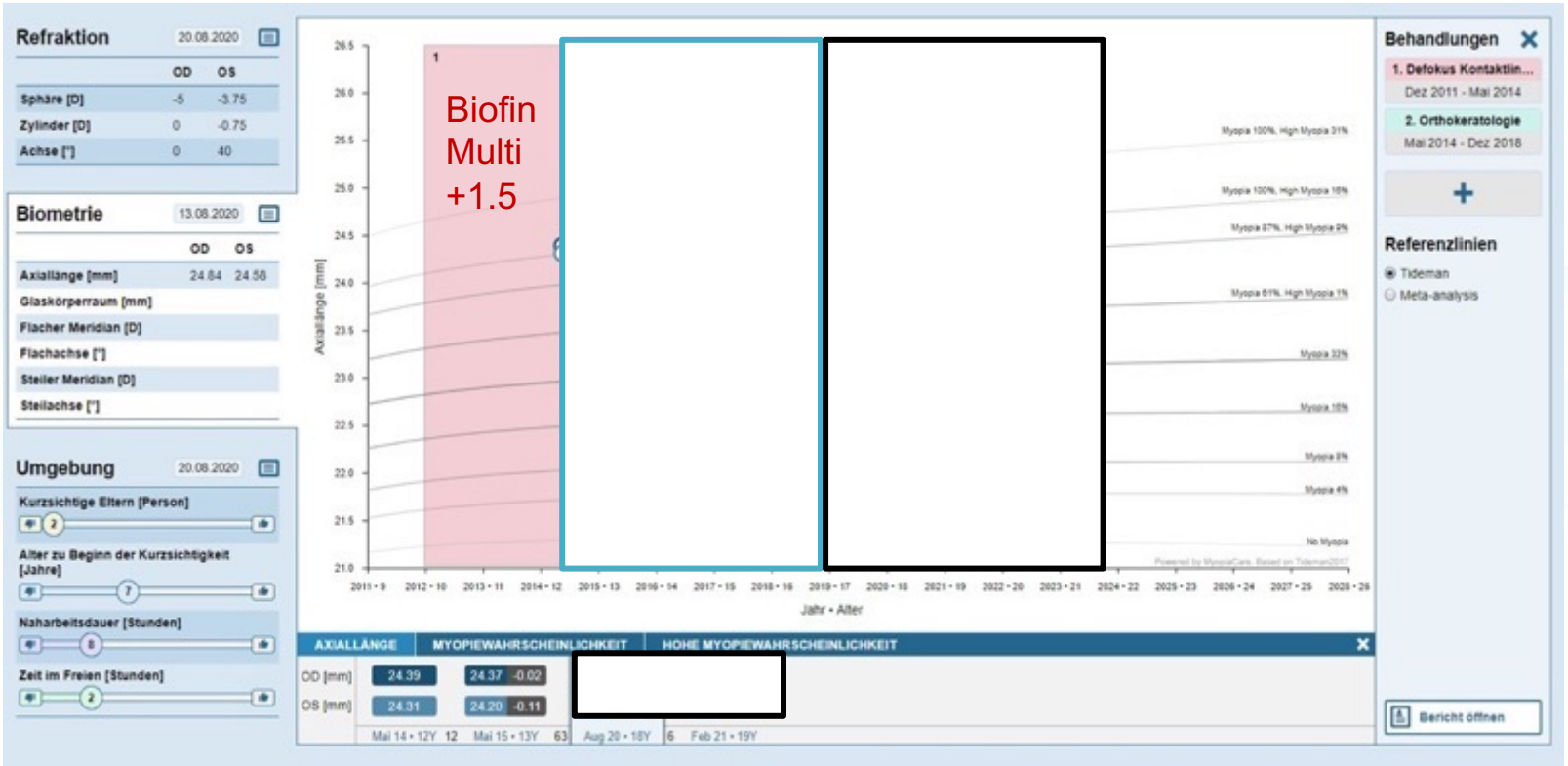
Fallbeispiel “Luana, 2001”



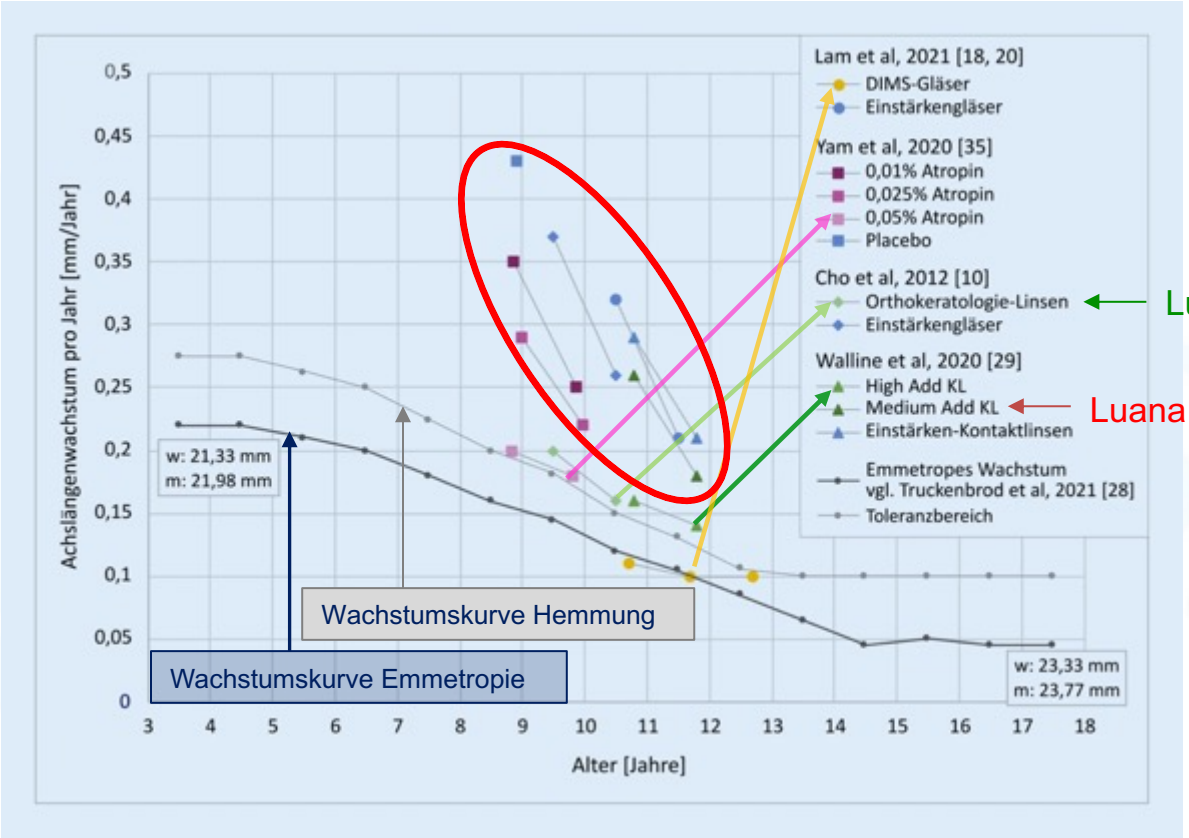
2021: Stabile Prognose
nach (unnötigem) „Rebound“

Fallbeispiel “Luana, 2001”



Entwicklung axiale Länge

Therapie Erfolg



Luana 2014-18

Luana 2012-14

Carolin Truckenbrod
MScOphthalmology

Das diagnostische und therapeutische Prinzip

Ophthalmologe
https://doi.org/10.1007/s00347-021-01452-y
Eingegangen: 3. Mai 2021
Überarbeitet: 9. Juni 2021
Angenommen: 16. Juni 2021

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Myopietherapie und Prophylaxe mit „Defocus Incorporated Multiple Segments"-Brillengläsern

Hakan Kaymak[1,2] · Birte Graff[2,3] · Kai Neller[2,3] · Achim Langenbucher[2] · Berthold Seitz[4] · Hartmut Schwahn[1]

[1] Internationale Innovative Ophthalmochirurgie GbR, Düsseldorf, Deutschland
[2] Institut für Experimentelle Ophthalmologie, Universitätsklinikum des Saarlandes UKS, Homburg/Saar, Deutschland
[3] Internationale Innovative Ophthalmochirurgie GbR, Düsseldorf, Deutschland
[4] Klinik für Augenheilkunde, Universitätsklinikum des Saarlandes UKS, Homburg/Saar, Deutschland

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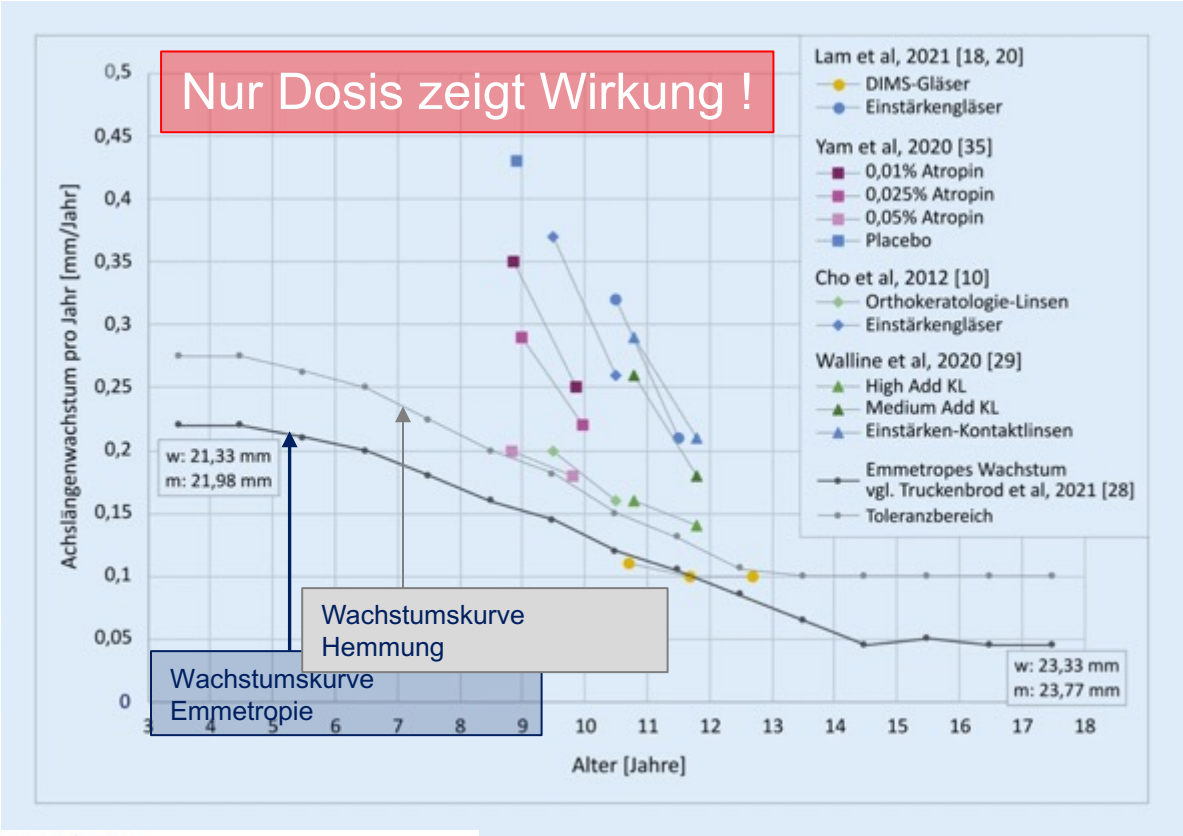
Therapie Erfolg



Carolin Truckenbrod
MScOphthalmology

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Ophthalmologe
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[4] Klinik für Augenheilkunde, Universitätsklinikum des Saarlandes UKS, Homburg/Saar, Deutschland

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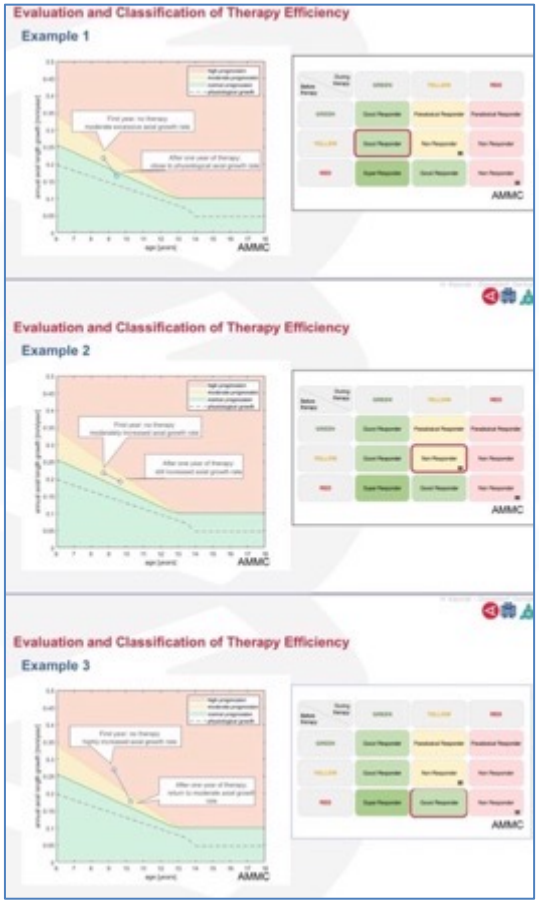
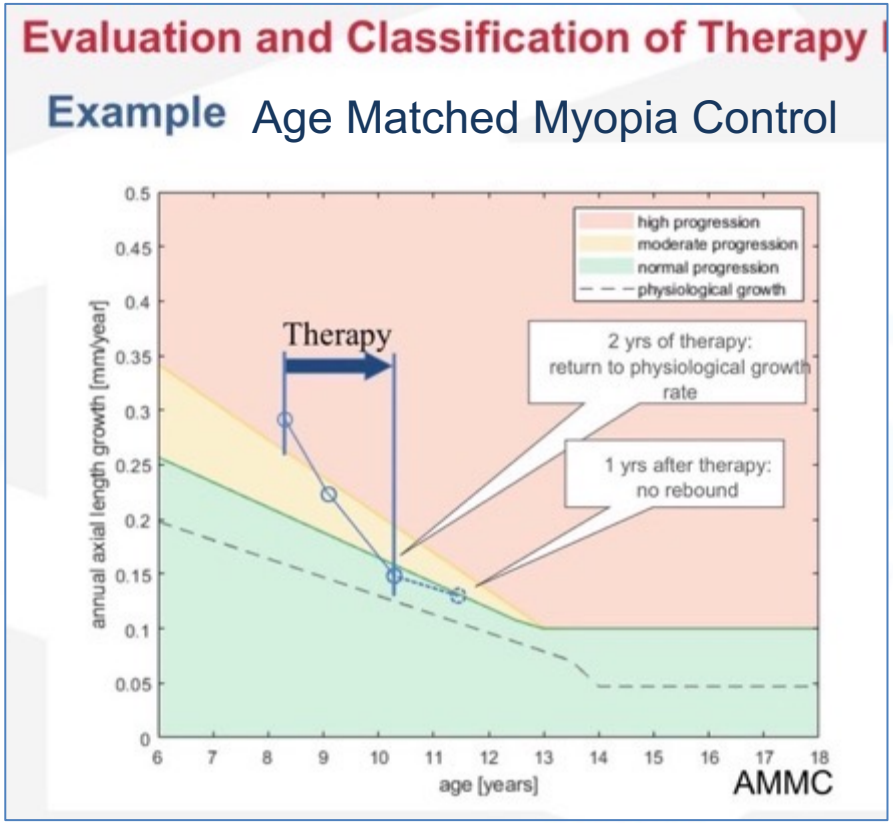
Therapie Erfolg visualisieren





Lehren aus “Luana, 2001”

- ✓ Myopie konnte gehemmt werden (-4.5 statt -8 dpt)
- ✓ Keine „Adverse Events“ mit KL bisher (2012 – 2022)
- - Zu geringe Dosierung (Add.) führte zu Tx Versagen im 2. Jahr
- - Zu früher Tx Stop führte zu (unnötigem) Rebound

2012
1. Tag
Biofinity Multi

2016
Ortho-K
Falco

2021
1-Day Oasys
(aktuell)

Synergistisches Myopie Management: Atropin und Ortho -K

asiatisch, 10 Jahre alt, -4.5 dpt

Journal of Clinical Medicine 2018 MDPI

Article

The Synergistic Effects of Orthokeratology and Atropine in Slowing the Progression of Myopia

Lei Wan [1,2,3,4,*], Chang-Ching Wei [5,6], Chih Sheng Chen [1,7], Ching-Yao Chang [2], Chao-Jen Lin [8,9], Jamie Jiin-Yi Chen [10], Peng-Tai Tien [6,10,11] and Hui-Ju Lin [1,10,*]

1 School of Chinese Medicine, China Medical University, Taichung 404, Taiwan
2 Department of Biotechnology, Asia University, Taichung 413, Taiwan; cychang@asia.edu.tw
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4 Research Center for Chinese Medicine & Acupuncture, China Medical University, Taichung 404, Taiwan
5 Children's Hospital, China Medical University Hospital, Taichung 404, Taiwan; weilonger@gmail.com
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7 Division of Chinese Medicine, Asia University Hospital, Taichung 413, Taiwan; pluto915@mail2000.com.tw
8 Department of Pediatrics, Changhua Christian Children's Hospital, Changhua 500, Taiwan; 124140@cch.org.tw
9 School of Medicine, Chung Shan Medical University, Taichung 402, Taiwan
10 Department of Ophthalmology, China Medical University Hospital, Taichung 404, Taiwan; jane.editing@gmail.com
11 Graduate Institute of Clinical Medical Science, China Medical University, Taichung 404, Taiwan
* Correspondence: leiwan@mail.cmu.edu.tw or lei.joseph@gmail.com (L.W.); d2396@mail.cmuh.org.tw (H.-J.L.); Tel.: +886-(0)4-22053366 (ext. 3326) (L.W.); +886-(0)4-22053366 (ext. 3326) (H.-J.L.)

Received: 3 August 2018; Accepted: 5 September 2018; Published: 7 September 2018

check for updates

Abstract: Atropine and orthokeratology (OK) are both effective in slowing the progression of myopia. In the current study, we studied the combined effects of atropine and OK lenses on slowing the progression of myopia. This retrospective study included 84 patients who wore OK lenses and received atropine treatment (OA) and 95 patients who wore OK lenses alone (OK) for 2 years. We stratified patients into low (<6 D, LM) and high (≥6 D, HM) myopia groups, as well as two different atropine concentrations (0.125% and 0.025%). Significantly better LM control was observed in OA1 patients, compared with OK1 patients. Axial length was significantly shorter in the OA1 group (24.67 ± 1.53 mm) than in the OK1 group (24.9 ± 1.98 mm) ($p = 0.042$); similarly, it was shorter in the OA2 group (24.73 ± 1.53 mm) than in the OK2 group (25.01 ± 1.26 mm) ($p = 0.031$). For the HM patients, OA3 patients compared with OK3 patients, axial length was significantly shorter in the OA3 group (25.78 ± 1.46 mm) than in the OK3 group (25.93 ± 1.94 mm) ($p = 0.021$); similarly, it was shorter in the OA4 patients (25.86 ± 1.21 mm) than in the OK4 patients (26.05 ± 1.57 mm) ($p = 0.011$). Combined treatment with atropine and OK lenses would be a choice of treatment to control the development of myopia.

Zusätzlicher Effekt ca. 20%

5. Conclusions

Atropine and OK lenses involve completely different mechanisms to slow myopia progression; hence, together they provide improving control of myopia progression than either atropine or OK lenses alone. In the present study, we provide the clinical evidence that combined treatment with atropine and OK lenses achieves a slightly better control of myopia progression.

Synergistisches Myopie Management: Atropin und Ortho -K

asiatisch, 10 Jahre alt, -2.5 dpt

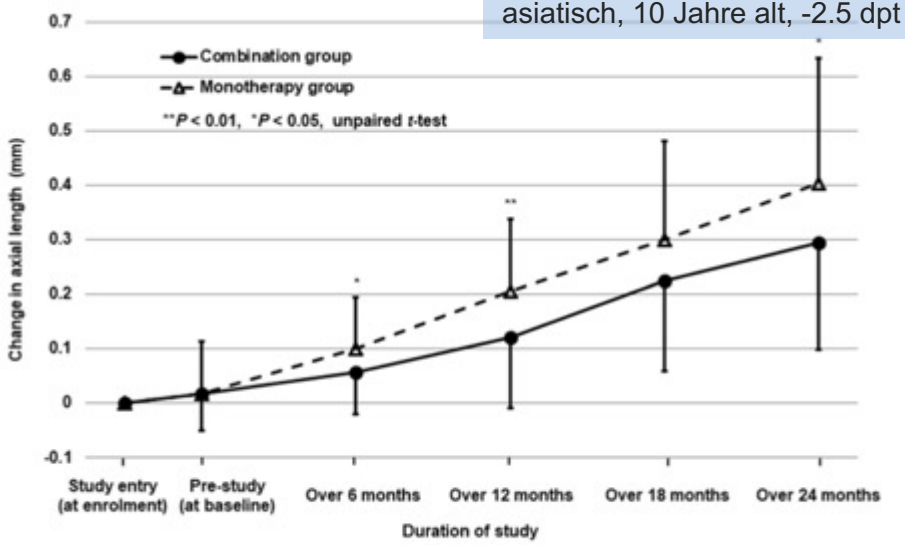

Figure 2. Time courses of changes in axial length in the orthokeratology and 0.01% atropine combination group and the orthokeratology monotherapy group. Error bars represent the standard deviation.

2020

SCIENTIFIC REPORTS
nature research

Efficacy of combined orthokeratology and 0.01% atropine solution for slowing axial elongation in children with myopia: a 2-year randomised trial

Nozomi Kinoshita[1,2], Yasuhiro Konno[2], Naoki Hamada[3], Yoshinobu Kanda[4], Machiko Shimmura-Tomita[3], Toshikatsu Kaburaki[3] & Akihiro Kakehashi[1]

SCIENTIFIC REPORTS | (2020) 10:12750 | https://doi.org/10.1038/s41598-020-69710-8

Zusätzlicher Effekt

ca. 25% bei geringer Myopie

ca. 5% bei hoher Myopie*

* => besser 0.025/0.05% ??

During the 2-year follow-up period, the combination of OK and 0.01% atropine was more effective in slowing axial elongation than OK alone in children with myopia, especially in the first year. The efficacy of combined OK and 0.01% atropine therapy for slowing axial elongation was greater in children with low initial myopia. Combination therapy was equally as effective as OK monotherapy in children with moderate initial myopia because OK therapy slowed axial elongation more effectively in these children. Using 0.01% atropine ophthalmic solution together with OK therapy may be a usable and optimal treatment option to slow axial elongation, especially in children with low initial myopia.

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Synergistisches Myopie Management: Atropin und Ortho-K

ARTICLE IN PRESS
Contact Lens and Anterior Eye xxx (xxxx) xxx
Contents lists available at ScienceDirect
Contact Lens and Anterior Eye
journal homepage: www.elsevier.com/locate/clae

Combined 0.01% atropine with orthokeratology in childhood myopia control (AOK) study: A 2-year randomized clinical trial

Qi Tan [b,*], Alex LK Ng [b,c], George PM Cheng [d], Victor CP Woo [b,c], Pauline Cho [a]

2022

asiatisch, 9 Jahre alt, -2.5 dpt

Contact Lens and Anterior Eye xxx (xxxx) xxx

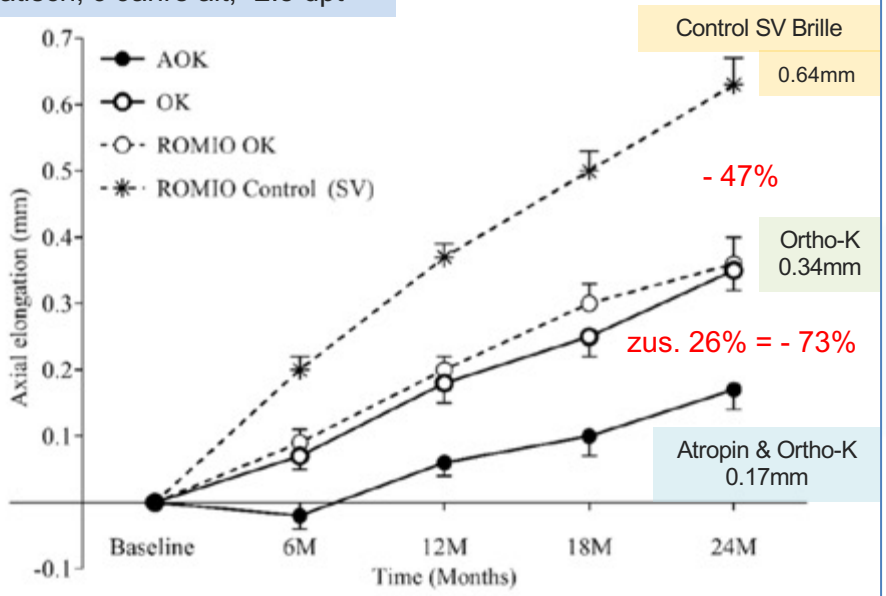

Fig. 2. Cumulative axial elongation over two years in the two groups of subjects in the AOK study compared to subjects in ROMIO study [14].
AOK – Combined atropine with orthokeratology; OK – Orthokeratology alone; ROMIO – Retardation of Myopia in Orthokeratology; SV – Single vision spectacles; Error bars indicate the standard error.

Table 4
Summary of symptoms and adverse events reported by subjects received treatment (numbers and percentage) in the two groups.

Symptom	AOK n = 45	OK n = 44	P
Photophobia	6(13%)	0	0.006
Halo	4(9%)	2(5%)	0.677
Blurred vision	4(9%)	6(14%)	0.478
Itching	3(7%)	4(9%)	0.671
Dry eye	2(4%)	2(5%)	0.982
Adverse events			
Infiltrative keratitis	1(2%)	1(2%)	0.987
Corneal erosion	1(2%)	1(2%)	0.987
Conjunctival cyst	1(2%)	0	0.320
Conjunctivitis	3(7%)	3(7%)	0.977
Hordeolum	2(4%)	3(7%)	0.627
≥ Grade 2 staining (Efron's scale)	0	1(2%)	0.309
Chicken Pox	1(2%)	0	0.320
Hospitalization	0	1(2%)*	0.309

AOK – Combined atropine with orthokeratology.
OK – Orthokeratology alone.
P – Probability value of comparison of the percentage of subjects between the two groups, using Crosstab analyses.
*Hospitalization due to broken leg for two months.

Zusätzlicher Effekt + 26%

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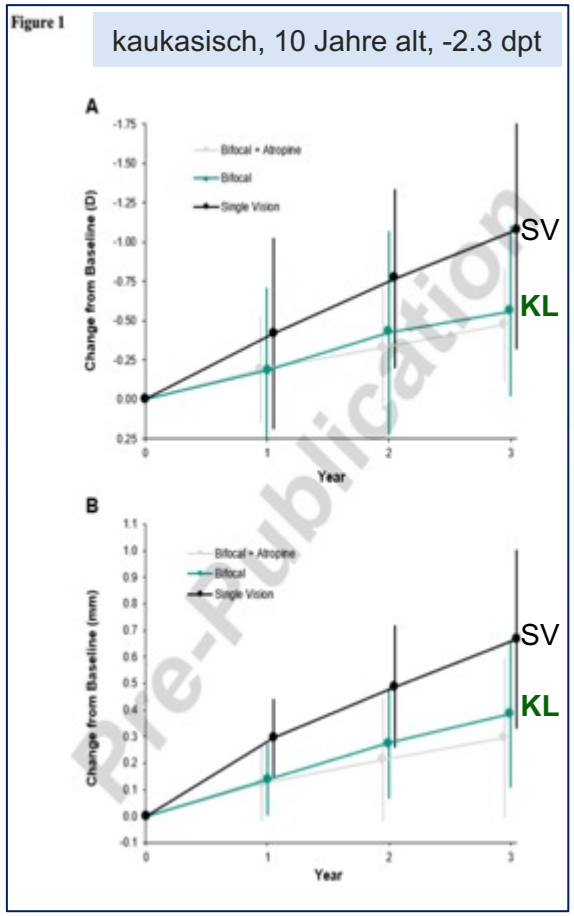
Synergistisches Myopie Management: Atropin und weiche bifokale KL



Zusätzlicher Effekt

ca. 21% bei AXL

ca. 5% bei SER

DISCUSSION

In this 3-year non-randomized clinical study, the results indicate that combining 0.01% atropine with soft multifocal contact lens wear failed to demonstrate slower myopia progression or eye growth than using multifocal lenses alone, but both the combination treatment and soft multifocal contact lens treatment slowed myopia progression and eye growth significantly more than single vision contact lenses.

Merci viu Mau !

Für weitere Fragen: mbaertschi@eyeness.ch
eyeness AG, Hirschengraben 11, 3011 Bern

… und nun zum Brillenglas Management mit Torben Othersen, HOYA

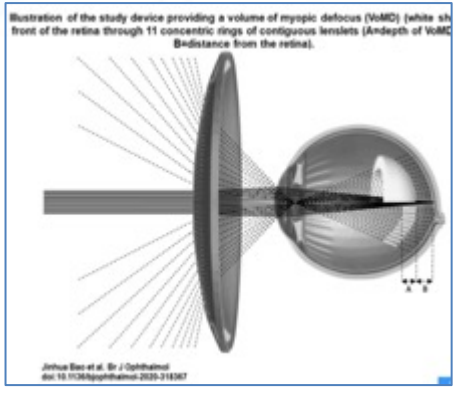
Clinical science

OPEN ACCESS

Myopia control effect of defocus incorporated multiple segments (DIMS) spectacle lens in Chinese children: results of a 3-year follow-up study

Carly SY Lam ,[1,2] Wing Chun Tang,[1] Paul H Lee ,[3] Han Yu Zhang ,[1] Hua Qi,[4] Keigo Hasegawa,[4] Chi Ho To[1,2]

Spectacle Lenses With Aspherical Lenslets for Myopia Control vs Single-Vision Spectacle Lenses
A Randomized Clinical Trial



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Infographik IMI publiziert 25. August 2021

INTERNATIONAL MYOPIA INSTITUTE

International Myopia Institute (IMI) Facts and Findings

myopiainstitute.org

Impact of myopia

2020
Myopia affects almost
30% of the world's population

2050
Myopia is estimated to affect
50%
High myopia will affect
10% of the world's population

Myopia -0.50 D or worse
High myopia -5.00 D or worse

Risk of vision impairment
Uncorrected myopia is a leading cause of avoidable vision impairment. Complications associated with high myopia can be sight threatening e.g. myopic macular degeneration.

Education
In children, poor vision or uncorrected vision can impact scholastic performance and result in psychosocial stress. Negative attitudes to spectacle wear may also affect psychosocial well-being.

Quality of Life (QOL)
Reduced QOL has been demonstrated for myopia and myopia-related complications. QOL is impacted whether myopia is corrected or uncorrected and varies according to the type of corrective modality worn.

Economic impact
Given the progressive nature of myopia, direct costs (expenditure on diagnosis, correction/management, transport and treatment of morbidity) and lost productivity costs are substantial.

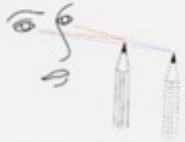
Risk factors

Higher levels of education and near work

Less time outdoors

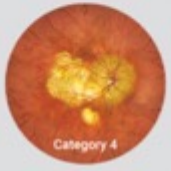
- East Asian ethnicity
- Parents with myopia
- Girls more susceptible according to some studies

Binocular vision



- Link with myopia development is unclear
- Important to optimize binocular vision in children to provide a single clear image

Pathologic myopia



META-PM classification system

Category	Retinal signs
0	No myopic retinal lesions
1	Tessellated (or tigroid) fundus
2	Diffuse choroidal atrophy
3	Patchy choroidal atrophy
4	Macular atrophy
Plus lesion	Lacquer cracks, myopic choroidal neovascularization, Fuchs spot
Posterior staphyloma	—

3%
of the world's population **is affected by pathologic myopia**

1-3% Asians
1% Europeans

Affects
50-70%
of those with high myopia

Increases with age and spherical equivalent

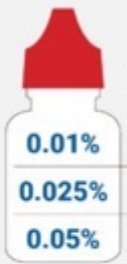
Increases in prevalence and severity 40+ years

Management options – Reported treatment effectiveness varies with age of initiation, treatment duration as well as demographic/environmental factors.*

Prevention

80 to 120 minutes outdoors **daily**

Pharmacological option



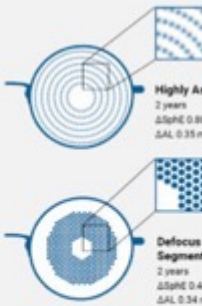
Atropine LAMP Study
2 years

0.01%	ΔSphE 1.12 D ΔAL 0.59 mm
0.025%	ΔSphE 0.85 D ΔAL 0.50 mm
0.05%	ΔSphE 0.55 D ΔAL 0.39 mm

Total average change in SphE and AL over two years.

Slowing progression – Spectacle and contact lens treatments typically impose myopic defocus on a local retinal region

Spectacle options



Highly Aspherical Lenslets (HAL)
2 years
ΔSphE 0.80 D (55%)
ΔAL 0.35 mm (51%)

Defocus Incorporated Multiple Segments (DIMS)
2 years
ΔSphE 0.44 D (32%)
ΔAL 0.34 mm (62%)

Peripheral Hyperopia Reduction Lens
2 years
ΔSphE 0.04 D (3%)
ΔAL 0.04 mm (5%)

Executive prismatic bifocals
3 years
ΔSphE 1.05 D (51%)
ΔAL 0.28 mm (34%)

Progressive Addition Lens (PALS)*
2 years
ΔSphE 0.14 D (24%)
ΔAL 0.04 D (28%)

Contact lens options

Dual-focus
3 years
ΔSphE 0.79 D (59%)
ΔAL 0.32 mm (52%)
US FDA approved

Extended depth of focus
2 years
ΔSphE 0.37 D (32%)
ΔAL 0.46 mm (25%)

Center distance
3 years
ΔSphE 0.46 D (44%)
ΔAL 0.23 mm (35%)

Orthokeratology*
2 years
ΔAL 0.27 mm (45%)
Worn overnight

Soft contact lenses - worn daily

* See IMI white papers for details of recent study results quoted. Note: The relationship of AL and SphE varies with level of myopia. + Meta-analysis

Δ= reduction in average progression compared to control group; SphE = spherical equivalent refractive error; AL = axial length

Authors: Monica Jong, James Wolffsohn, Christine Wildsoet, Jost Jonas, Ian Morgan, Nicola Logan, Kyoko Ohno-Matsui, Padmaja Sankaridurg, Serge Resnikoff.
Source: IMI white papers 2019, 2021 https://myopiainstitute.org/imi-white-papers/ Investigative Ophthalmology & Visual Science IMI special issues 60(3) 2019 and 62(5) 2021

Zeitpunkt des Ausstiegs

www.nature.com/scientificreports

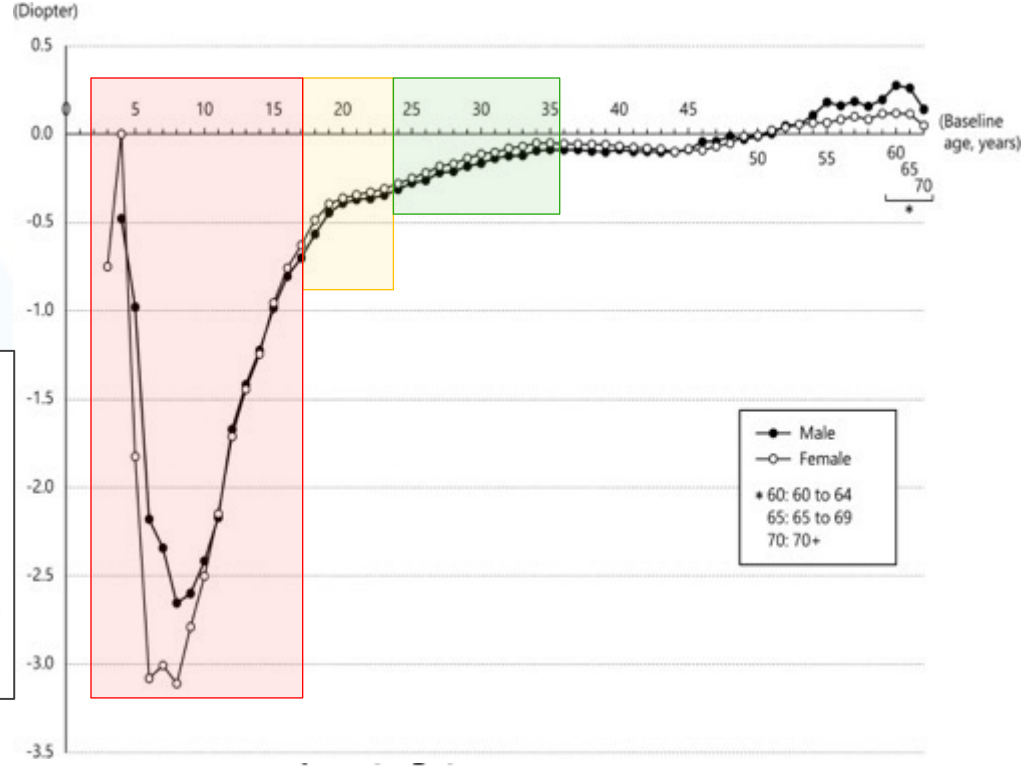
scientific reports

OPEN

Longitudinal analysis of 5-year refractive changes in a large Japanese population

Masaki Takeuchi[1,2], Akira Meguro[1,2✉], Masao Yoshida[3], Takahiro Yamane[1,2], Keisuke Yatsu[1,3], Eiichi Okada[4] & Nobuhisa Mizuki[1,2]

Refractive changes are reportedly affected by age, sex, and current refractive error. To clarify the pattern of refractive changes in a Japanese population, we conducted a 5-year follow-up longitudinal analysis of spherical equivalent (SE) refractive changes with stratification by sex, age, and SE in 593,273 eyes from Japanese individuals ages 3–91 years. The 5-year SE change with myopic shift dramatically increased over time after age 4 years, and the largest change was observed in both males and females who were age 8 years at baseline [males: − 2.654 ± 0.048 diopters (D); females: − 3.110 ± 0.038 D]. During school age, the 5-year myopic change was greater in females than in males, and emmetropic and low-to-moderate myopic eyes underwent larger myopic changes than hyperopic and high-to-severe myopic eyes. After the peak at age 8 years, the 5-year myopic change gradually declined with age and fell below − 0.25 D at age 27 in males and age 26 years in females. The 5-year SE changes transitioned from a myopic to a hyperopic shift at age 51 in both sexes, and hyperopization advanced more quickly in hyperopic eyes. Our findings highlight the importance of myopia prevention in school-aged children.



593,273 eyes from Japanese individuals ages 3–91 years. The 5-year SE change with myopic shift dramatically increased over time after age 4 years, and the largest change was observed in both males and females who were age 8 years at baseline [males: − 2.654 ± 0.048 diopters (D); females: − 3.110 ± 0.038 D]. During school age, the 5-year myopic change was greater in females than in males, and emmetropic and low-to-moderate myopic eyes underwent larger myopic changes than hyperopic and high-to-severe myopic eyes. After the peak at age 8 years, the 5-year myopic change gradually declined with age and fell below − 0.25 D at age 27 in males and age 26 years in females. The 5-year SE

Zeitpunkt des Ausstiegs

OPO OPHTHALMIC & PHYSIOLOGICAL OPTICS
THE JOURNAL OF THE COLLEGE OF OPTOMETRISTS
Ophthalmic and Physiological Optics ISSN 0275-5408

Longitudinal analysis of axial length growth in a German cohort of healthy children and adolescents

Carolin Truckenbrod[1], Christof Meigen[1], Manuela Brandt[1], Mandy Vogel[1], Pablo Sanz Diez[2,3], Siegfried Wahl[2,3], Anne Jurkutat[1] and Wieland Kiess[1,4,5]

[1]Leipzig Research Center for Civilization Diseases (LIFE), Leipzig University, Leipzig, Germany, [2]Institute for Ophthalmic Research, Eberhard Karls University Tuebingen, Tuebingen, Germany, [3]Carl Zeiss Vision International GmbH, Aalen, Germany, [4]Department of Women and Child Health, University Hospital for Children and Adolescents and Center for Pediatric Research, Leipzig University, Leipzig, Germany, and [5]Center for Pediatric Research, Leipzig University, Leipzig, Germany

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Table 2. 2nd, 25th, 50th, 75th and 98th centiles of axial length of children aged 6, 9, 12 and 15 years in China and Europe

		Female			Male		
	Percentile	LIFE Child Germany	Tideman *et al.*[9] Europe	Sanz Diez *et al.*[8] China	LIFE Child Germany	Tideman *et al.*[9] Europe	Sanz Diez *et al.*[8] China
6 years	2	20.76	–	20.97	21.08	–	21.44
	25	21.6	21.66	22.03	22.13	22.14	22.55
	50	22.00	22.06	22.54	22.61	22.59	22.99
	75	22.39	22.49	23.04	23.08	23.01	23.50
	98	23.16	–	24.07	24.00	–	25.00
9 years	2	21.21	–	21.86	21.53	–	22.21
	25	22.14	22.33	23.16	22.59	22.83	23.70
	50	22.59	22.79	23.72	23.10	23.31	24.32
	75	23.04	23.25	24.31	23.61	23.79	24.89
	98	23.97	–	25.55	24.65	–	25.96
12 years	2	21.48	–	22.24	21.83	–	22.86
	25	22.48	–	23.57	22.90	–	24.21
	50	22.99	–	24.16	23.44	–	24.83
	75	23.51	–	24.76	24.00	–	25.44
	98	24.64	–	26.13	25.17	–	26.70
15 years	2	21.57	–	22.45	21.99	–	22.76
	25	22.63	22.68	23.83	23.06	23.17	24.39
	50	23.19	23.15	24.37	23.63	23.65	25.01
	75	23.8	23.65	25.20	24.23	24.21	25.80
	98	25.18	–	27.32	25.57	–	27.78

Data from Europe comprise findings from the present study (LIFE child) as well as the results of Tideman *et al.* (countries: The Netherlands and UK).[9] Data from China are from Sanz Diez *et al.* (Wuhan, China).[8]

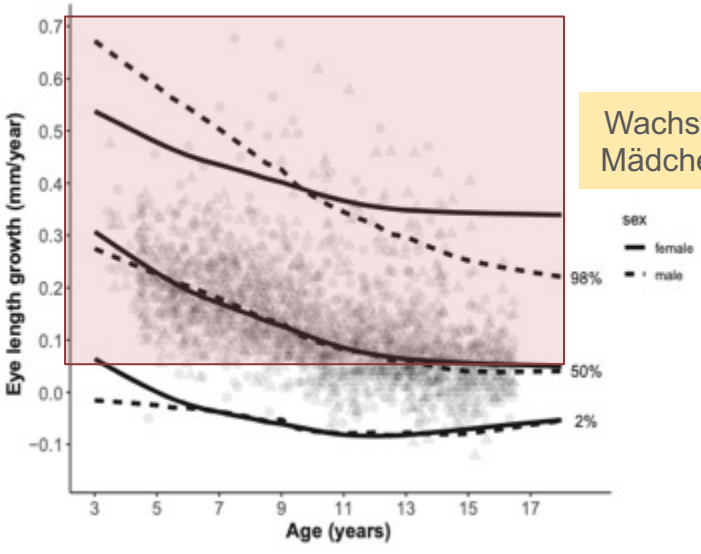

Figure 1. Annual axial length (AL) change in longitudinal data from the LIFE Child Study for girls (solid lines) and boys (dashed lines).

Wachstumsphase
Mädchen > Buben

AXL Stabilisierung bei Emmetropen ab 15/16 Jahren,
bei Myopen nicht vor 18 Jahren.

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Zeitpunkt des Ausstiegs

Contact Lens and Anterior Eye 40 (2017) 82–87

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journal homepage: www.elsevier.com/locate/clae

Discontinuation of orthokeratology on eyeball elongation (DOEE)

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School of Optometry, The Hong Kong Polytechnic University, Hong Kong SAR, China

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ABSTRACT

Purpose: To evaluate and compare changes in axial elongation, over a 14-month period, in subjects who discontinued and then resumed ortho-k lens wear with those who continued to wear their lenses or spectacles following a 2-year myopia control study.

Method: This single masked, prospective study recruited subjects who had just completed a 2-year myopia control study. Ortho-k subjects were classified as Group OKc, in which subjects continued ortho-k lens wear for the duration of the study; or Group OKd in which subjects discontinued lens wear for seven months and wore single-vision spectacles (Phase I) and then resumed ortho-k lens wear for another seven months (Phase II). Spectacle-wearing control subjects from the initial myopia control study continued wearing spectacles as control subjects. Axial lengths were measured at scheduled visits using the IOLMaster.

Results: Thirteen, 16, and 15 Control, OKc, and OKd subjects, aged 8–14 years, respectively completed the study. Significant increase in axial elongation was found in OKd subjects only in Phase I but not in Phase II. On resuming lens wear, in Phase II, the rate of axial elongation was no longer significantly different from those of the Control or OKc subjects.

Conclusion: Stopping ortho-k lens wear at or before the age of 14 years led to a more rapid increase in axial length; comparable to those wearing spectacles during the initial 2-year myopia control study, but greater than the Control and OKc group in this study. Axial elongation slowed again with resumed lens wear after six months.

"Rebound" !

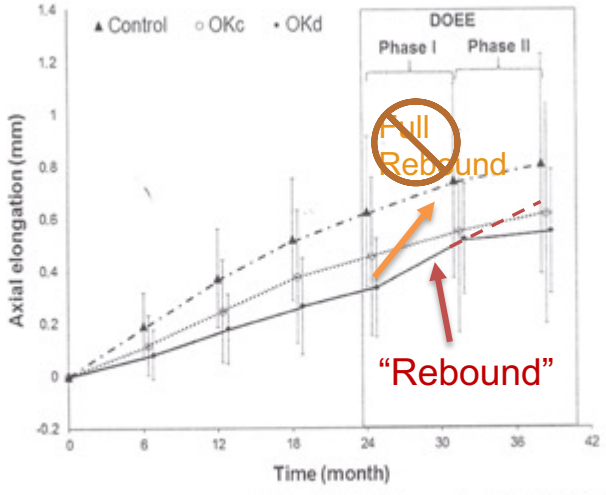

Fig. 2. Axial elongation of the subjects at each visit, including data (retrospective) from subjects' initial 2-year myopia control study. Control – continued to wear single vision spectacles in both Phases of the study; OKc – continued to wear orthokeratology lenses in both Phases of the study; OKd – ceased orthokeratology lens wear for 6 months (Phase I) and then resumed lens wear in Phase II.
Data collection visits for the three groups of subjects were the same but data points shown in the graph are staggered to allow easier view of the error bar. Each error bar represents one standard deviation.

Vorsicht vor teilweisem „Rebound“ !
6-monatige Biometrie Nachkontrollen nach
Absetzten des Myopie Managements unerlässlich

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Myopie Management Pharmazie

Rebound Effekt bei Atropin

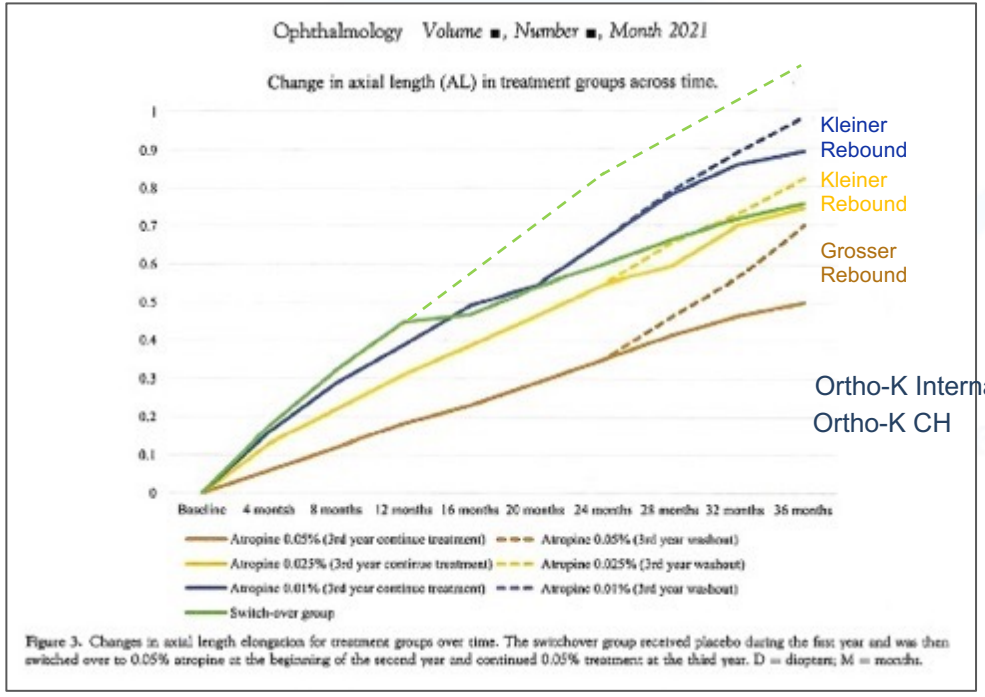
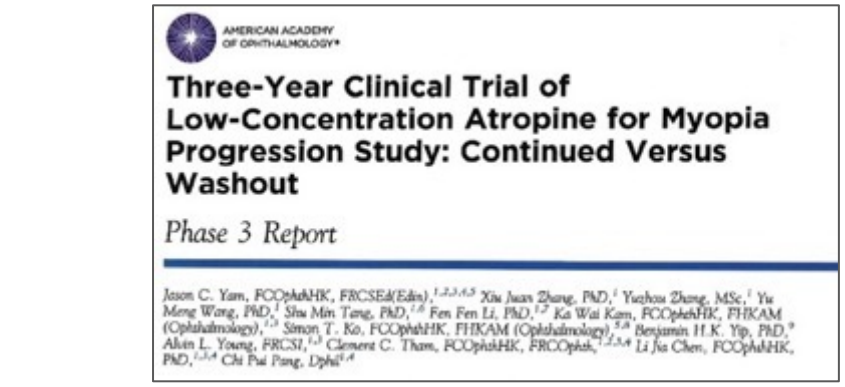


Figure 3. Changes in axial length elongation for treatment groups over time. The switchover group received placebo during the first year and was then switched over to 0.05% atropine at the beginning of the second year and continued 0.05% treatment at the third year. D = diopters; M = months.


AMERICAN ACADEMY OF OPHTHALMOLOGY

Three-Year Clinical Trial of Low-Concentration Atropine for Myopia Progression Study: Continued Versus Washout

Phase 3 Report

Jason C. Yam, FCOphthHK, FRCSEd(Edin),[1,2,3,4,5] Xiu Juan Zhang, PhD,[1] Yuzhou Zhang, MSc,[1] Yu Meng Wang, PhD,[1] Shu Min Tang, PhD,[1,6] Fen Fen Li, PhD,[1,7] Ka Wai Kam, FCOphthHK, FHKAM (Ophthalmology),[1,3] Simon T. Ko, FCOphthHK, FHKAM (Ophthalmology),[5,8] Benjamin H.K. Yip, PhD,[9] Alvin L. Young, FRCSI,[1,3] Clement C. Tham, FCOphthHK, FRCOphth,[1,2,3,4] Li Jia Chen, FCOphthHK, PhD,[1,3,4] Chi Pui Pang, DPhil[1,4]

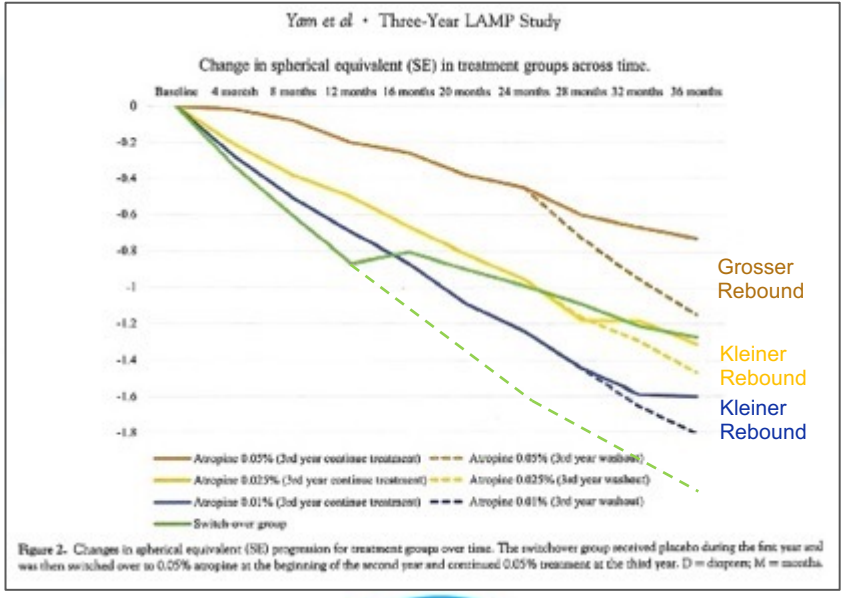


Figure 2. Changes in spherical equivalent (SE) progression for treatment groups over time. The switchover group received placebo during the first year and was then switched over to 0.05% atropine at the beginning of the second year and continued 0.05% treatment at the third year. D = diopters; M = months.

Adaptation zu Plan B statt Rebound !

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Ausstiegs-Strategie

Strategie-Empfehlung Michael Bärtschi *(Stand Sommer 2022):*

Nicht vor 16/18 Jahren*, und dann auch nur wenn :

- refraktive und axiale Daten mind. 2 Jahre stabil innerhalb des alterskorrelierten natürlichen Wachstums geblieben sind
- das aktuelle Risikoprofil gering-mittel ist und
- die AXL der Jugendlichen weiterhin unter 26mm/25.5mm liegt.

Schrittweise Reduktion der Dosierung (Defokus oder %) unter kontinuierlicher Kontrolle der Myopie und der AXL alle 12 Monate.

* Holländische und australische Wachstumskurven

Zusammenfassung

- Risiko Profil und Wachstumskurven sind exzellente Entscheidungshilfen und Kommunikationshilfen. Sie sind die Basis für die Langzeit Betreuung.
- Keine Methode ist für sich alleine genügend für alle Fälle und alle Bedürfnisse/Ansprüche.
- Alle drei Säulen (Prävention, Atropin, Peripher Defokus KL/Gläser) sind langjährig klinisch und Evidenz erprobt und auf der ganzen Welt empfohlen.
- Therapie Erfolgsraten von 50%+ sind Langzeit bestätigt. -> AMMC !
- Wähle eine dem Risikoprofil, den Fähigkeiten und den Bedürfnissen des Kindes angepasste Therapie aus *(z.B. Alter, aktuelle Myopie und Progressionsrate, aktuelle Sehbedürfnisse, Naharbeit und Hobby, usw)*.
- Neuer Goldstandart zur Bestätigung des Therapie Erfolgs ist die axiale Bulbuslänge (Biometrie).

Take Home

- Methoden zur Hemmung der Myopie sind verfügbar und empfohlen.
- Agiere früh, mutig, effektiv und konsequent !
- Informiere neutral und Evidenz basiert.
- Die erfolgreichste Therapie wächst mit dem Kind und passt sich ihm an.
- **Adaptiere und kombiniere die Therapie Strategie über Zeit.**
- Synergistische Kooperation von Ophthalmologen und Optometristen sind für den Erfolg eminent und für alle Beteiligten sinnvoll.

MiSight Banner