White papers of the International Myopia Institute

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Disclosures

- IMI is a non-profit project of EHVI
- IMI has its own independent advisory board and taskforce members that volunteer their time

FOUNDER

PLATINUM

GOLD

SILVER

Speaker's name : James S. Wolffsohn

☑ I have the following potential conflicts of interest to report:

- Chief Scientific Officer of the International Myopia Institute, on the Executive of the Tear Film and Ocular Surface Society and Academic Chair to the BCLA.
- Honoraria for consultancy received from AtiaVision, Bausch and Lomb, Alcon, CooperVision, Johnson and Johnson Vision, Nevakar, Novartis and Thea Pharmaceutical.
- Research funding from Alcon, Allergan, Johnson and Johnson Vision, Novartis, M2C Therapeutics, Rayner and Thea Pharmaceuticals.
- Founder and shareholder in Aston Vision Sciences, Eyoto and Wolffsohn Research Ltd

WHO-BHVI MEETING SYDNEY MARCH ‘15

Back Row: Dr. Hasan Mirza (EMRO), Dr. Rhea Tsai (E-WPRO), Prof. Gad Medin (AMRO), Dr. David Wilkie, Prof. Rasoo Naidoo (AFRO), Mr. Tom Frieden, Prof. Jod R. Jonas (EURO), Assoc. Prof. Padmaja Sankaridurg.

Second Back Row: Prof. Tien Yin Wong (WPRO), Prof. Ashbo Al Yatim (EMRO), Prof. Salim Kodle (AFRO), Prof. Serge Resnikoff (EURO), Prof. Rolang Zhao, Prof. Ian Morgan, Prof. Olavi Pärssinen, Prof. Mingguang He (WPRO), Dr Susan Vitale (AMRO).

Front Row: Prof. Kyoko Ono-Mura (WPRO), Prof Seang Mei Saw (WPRO), Dr. Ivo Kocur (AMRO), Prof. Brien Holden, Dr. Silvio Paolo Mariotti (WHO), Dr. Solange Salas Cruz (AMRO), Dr. Adriana Berezovsky, Dr. Monica Jong.

ADVISORY BOARD OF EXPERTS

Prof Serge Resnikoff
Chair

Professor
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Professor
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Earl L. Smith III

Professor
Mingguang He

Chief Scientist
Professor
James S. Wolffsohn

Professor
Padmaja Sankaridurg

“Every diopter of myopia increases the risk of vision impairment and blindness.

There is evidence to prevent myopia and slow its progression.

(World Health Organisation 2015; IMI white papers 2019, 2021)”

OVERALL AIMS

- To **investigate, understand** and **collect evidence** regarding the worldwide epidemic of myopia and related refractive errors.
- To **build consensus** on the current understanding of myopia.
- To **investigate, develop and make available evidence** on possible solutions to the direct and indirect effects of myopia on world vision impairment and blindness.
- To **make aware, educate and advocate** to people, Governments, professionals, teachers, children and parents, and society in general, as to the evidence on the nature of the adverse influence of myopia on health, education, and the social and economic welfare of individuals and society.
- To **provide guidance and resources** accessible to policy makers, governments, councils, and societal and educational bodies, as to the evidence on the influence of myopia on health, education, and the social and economic welfare of individuals and society that ultimately help in the implementation of appropriate programs to manage myopia.

The first IMI session at the International Myopia Conference, Aston University, UK, Sep 2017

L to R: James Wolffsohn, David Troilo, Lyndon Jones, Kovin Naidoo, Monica Jong, Earl Smith, Christine Wildsoet, Chris Hammond, Kate Gifford, Ian Flitcroft

IMI Activities

Jul 2015
IMI & advisory board established

May 2017
- All committees established
- Website established

Sep 2017
IMI session, 16th IMC, Aston University;
400 attendees

Nov 2018
- IMI white papers preview session, AAOptom, San Antonio;
- 300 attendees

Jan 2019

Apr 2019
- IMI session, ARVO, Vancouver;
- 300 attendees;
- New taskforces initiated

Jun 2019

Oct 2019
Clinical summaries of white papers, podcasts

Sep 2019
- IMI session Phase 2, 17th IMC, Tokyo Medical & Dental University
- **NEW TASKFORCES** initiated!

Apr 2021

Jul 2021

Infographics

Mar 2022
- Launch of global practitioner survey
- **NEW TASKFORCES** initiated!

Sep 2022
- IMI session, 18th IMC, Rotterdam;
- IMI F2F meeting/workshop
- IMI ambassador catch up session

IMI today

14 taskforces

138 taskforce members

1,600 general members

Accommodation and Binocular Vision in Myopia Development and Progression

Dr. Nicola S. Logan (Leader)

Committee Members:

- Dr. Hema Radhakrishnan
- Dr. Fiona Cruickshank
- Prof. Peter M. Allen
- Mr. Praveen K. Bandela
- Prof. Leon N. Davies
- Prof. Satoshi Hasebe
- Dr. Safal Khanal
- Assoc. Prof. Katrina Schmid
- Dr. [illegible] Vera-Diaz
- Prof. James S. Wolffsohn

Risk Factors in Myopia

Prof. Ian Morgan (Leader)

Committee Members:

- Dr. [illegible] French
- Dr. Jan W.L. Tideman
- Prof. Rigmor Baraas
- Prof. Weizhong Lan
- Prof. Padmaja Sankaridurg
- Assoc. Prof. Pei-Chang Wu
- Prof. Seang Mei Saw
- Prof. Kathryn A. Rose
- Prof. Jez Guggenheim
- Assoc. Prof. Jason Yam
- Dr. Xiangui (Hedy) He
- Dr. [illegible]

Impact of Myopia

Prof. Padmaja Sankaridurg (Leader)

Committee Members:

- Dr. Nina Tahhan
- Dr. Himal Kandel
- Mr. Thomas Naduvilath
- Dr. Haidong Zhou
- Prof. Kevin D. Frick
- Dr. [illegible]
- Prof. [illegible]
- Prof. [illegible]
- Prof. [illegible]
- Prof. [illegible]
- Mr. [illegible]
- Dr. [illegible]
- Prof. [illegible]

Pathologic myopia

Prof. Kyoko Ohno-Matsui (Leader)

Committee Members:

- Prof. Pei-Chang Wu
- Dr. Kenji Yamashiro
- Mr. Kritchai Vutipongsatorn
- Ms. Yuxin Fang
- Prof. Chui Ming Gemmy

Prevention of Myopia and its Progression

Prof. Jost B. Jonas (Leader)

Committee Members:

- Assoc. Prof. Marcus Ang
- Prof. [illegible]
- Prof. Jeremy A. Guggenheim
- Prof. Ming Guang He
- Dr. Monica Jong
- Dr. Nicola S. Logan
- Assoc. Prof. [illegible]
- Prof. [illegible]
- Prof. Kyoko Ohno-Matsui
- Adjunct. Prof. Olavi Pärssinen
- Prof. Serge Resnikoff
- Prof. Padmaja Sankaridurg
- Dr. Seang Mei Saw
- Prof. [illegible] Smith III
- Prof. Donald T. H. Tan
- Prof. Jeffrey J. Walline
- Prof. Christine F. Wildsoet
- Prof. James S. Wolffsohn
- Prof. Pei-Chang Wu
- Dr. [illegible]

IMI 2021 Yearly Digest

Dr. Monica Jong (Leader)
Prof. [illegible] Smith III (Co-leader)

Committee Members:

- Prof. James S. Wolffsohn
- Prof. Daniel I. Flitcroft
- Assoc. Prof. David A. Berntsen
- Ms. Danielle Clarkson-Townsend
- Prof. Machelle T. Pardue
- Prof. Christine Wildsoet
- Prof. Pauline Cho
- Prof. Padmaja Sankaridurg
- Assoc. Prof. Kathryn J. Richdale
- Dr. Kate L. Gifford
- Prof. Lisa A. Jones
- Prof. Caroline Klaver
- Prof. Virginie Verhoeven
- Dr. Annechien Haarman
- [illegible]

Dr Kate Gifford (Leader)

Committee Members:

- Dr. Langis Michaud
- Dr. Tom Aller
- Dr. Pauline Kang
- Dr. Kathryn Richdale
- Prof. Carly Lam
- Mr. Jeroen Mulder
- Dr. Dirk Seidel
- Dr. Kathryn Saunders
- Dr. Maria Liu
- Dr. Willem Tideman
- Dr. Janis Orr
- Prof. Kathy Rose

Prof. Earl Smith and David Troilo (Leaders)

Committee Members:

- Prof. David Troilo
- Prof. Siegfried Wahl
- Dr. [illegible]
- Dr. Kitty Chaska
- Dr. Tim Gawne
- Dr. Andrei Tkatchenko
- Prof. Machelle Pardue
- Dr. Regan Ashby
- Dr. [illegible] Nickla
- Dr. Jody Summers
- Dr. Falk Schroedl

Committee Members:

- Dr. [illegible]
- Pro[illegible]
- Dr. [illegible]
- Dr. [illegible]
- Dr. [illegible]
- Dr. [illegible]
- Pro[illegible]
- Pro[illegible]
- CRI[illegible]

IMI White Papers 2019

	IMI reports	Chair
1	Defining and classifying myopia	Mr Ian Flitcroft (Dublin)
2	Interventions for myopia control	Prof Christine Wildsoet (Berkeley)
3	Clinical trials and instrumentation	Prof James Wolffsohn (Aston)
4	Industry guidelines and ethical considerations	Prof Lyndon Jones (Waterloo)
5	Clinical management guidelines	Dr Kate Gifford (QUT)
6	Experimental models of emmetropization and myopia	Profs Earl Smith (Houston) & David Troilo (SUNY)
7	Genetics of Myopia	Prof Caroline Klaver (Erasmus)


Ian Flitcroft


Christine Wildsoet


James Wolffsohn


Lyndon Jones


Kate Gifford


Earl Smith


David Troilo

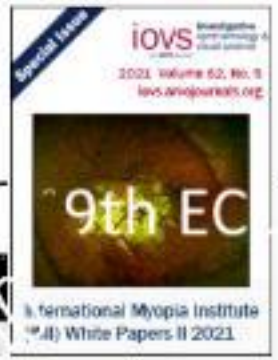

Caroline Klaver

IMI white papers II 2021

Padmaja Sankaridurg

James Wolffsohn

Kyoko Ohno-Matsui



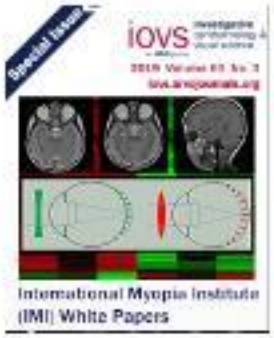
Taskforce	Chair
1. IMI 2021 Reports and Digest - Reflections on the Implications for Clinical Practice	Prof James Wolffsohn
2. IMI Impact of myopia	Prof Padmaja Sankaridurg (Australia)
3. IMI Environmental risk factors in myopia	Prof Ian Morgan (Australia)
4. IMI Accommodation and binocular vision in myopia	Dr Nicola Logan (UK)
5. IMI Pathologic myopia	Prof Kyoko Ohno-Matsui (Japan)
6. IMI Prevention and progression of myopia	Prof Jost Jonas (Germany)
7. IMI Yearly Digest 2021	Prof Earl Smith (USA) and Dr Monica Jong (Australia)

Jost Jonas

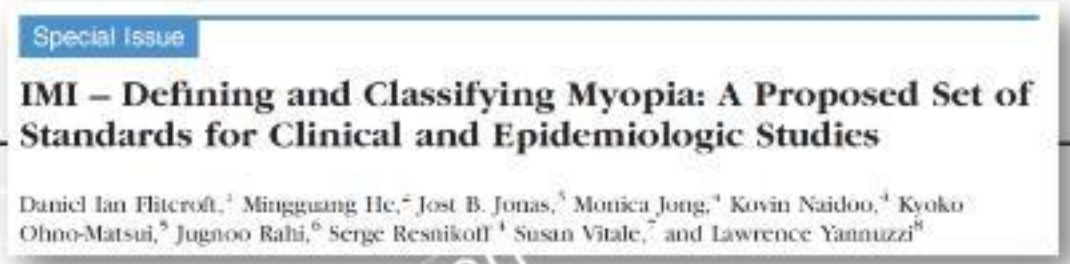
Ian Morgan

Nicola Logan

White papers, clinical summaries and reports online



Definitions


Special Issue

IMI – Defining and Classifying Myopia: A Proposed Set of Standards for Clinical and Epidemiologic Studies

Daniel Ian Flitcroft,[1] Mingguang He,[2] Jost B. Jonas,[3] Monica Jong,[4] Kovin Naidoo,[4] Kyoko Ohno-Matsui,[5] Jugnoo Rahi,[6] Serge Resnikoff,[4] Susan Vitale,[7] and Lawrence Yannuzzi[8]

- Myopia: a condition in which the spherical equivalent refractive error of an eye is <-0.5 D when ocular accommodation is relaxed.
- Low Myopia: a condition in which the spherical equivalent refractive error of an eye is ≤-0.5 and >-6.00 D when ocular accommodation is relaxed.
- High Myopia: a condition in which the spherical equivalent refractive error of an eye is <-6.00 D when ocular accommodation is relaxed.
- Pre-myopia – a refractive state of an eye of 0.75 D and >-0.50 D in children where a combination of baseline refraction, age, and other quantifiable risk factors provide a sufficient likelihood of the future development of myopia to merit preventative interventions.
- Pathologic Myopia: excessive axial elongation associated with myopia that leads to structural changes in the posterior segment of the eye (including posterior staphyloma, myopic maculopathy, and high myopia-associated optic neuropathy) and that can lead to loss of best corrected visual acuity.

Clinical management guidelines

Clinical Tests

All visits
- Appropriate history taking relative to treatment
- Distance and near VA
- Subjective and/or objective refraction
- Accommodative and binocular vision assessment
- Ocular health examination

Annually (or on indication)
- Cycloplegic refraction
- Dilated fundus examination

If Available

- Axial length measurement (every 6 months)

Treatment Specific

Atropine
- Pupil size and function
- IOP

Orthokeratology
- Corneal topography

Special Issue

IMI – Clinical Management Guidelines Report

Kate L. Gifford,[1] Kathryn Richdale,[2] Pauline Kang,[3] Thomas A. Aller,[4] Carly S. Lam,[5] Y. Maria Liu,[6] Langis Michaud,[7] Karen Scheiber[8] Janis B. Orr,[9] Kathryn A. Rose,[10] Kathryn J. Saunders,[11] Dirk Seidel,[12] J. Willem L. Tabbenor,[13] and Padmaja Sankaridurg[14]

Review schedule

Atropine
- 4-7 days
- 1 month
- 3 months
- then 6 monthly

Orthokeratology
- 1 day
- 4-7 days
- 1 month
- 3 months
- then 6 monthly

Multifocal SCLs
- 4-7 days
- 1 month
- then 6 monthly

PAL/Bifocal Specs
- 1 month
- then 6 monthly

Interventions

Special Issue

IMI – Interventions for Controlling Myopia Onset and Progression Report

Christine F. Wildsoet,[1] Audrey Chia,[2] Pauline Cho,[3] Jeremy A. Gug
Polling,[5,6] Scott Read,[7] Padmaja Sankaridurg,[8] Seang-Mei Saw,[9] Klau
Pei-Chang Wu,[12] and James S. Wolffsohn[13]

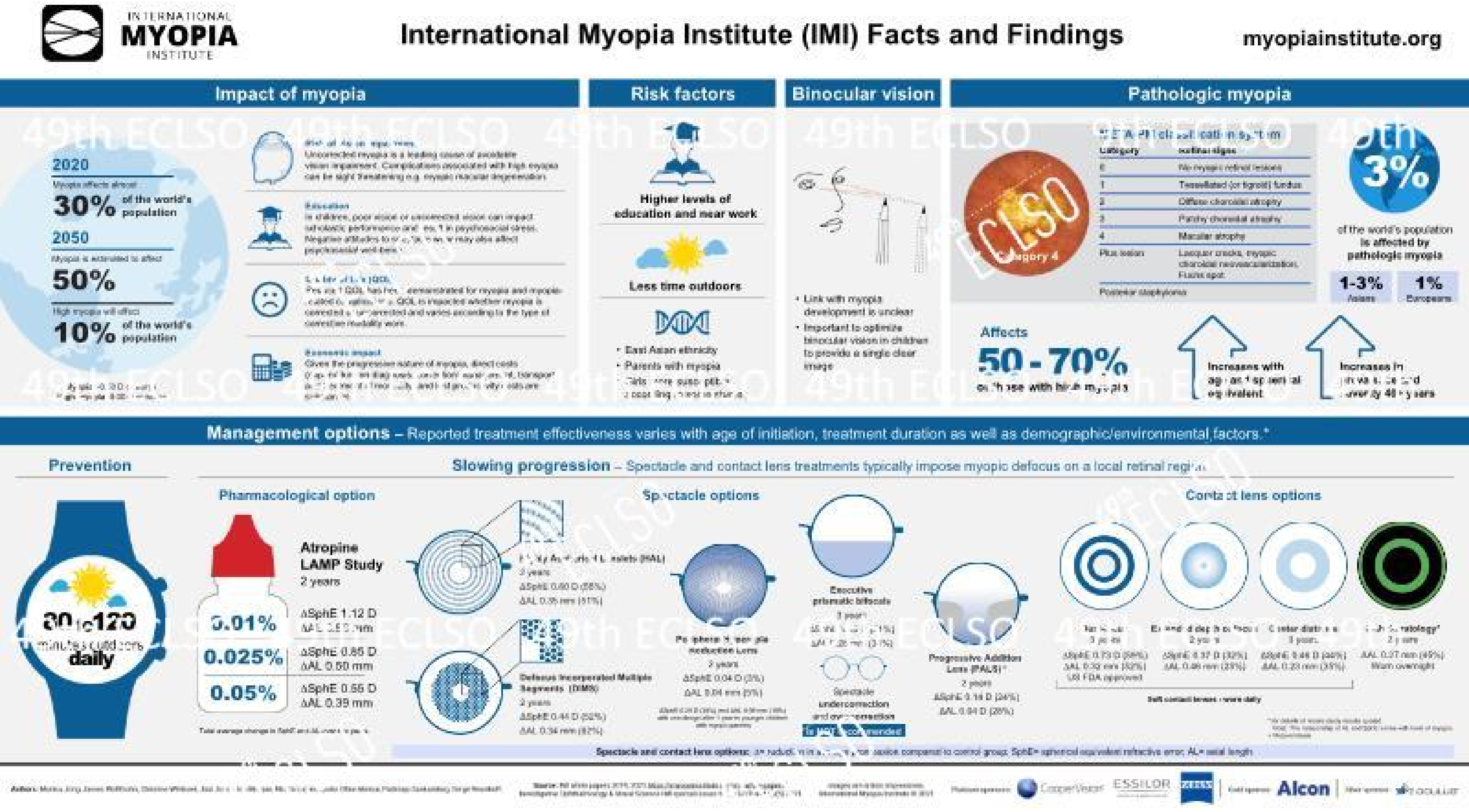
Special Issue

IMI – Clinical Myopia Control Trials and Instrumentation Report

James S. Wolffsohn,[1] Peter S. Kollbaum,[2] David A. Berntsen,[3] David A. Atchison,[4] Alexandra Benavente,[5] Arthur Bradley,[6] Leon Buckhurst,[5] Michael Collins,[4] Takashi Fujikado,[7] Takahiro Hiraoka,[8] Masakazu Hirota,[7] Debbie Jones,[9] Nicola S. Logan,[1] Linda Lundström,[10] Hidemasa Torii,[11] Scott A. Read,[1] and Kovin Naidoo[12]

TABLE 5. Expected Minimum Data Set for Each Treatment Modality

Treatment Modality	Distance Visual Acuity	Near Visual Acuity	Pupil Size	Cycloplegic Refraction	Axial Length	Amplitude of Accommodation	Contrast Sensitivity	Lens Centration	Wearing Time	Instillation Compliance
Spectacles	X	X	X	X	X	X	X	—	X	—
Soft multifocal contact lenses	X	X	X	X	X	X	X	X	X	—
Orthokeratology	X	X	X	X	X	X	X	X	X	—
Pharmaceuticals	X	X	X	X	X	X	X	—	—	X



INTERNATIONAL MYOPIA INSTITUTE
International Myopia Institute (IMI) Facts and Findings
myopiainstitute.org
Impact of myopia
2020
30% of the world's population
2050
50%
10% of the world's population
Uncorrected myopia is a leading cause of avoidable vision impairment. Complications associated with high myopia can be sight threatening e.g. myopic macular degeneration.
Risk factors
Higher levels of education and near work
Less time outdoors
East Asian ethnicity
Parents with myopia
Binocular vision
Link with myopia development is unclear
Important to optimize binocular vision in children to provide a single clear image
Pathologic myopia
Category
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%
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
Slowing progression – Spectacle and contact lens treatments typically impose myopic defocus on a local retinal region
Pharmacological option
Atropine LAMP Study
2 years
0.01% ΔSphE 1.12 D
0.025% ΔSphE 0.85 D ΔAL 0.50 mm
0.05% ΔSphE 0.55 D ΔAL 0.39 mm
Spectacle options
Defocus Incorporated Multiple Segments (DIMS)
2 years
ΔSphE 0.44 D (52%)
ΔAL 0.34 mm (62%)
Executive prismatic bifocals
Peripheral Plus Lens
Progressive Addition Lens (PALS)
Spectacle undercorrection
Is NOT recommended
Contact lens options
Soft contact lenses - worn daily
Spectacle and contact lens options

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 academic 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

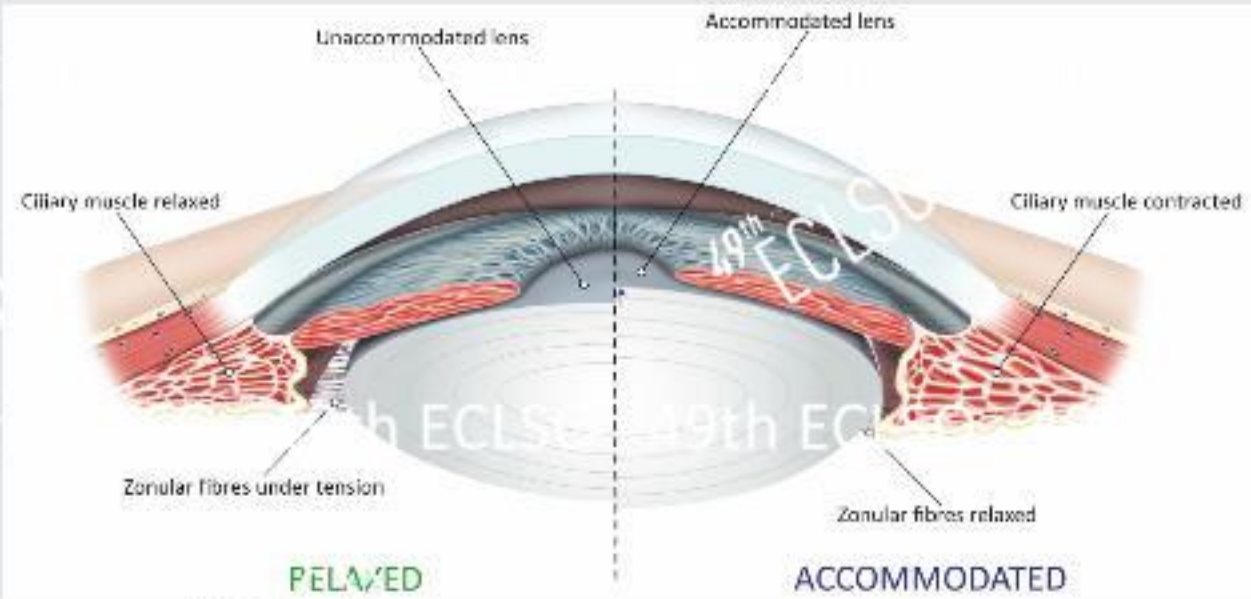
- East Asian ethnicity
- Parents with myopia
- Girls more susceptible according to some studies

Table. Summary of Factors Associated With Myopia

Factor	Evidence/Causal Relationship	Confounding Issues
Major factors		
Education	Strong and causal	Time outdoors
Time outdoors	Strong and causal	Role of light (intensity, duration, spectrum)
Screen time	Equivocal	Nearwork
Basic birth factors		
Sex	Weak	Social factors
Ethnicity	Inconsistent	Cultural attitudes or genetics
Parental myopia	Strong	Genetics or myopiagenic environments
Birth order	Weak	Years of education
Birth season	Weak	Years of education
Other personal factors		
Height	Weak	Social factors
Intelligence	Moderate	Education, time outdoors
Physical activity	Moderate	Time outdoors
Sleep	Weak	Educational pressures
Family characteristics		
Socio-economic status	Moderate	Education
Smoking	Weak	Education, SES
Diet	Weak	Education, SES
Environment		
Urban/rural	Moderate	Education, SES, time outdoors
Pollution	Weak	SES
Housing	Weak	Education, SES
Circadian rhythm	Weak	Dopamine
Night light	Negative	
Light spectrum	Weak	Limited data
Miscellaneous factors		
Allergic conjunctivitis, hay fever, Kawasaki disease, febrile diseases	Weak	Limited data, time outdoors
Fertility treatment	Weak	Limited data
Combined beliefs		
Reading in dim light, under bed clothes or in transport	Weak	Limited data
Posture in reading/writing and holding pen, font size in book	Weak	Limited data

Binocular vision

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



International Myopia Institute (IMI) Facts and Findings

myopiainstitute.org

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 chorioretinal 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

Special Issue

IMI – Clinical Myopia Control Trials and Instrumentation Report

James S. Wolffsohn,[1] Pete S. Kollbaum,[2] David A. Berntsen,[3] David A. Atchison,[4] Alexandra Benavente,[5] Arthur Bradley,[2] Hetal Buckhurst,[6] Michael Collins,[4] Takashi Fujikado,[7] Takahiro Hiraoka,[8] Masakazu Hirota,[7] Debbie Jones,[9] Nicola S. Logan,[1] Linda Lundström,[10] Hidemasa Torii,[11] Scott A. Read,[4] and Kovin Naidoo[12]

Recommendations:

- Integrity
  - Ethics
  - Consent - both guardians and children
  - Adverse event reporting standard
  - Clinical trial registration
- Minimum length 2+1 (untreated) years
- Clear and appropriate inclusion/exclusion)
  - age, spherical equivalent, refractive error, astigmatism, anisometropia &ocular pathology
  - Exclude previously treated
- Randomisation + stratification
- Masked control group
- Masked examiner

Management options

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

Special Issue

IMI Prevention of Myopia and Its Progression

Jost B. Jonas,[1] Marcus Ang,[2,3] Pauline Cho,[4] Jeremy A. Guggenheim,[5] Ming Guang He,[6,7] Monica Jong,[8,9] Nicola S. Logan,[11] Mario Li,[12] Ian Morgan,[13,17] Kyoko Ohno-Matsui,[14] Olavi Pärssinen,[15,16] Serge Resnikoff,[8,9] Padmaja Sankaridurg,[8,9] Seang-Mei Saw,[7,18,23] Earl L. Smith III,[8,19] Donald T. H. Tan,[2,3,18] Jeffrey J. Walline,[20] Christine F. Wildsoet,[12] Pei-Chang Wu,[21] Xiaoying Zhu,[22] and James S. Wolffsohn[11]

Prevention

* for details of recent study results quoted. Note: The relationship of AL, rate, SphE varies with level of myopia

Management options

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

Special Issue

IMI – Interventions for Controlling Myopia Onset and Progression Report

Christine F. Wildsoet,[1] Audrey Chia,[2] Pi-Chao Cho,[3] Gareth A. Guggenheim,[4] Jan Roelof Polling,[5,6] Scott Read,[7] Padmaja Sankaridurg,[8] Seang-Mei Saw,[9] Klaus Trier,[10] Jeffrey J. Walline,[11] Pei-Chang Wu,[12] and James S. Wolffsohn[13]

Slowing progression

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.

* for details of recent study results quoted. Note: The relationship of AL vers. SphE varies with level of myopia.

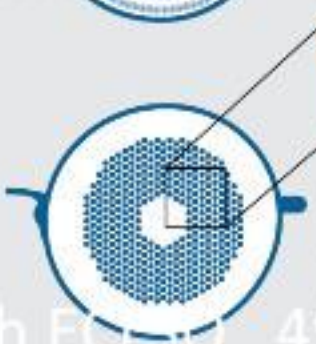
Management options

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

Slowing progression

Spectacle options

Highly Aspherical Lenslets (HAL)
2 years
ΔSphE 0.80 D (55%)
ΔAL 0.33 mm (51%)



Defocus Incorporated Multiple Segments (DIMS)
2 years
ΔSphE 0.44 D (52%)
ΔAL 0.34 mm (51%)

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

ΔSphE 0.29 D (30%) and ΔAL 0.09 mm (18%) with one design after 1 year in younger children with myopic parents

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

Spectacle **undercorrection** and **overcorrection**

NOT recommended

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

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

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

* For details of recent study results quoted. Note: The relationship of AL and SphE versus eff... vs. 4 mo. vs.
+ Meta-analysis

Management options

Expected treatment effectiveness varies with age of initiation, treatment duration as well as demographic/environmental factors.*

Slowing progression

Contact lens options

Dual-focus

3 years

ΔSphE 0.73 D (59%)

ΔAL 0.32 mm (52%)

US FDA approved

Extended depth of focus

2 years

ΔSphE 0.37 D (32%)

ΔAL 0.15 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

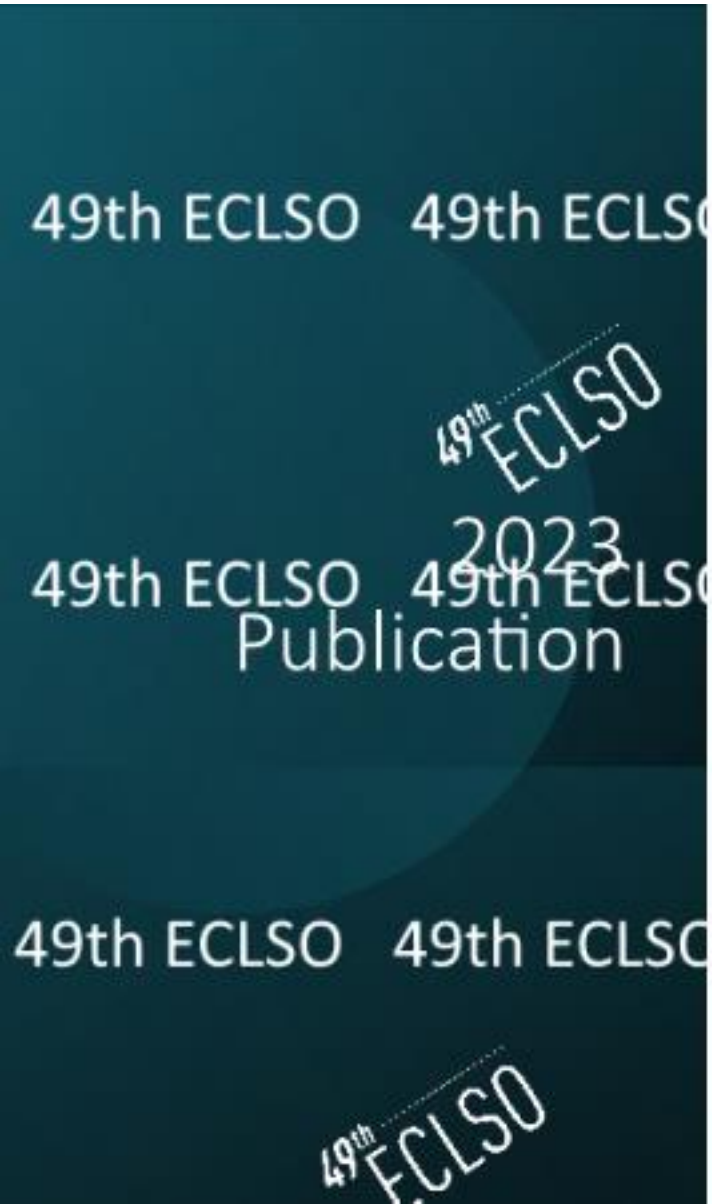
Soft contact lenses - worn daily

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

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

* For details of recent study results quoted. Note: The relationship of AL and SphE versus eff... vs. 4 mo. vs.

+ Meta-analysis



- Prof. Mark Bullimore –
  - **Adult Myopia**
- Prof. Jost Jonas –
  - **Human Ocular Tissue Changes with Axial Myopia**
- Prof. Ian Flitcroft –
  - **Paediatric Myopia**
- Profs Lisa Ostrin & Elise Harb –
  - **Role of Choroid in Eye Growth**
- Prof James Wolffsohn –
  - **Global Practitioner Survey on Myopia Management Uptake**
- Prof Pad Sankaridurg –
  - **2023 Digest**

Other Consideration

Screening for Pre-Myopia

- IMI- "A Rx of an eye of ≤ +0.75 D and >-0.50 D in children where a combination of baseline refraction, age, and other quantifiable risk factors provide a sufficient likelihood of the future development of myopia to merit preventative interventions." Flitcroft et al 2019
- Cycloplegic refraction to avoid misclassification (Zhu et al., 2016), unless assured eye unaccommodated (Gifford et al., 2019; Jong et al., 2021)
- 6yrs Rx <+0.75D; 7-8yrs <+0.50D; 9-10yrs <+0.25D; 11yrs emmetropia (Zadnik et al., 2015)
- 6-8yrs: 1.4/~2.3x 1/2 myopic parents; AC/A ratio ~1.25x; axial length 2.0-2.5x; peripheral Rx 1.4x; BUT Rx alone best predictor (Zadnik et al., 2015)
- 6yrs axial length (>23.07mm OR 2.5x) & 1+ myopic parent (OR 6.3x), Rx <+0.63D most predictive myopia by 16 yrs <+0.63D (McCullough et al., 2020)
- binocular vision status role in myopia unclear (Logan et al., 2021)

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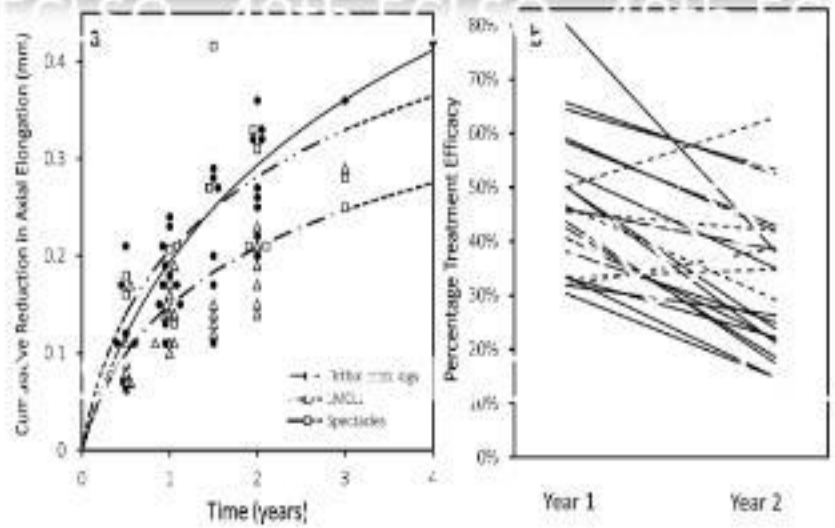
Other Consideration

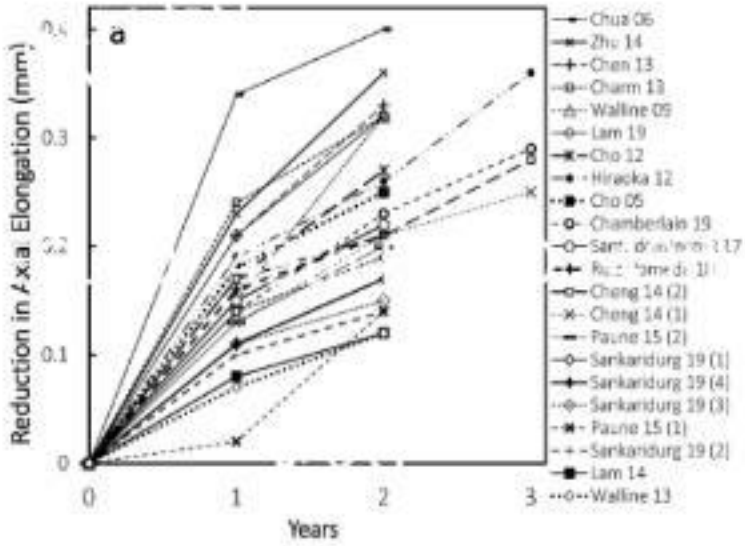
Optimal time to start and stop treatment + rebound effect

- Limited data on when myopia stops progressing
  - Progression noted in young adults (Parssinen et al., 2014) & ~1/3rd adults develop myopia >15yr (Bullimore et al., 2006)
  - Mean age Rx early-onset stabilisation ~16yrs (Goss et al., 1993), but considerable variability
  - Axial length takes longer ~90% by 21yrs (Hou et al., 2018)
- Hence careful monitoring of patients after ceasing treatment prudent
- Clinically significant rebound effect only observed after ceasing higher dose atropine treatment (Chia et al., 2012; Tong et al., 2009) & in orthok with young children (VanderVeen et al., 2019)

Decline in treatment effectiveness with time.

Other Consideration

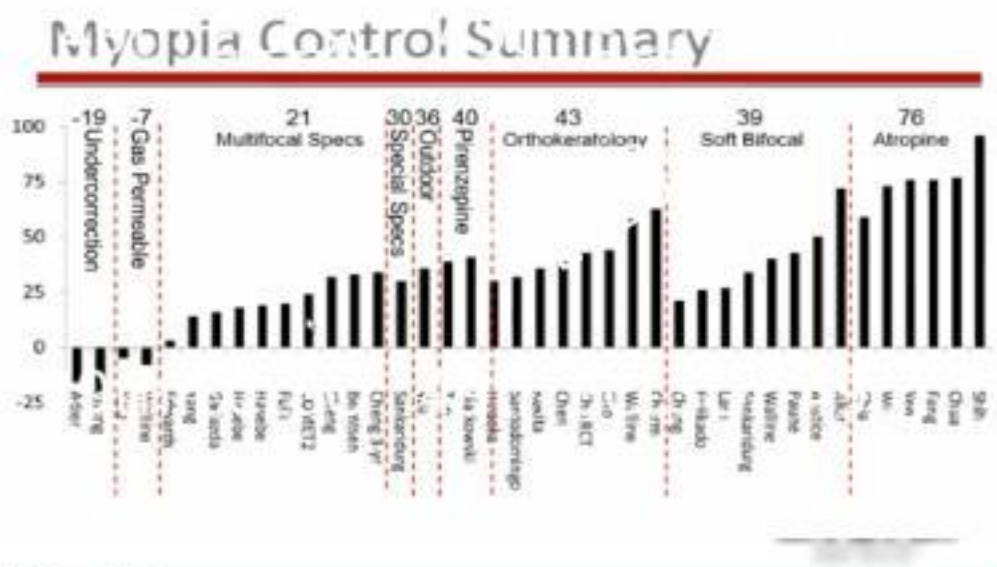




- Combination and sequential treatment

Conclusions

- Emphasis the importance of eye care for children
  - Impact – personalised management
  - Risk factors
  - Pre-myopia
  - Prophylaxis – outdoor time
- Proactive in management
  - Higher progression when younger
  - Availability of treatments – personalised management
  - Monitor and be prepared to refine

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Total n= 2,564

2022 Update

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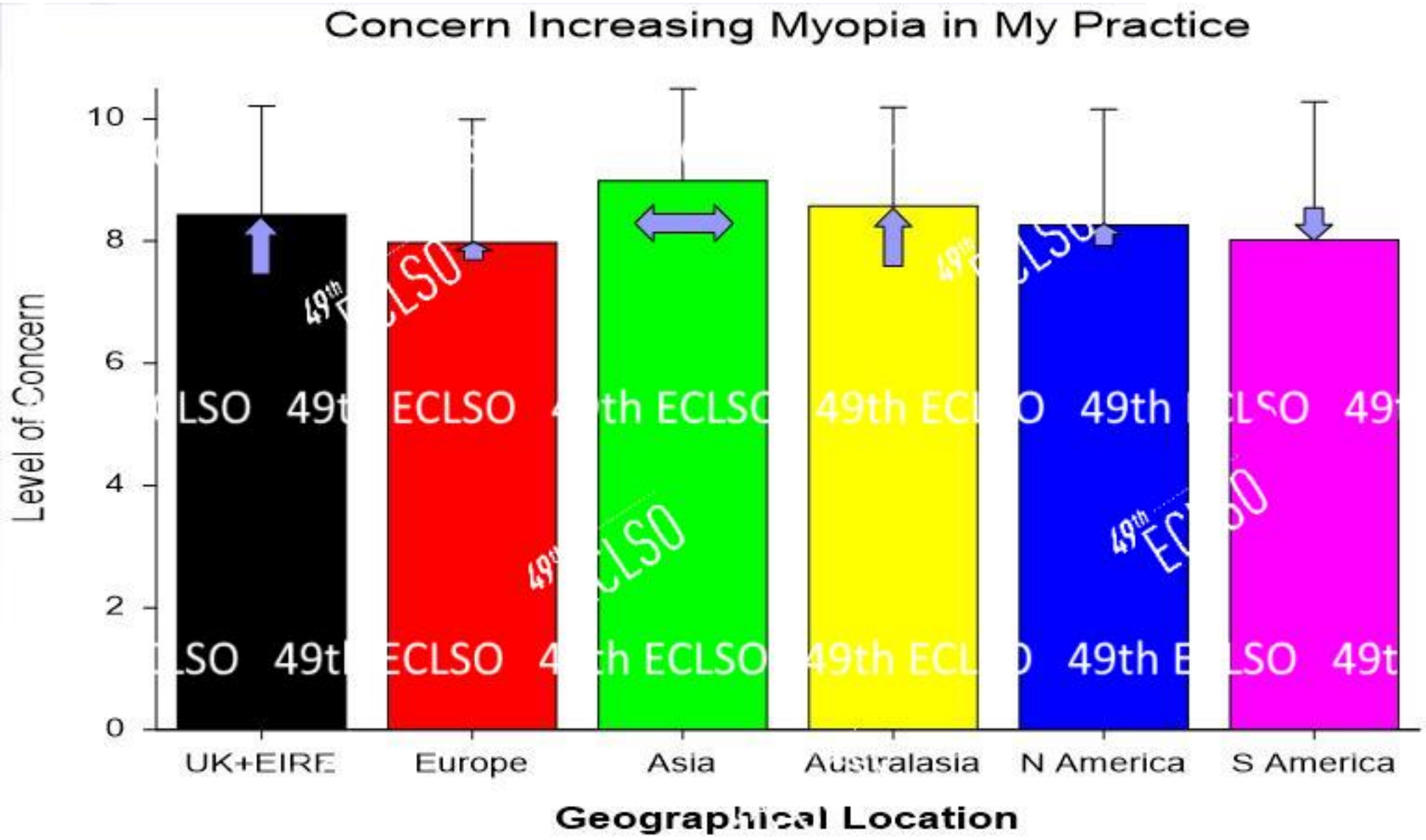
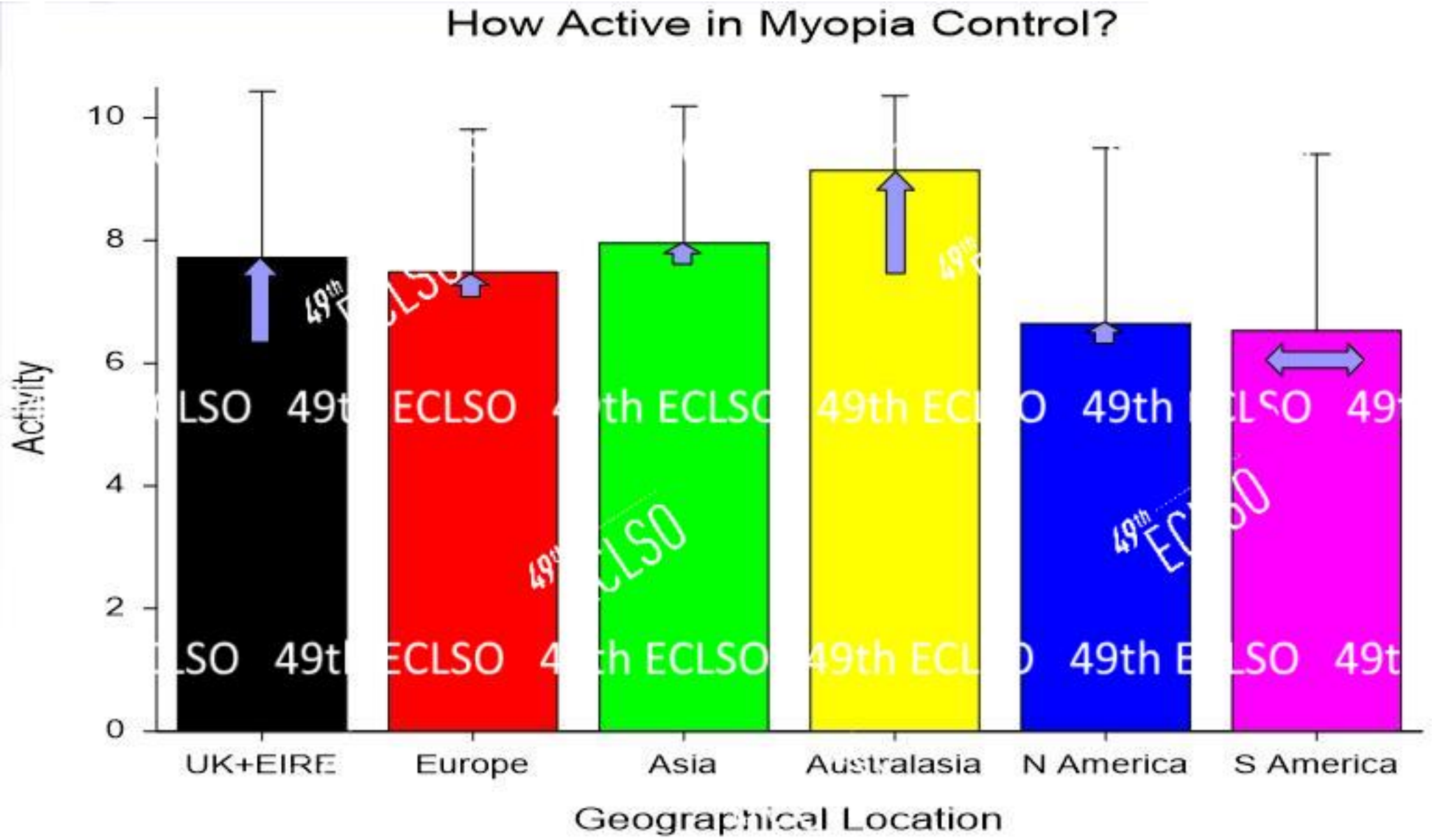
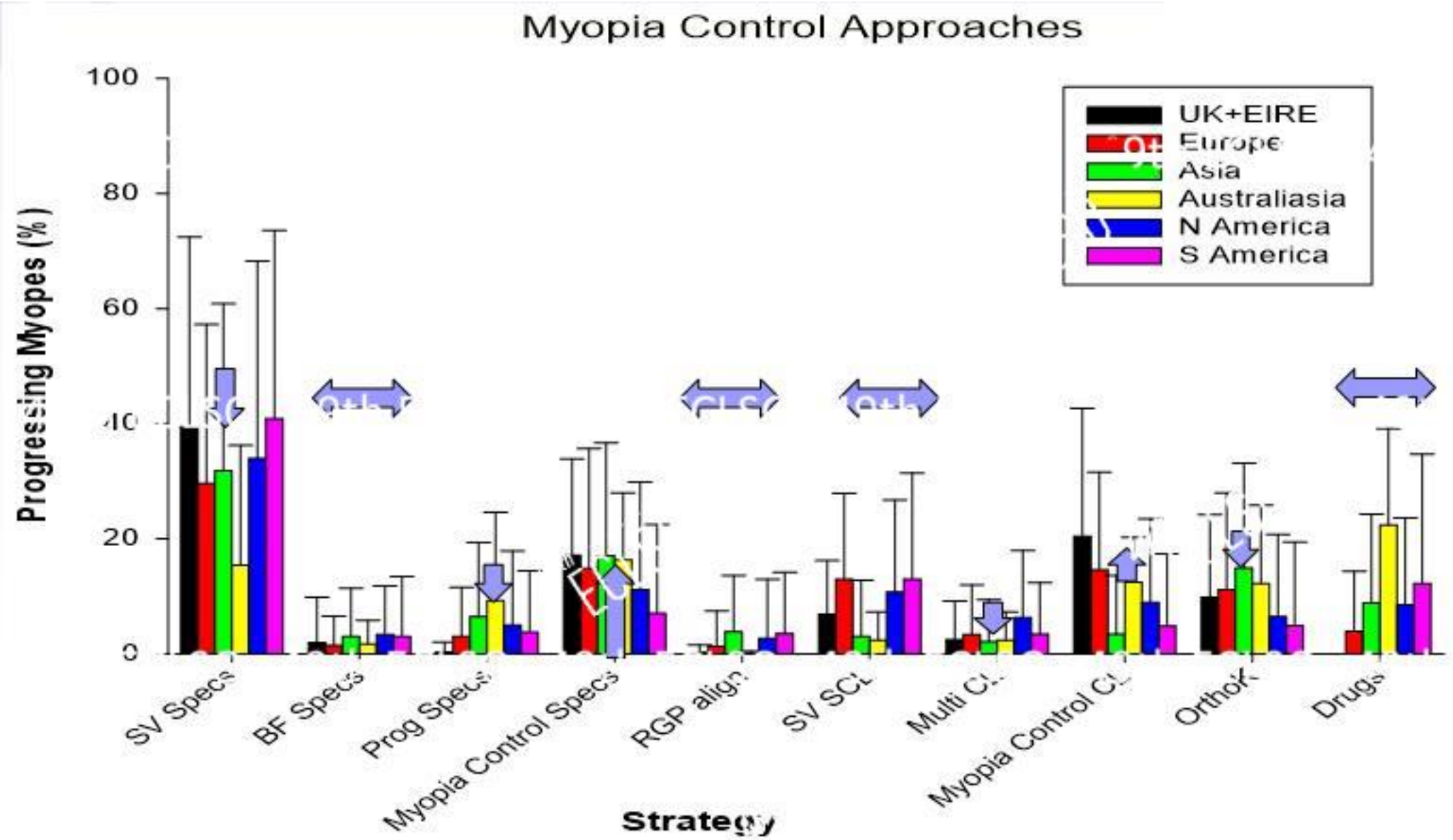
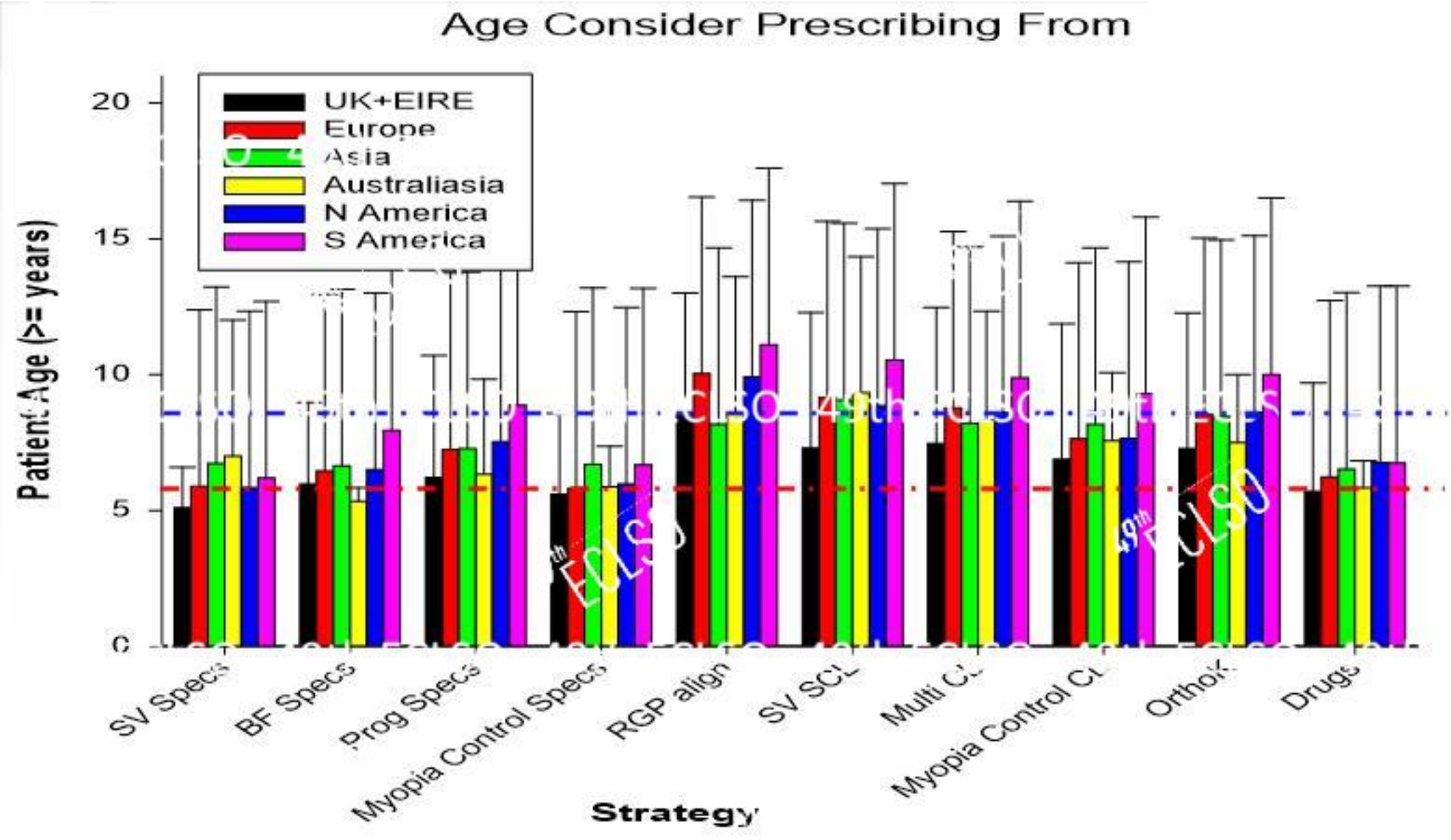
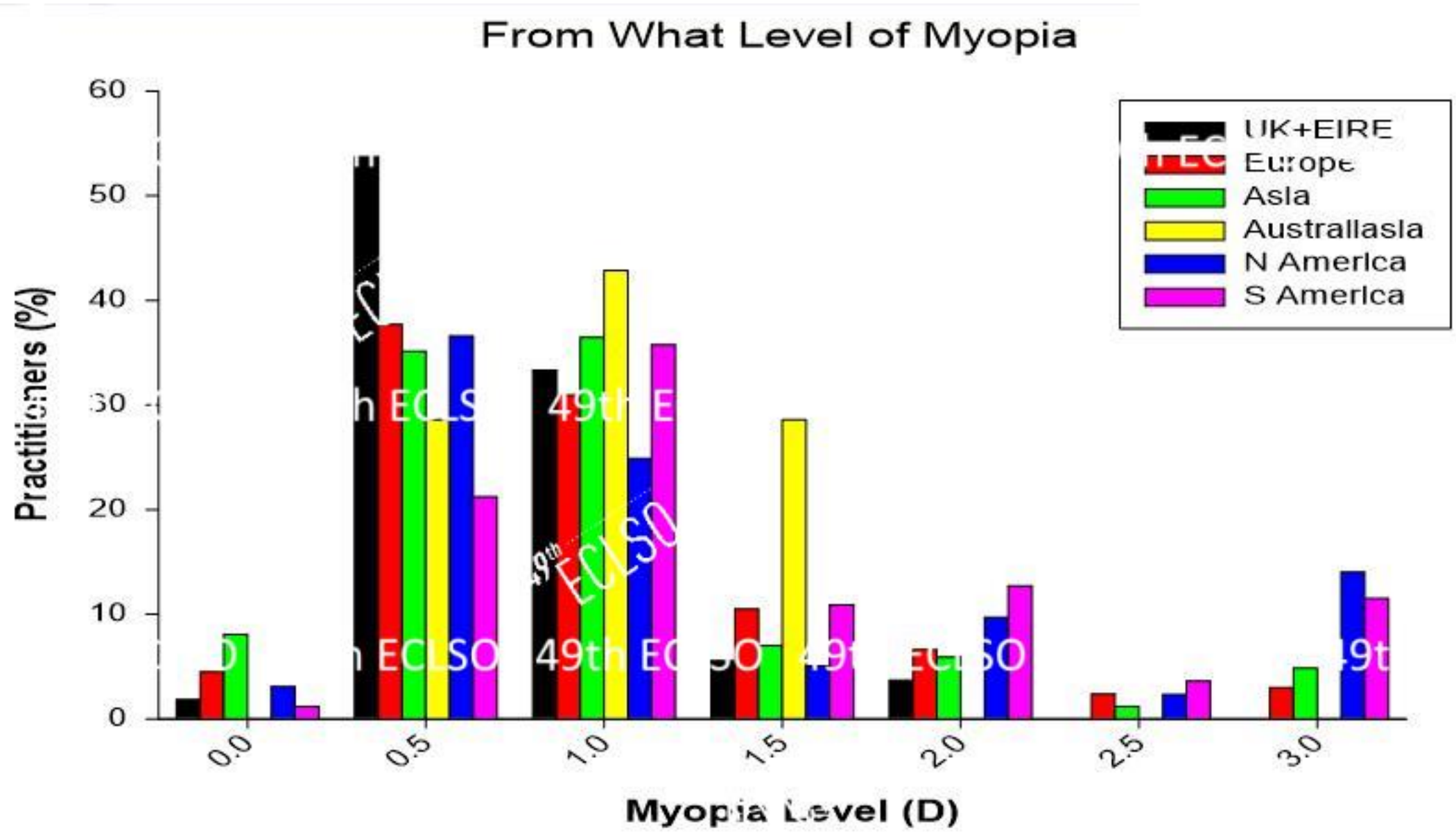
Ongoing

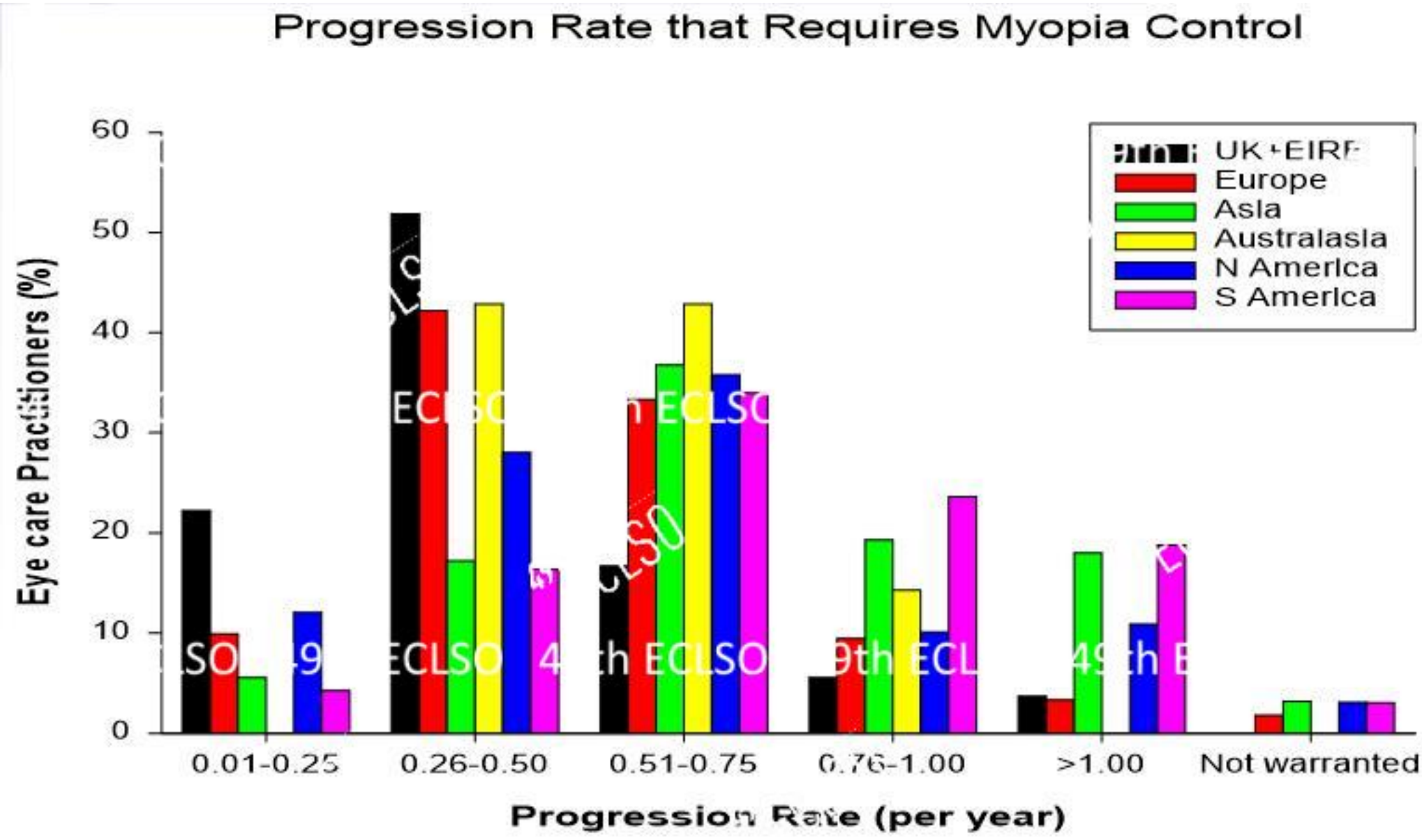

Concern Increasing Myopia in My Practice
Level of Concern
10
8
6
4
2
0
UK+EIRE
Europe
Asia
Australasia
N America
S America
Geographical Location


How Active in Myopia Control?
Activity
10
8
6
4
2
0
UK+EIRE
Europe
Asia
Australasia
N America
S America
Geographical Location

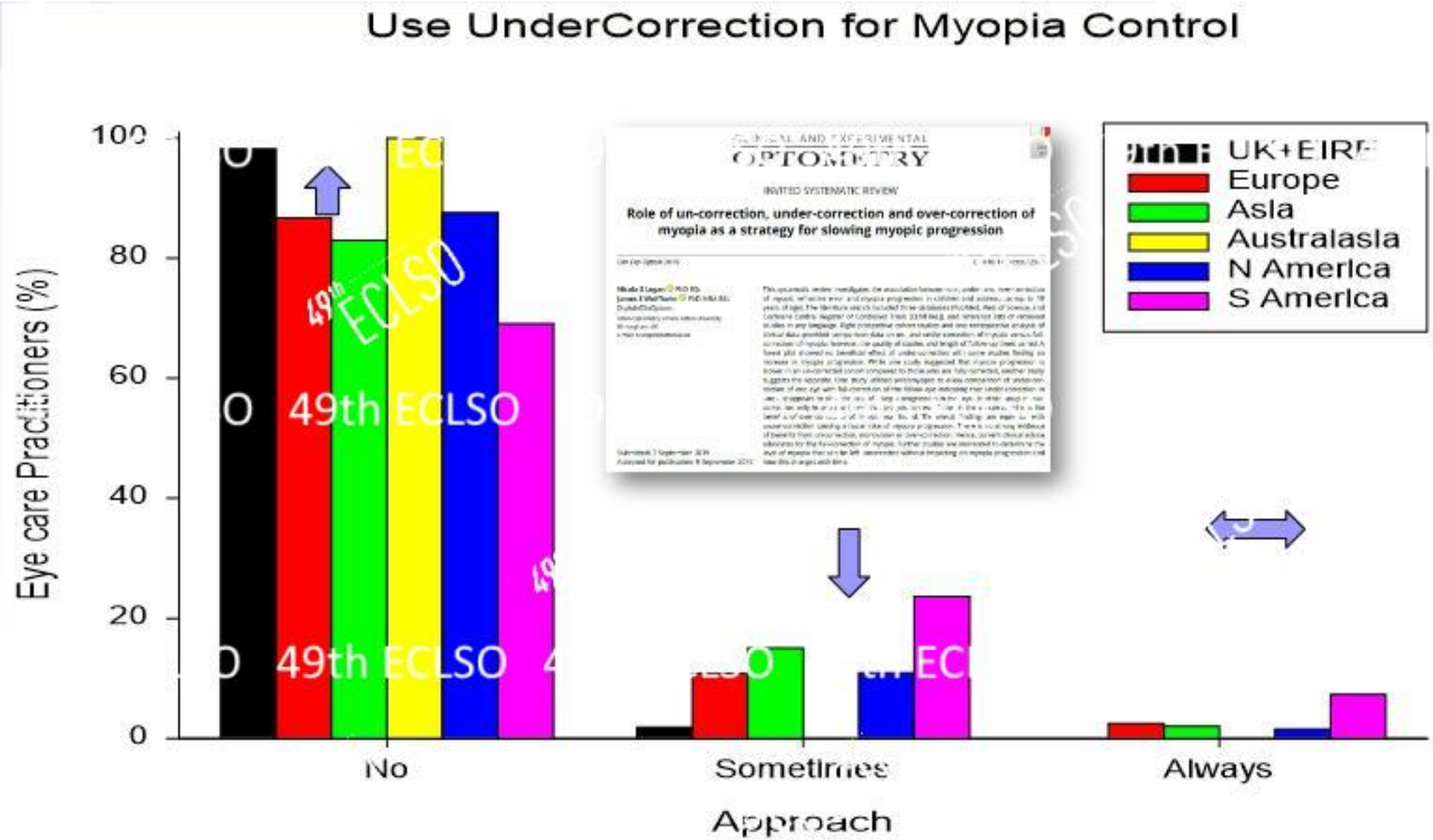

Myopia Control Approaches
Progressing Myopes (%)
100
80
60
20
0
UK+EIRE
Europe
Asia
Australiasia
N America
S America
SV Specs
BF Specs
Prog Specs
Myopia Control Specs
RGP align
SV SCL
Multi CL
Myopia Control CL
Ortho-K
Drugs
Strategy

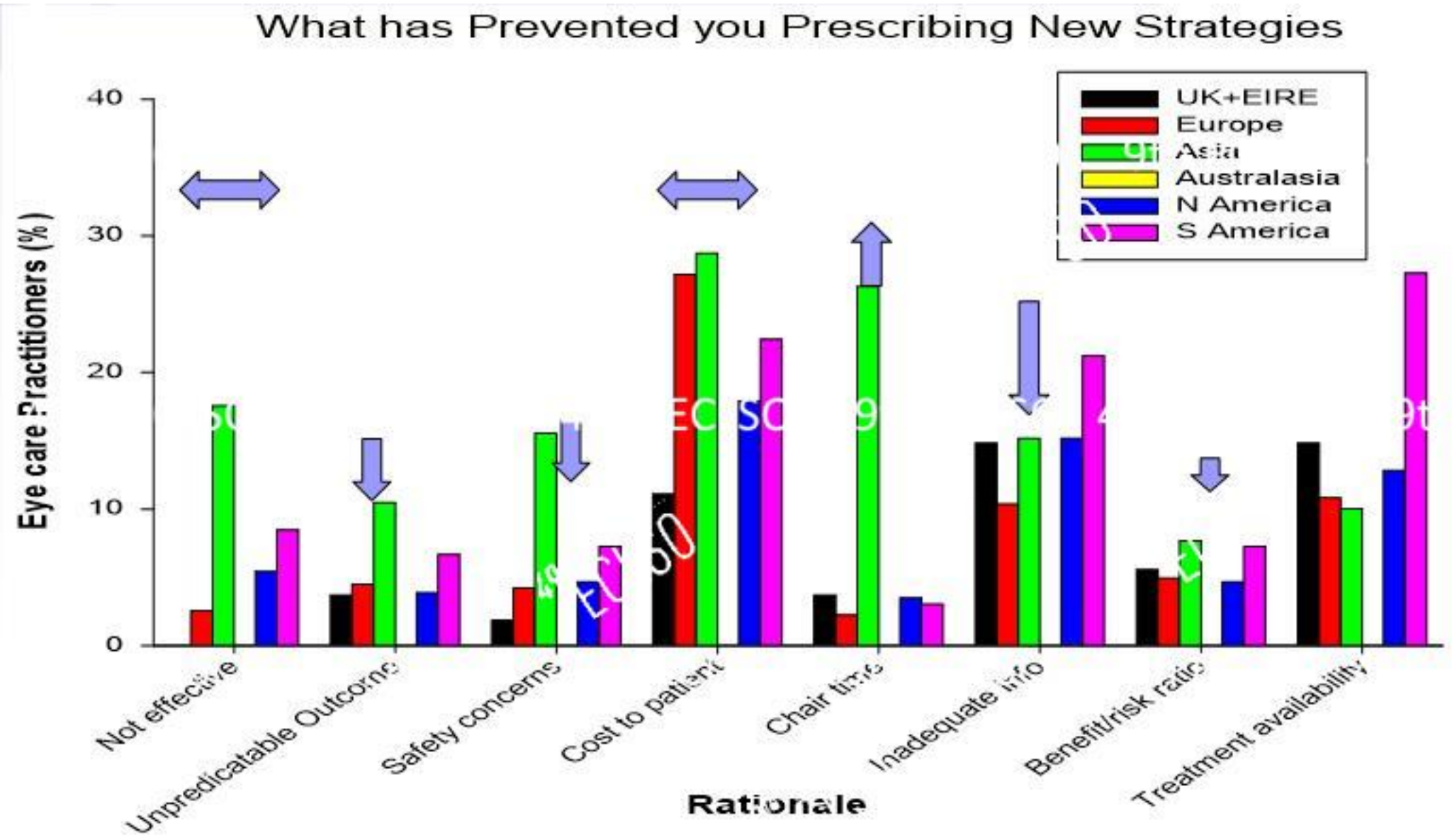

Age Consider Prescribing From
UK+EIRE
Europe
Asia
Australiasia
N America
S America
Patient Age (>= years)
20
15
10
5
0
SV Specs
BF Specs
Prog Specs
Myopia Control Specs
RGP align
SV SCL
Multi CL
Myopia Control CL
Ortho-K
Drugs
Strategy


From What Level of Myopia
Practitioners (%)
60
50
40
30
20
10
0
0.0
0.5
1.0
1.5
2.0
2.5
3.0
Myopia Level (D)
UK+EIRE
Europe
Asia
Australasia
N America
S America


Progression Rate that Requires Myopia Control
Eye care Practitioners (%)
60
50
40
30
20
10
0
UK+EIRE
Europe
Asia
Australasia
N America
S America
0.01-0.25
0.26-0.50
0.51-0.75
0.76-1.00
>1.00
Not warranted
Progression Rate (per year)

Use UnderCorrection for Myopia Control




What has Prevented you Prescribing New Strategies
UK+EIRE
Europe
Asia
Australasia
N America
S America
Eye care Practitioners (%)
40
30
20
10
0
Not effective
Unpredicatable Outcome
Safety concerns
Cost to patient
Chair time
Inadequate info
Benefit/risk ratio
Treatment availability
Rationale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