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studio bärtschi

WHAT'S NEW ON THE SiHy FRONT?

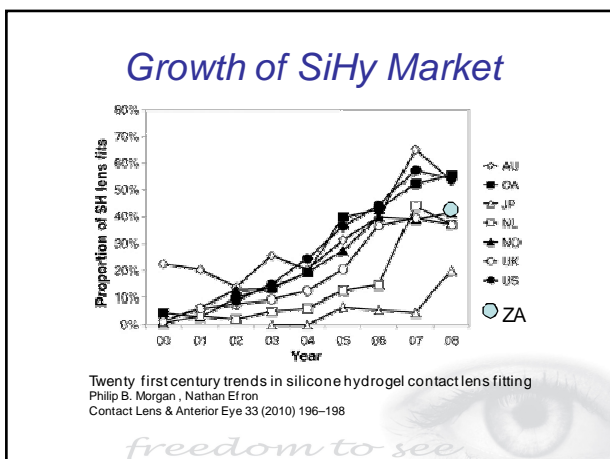
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http://www.kontaktlinsenstudio.ch/medien/medien_Frameset.htm

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What's new on the SiHy front?



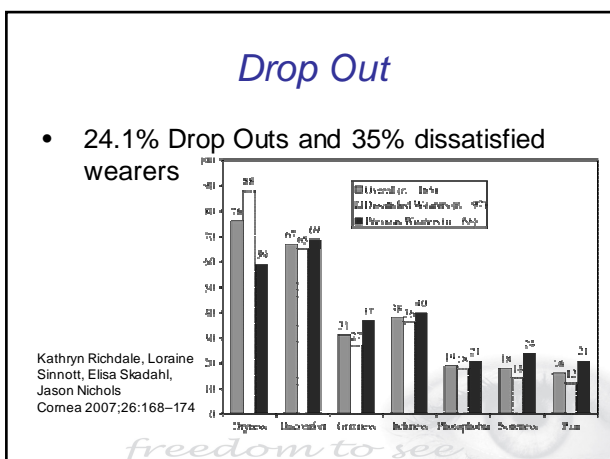
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Marketpenetration of SiHy

2008

	Rigid	OK	Daily disposable	Other soft DW	SiHy DW	Soft EW
United Arab Emirates	2%	0%	26%	18%	19%	34%
Australia (AU)	4%	1%	22%	22%	34%	14%
Bulgaria (BG)	2%	4%	7%	27%	28%	17%
Canada (CA)	5%	1%	9%	34%	45%	7%
China (CN)	0%	0%	2%	90%	9%	0%
Czech Republic (CZ)	0%	0%	19%	14%	54%	3%
Denmark (DK)	2%	0%	60%	16%	9%	0%
Egypt (EG)	2%	0%	4%	79%	7%	0%
Spain (ES)	0%	1%	10%	61%	22%	0%
Hong Kong (HK)	11%	11%	34%	30%	0%	0%
Hungary (HU)	5%	0%	23%	10%	52%	0%
Italy (IT)	11%	2%	22%	34%	23%	0%
Jordan (JO)	3%	0%	20%	40%	31%	0%
Japan (JP)	24%	0%	29%	31%	15%	0%
Russia (RU)	2%	0%	40%	26%	23%	0%
Lithuania (LT)	2%	0%	11%	33%	24%	0%
Netherlands (NL)	25%	5%	7%	27%	23%	0%
Norway (NO)	4%	1%	36%	19%	16%	0%
New Zealand (NZ)	16%	0%	60%	21%	3%	0%
Portugal (PT)	0%	1%	9%	50%	24%	0%
Romania (RO)	7%	0%	10%	58%	22%	0%
Russia (RU)	6%	0%	10%	52%	23%	0%
Slovenia (SI)	10%	0%	10%	16%	63%	0%
Taiwan (TW)	7%	0%	30%	24%	2%	0%
United Kingdom (UK)	10%	0%	34%	24%	22%	0%
United States (US)	19%	0%	13%	29%	44%	0%
South Africa (ZA)	0%	0%	0%	10%	81%	0%
Overall	0%	1%	18%	49%	18%	0%



Opportunities of SiHy

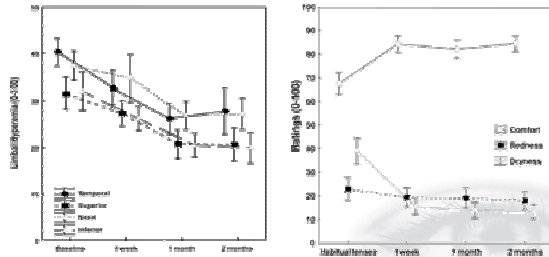


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Daily Wear - Health

- Improvement of corneal signs

Kathryn Dumbleton Optom Vis Sci 2006;83:758-768

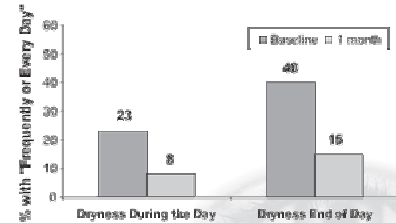


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Daily Wear - Comfort

- More than 50% reduction of symptoms
 - SiHy vs Hydrogel

CHALMERS,
Optom Vis Sci
2008;85:778-784

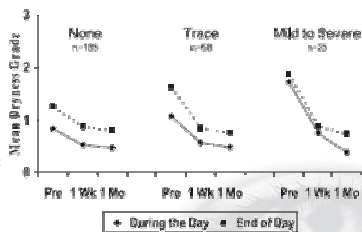


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Daily Wear - Comfort

- Reduced frequency and severity of dryness symptoms by baseline redness

Jeffrey Schafer, Lynn Mitchell, Robin Chalmers,
Eye & Contact Lens 33(5): 247-252, 2007

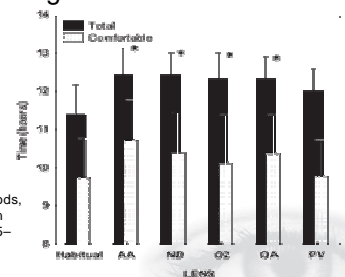


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Daily Wear - Comfort

- Increased wearing time

Kathryn Dumbleton, Craig Woods,
Lyndon Jones, Desmond Fonn
Eye & Contact Lens 34(4): 215-223, 2008



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Continuous Wear - Health

- Pediatric / Geriatric Patients



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Continuous Wear - Health

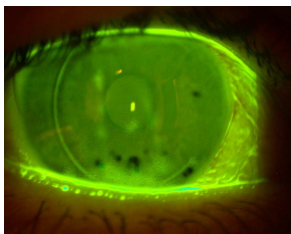
- Bandage contact lens after surgery or injury
- Therapeutic use in cornea disorders
 - EBMD (Map-dot-fingerprint dystrophy) and recurrent Erosio
 - Lagophthalmus
 - Open eyes during sleeping

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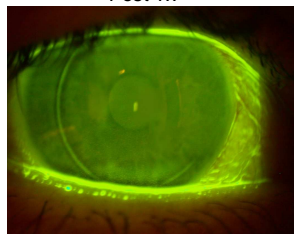
Continuous Wear - Health

- Lagophthalmus during sleeping

Pre Tx



Post Tx



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Continuous Wear - Health

- Non Compliance CW

Contact Lens Replacement Compliance in North America
Dumbleton et al Optom Vis Sci 2010;87:131-139

Reported frequency of wearing lenses during sleep

Lens group	Frequency of sleeping in lenses				
	Never (%)	Only napping (%)	Occasionally (%)	Frequently (%)	Almost every night (%)
Canada					
DD	52	36	7	3	2
Two-week replacement	42	46	8	2	1
One-month replacement	38	35	13	3	11
All lenses	42	39	10	3	6
U.S.					
DD	39	45	14	1	2
Two-week replacement	30	42	14	6	8
One-month replacement	26	29	15	4	24
All lenses	30	38	14	15	13

More patients in the USA reported wearing lenses during sleep "frequently or almost every night" than in Canada ($p < 0.001$).

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CW - Convenience

- Outback and Adventure
- Dating "hoppers"
- Lazy people – like me



Product Overview

	Purevision	Night&Day	AirOptix	PremiO	Biofinity
DK/t	110	175	138	161	160
H ₂ O	36%	24%	33%	40%	48%
Radius	8.30 / 8.60	8.40 / 8.60	8.60	8.30 / 8.60	8.60
Ø	14.00	13.80	14.2	14.00	14.00
Diopter	+6.0 / -12.0	+6.0 / -10.0	+6.0 / -10.0	+6.0 / -13.0	+8.0 / -10.0
Cylinder	0.75 / 1.25 / 1.75 / 2.25	*****	0.75 / 1.25 / 1.75 / 2.25	0.75 / 1.25 / 1.75	0.75 / 1.25 / 1.75 / 2.25
CW	30 days	30 days	7 days	7 days	30 days
Replacement	1 month	1 month	1 month	2 week	1 month
Modulus	1.50	1.52	1.2	???	0.75
Lubricity	17	47	37	???	???
Producer	B&L	Ciba Vision	Ciba Vision	Menicon	Cooper

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Product Overview

	Oasys	Advance	Avaira	TruEye	Clariti
DK/t	154	85.7	125	118	86
H ₂ O	40%	47%	46%	54%	56%
Radius	8.40 / 8.80	8.30 / 8.70	8.40 / 8.50	8.50 / 9.00	8.60
Ø	14.00	14.00	14.20	14.20	14.10
Diopter	+8.0 / -12.0	+8.0 / -12.0	+8.0 / -12.0	+6.0 / -12.0	+8.0 / -10.0
Cylinder	0.75 / 1.25 / 1.75 / 2.25	0.75 / 1.25 / 1.75 / 2.25	*****	*****	*****
CW	7 days	*****	*****	*****	*****
Replacement	2 week	2 week	2 week	1-Day	1-Day
Modulus	0.72	0.43	0.50	0.66	0.50
Lubricity	3	???	???	???	???
Producer	J&J	J&J	Cooper	J&J	Sauflon

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Product Overview

	AirOptix Individual	Definitive (Contamac)	GP
DK/t	117	60	100-163
H ₂ O	32%	74%	<2%
Radius	7.4 – 9.2	Individual	Individual
Ø	13.2 / 14.0 / 14.8	Individual	Individual
Diopter	+20 / -20	Individual	Individual
Cylinder	*****	Individual	Individual
CW	*****	*****	30 Tage
Replacement	3 month	3 – 6 month	1 Jahr
Modulus	*****	*****	*****
Producer	Ciba Vision	Individual	Individual

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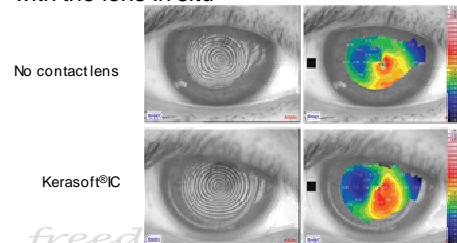
Product Overview

- Kerasoft®IC by Ultravision UK
 - High water content SiHy (DK 60) material (Definitive Contamac)
 - 3 month replacement schedule
 - High levels of comfort
 - Award winning wavefront optics and front surface toric
 - Long wearing times, even in dry environments

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Product Overview

- Kerasoft®IC by Ultravision UK
 - Irregular astigmatism becomes more regular with the lens in situ



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Complications



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Incidence of Complications

Table 3 Annual incidence and relative risk of non-severe and severe keratitis in contact lens wear

Wearing modality	Lens type	Annual incidence*		Relative risk‡	
		Non-severe keratitis	Severe keratitis	Non-severe keratitis	Severe keratitis
Daily wear	Rigid	5.7 (2.2 to 14.7)†	2.9 (0.8 to 10.4)	0.4 (0.2 to 1.1)	0.5 (0.1 to 1.9)
	Hydrogel daily disposable	9.1 (5.5 to 15.1)	4.9 (2.5 to 9.6)	0.7 (0.4 to 1.2)	0.8 (0.3 to 1.8)
	Hydrogel	14.1 (10.4 to 19.0)	6.4 (4.1 to 9.9)	1.0	1.0
	Silicone hydrogel	55.9 (9.9 to 309.7)	0.0 (0.0 to 210.1)	4.0 (0.6 to 28.7)	§
Extended wear	Rigid	0.0 (0.0 to 1758.8)	0.0 (0.0 to 1758.8)	§	§
	Hydrogel	48.2 (13.2 to 174.0)	96.4 (37.5 to 245.2)	3.4 (0.8 to 14.1)	15.2 (5.2 to 44.4)
	Silicone hydrogel	98.8 (60.0 to 162.5)	19.8 (6.7 to 58.0)	7.0 (3.9 to 12.7)	3.1 (0.9 to 10.5)

*Number of cases per 10,000 wearers per year.

†95% confidence limits.

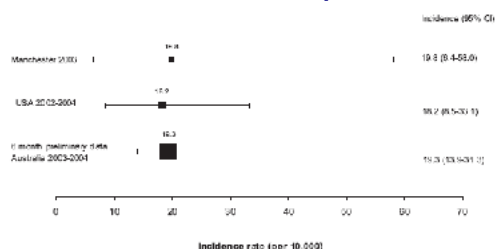
‡Calculated independently for non-severe and severe keratitis, taking "daily wear hydrogel" as the referent in each case.

§Indeterminable because of an annual incidence of zero.

P B Morgan, N Eron et al
Br. J. Ophthalmol. 2005; 89:430-436

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Incidence of Complications

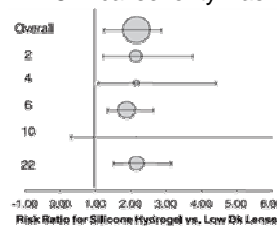


An Early Assessment of Silicone Hydrogel Safety:
Pearls and Pitfalls, and Current Status
Lisa Keay, Ph.D., Katie Edwards, B.App.Sc. (Optom.), and Fiona Stapleton, Ph.D.
Eye & Contact Lens 33(6): 358–361, 2007

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Incidence of Complications

- Risk of developing Corneal Inflammatory Event (CIE) is 2-fold higher with SiHy than low DK
- Clinical severity was lower in SiHy group



LORETTASZCZOTKA,
MIREYA DIAZ
Optom Vis Sci 2007;84:247–256

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Incidence of Complications

- All previous noted studies compared 30 days SiHy vs 7 days CW with low DK lenses
- If SiHy and lowDK was compared on the same time schedule (7 days), SiHy had an insignificant, but slight lower risk than lowDK lens group

U.S. Food and Drug Administration. 7-Day Extended Wear of CIBA Vision Focus Night and Day (lotrafilcon A) soft contact lenses. October 12, 2001. Available at: www.fda.gov/cdrh/pdf/p000030b.pdf. Accessed January 19, 2007

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Risk factors for infiltrative event

- Smoking

John J McNally et al
Eye & Contact Lens 29: 153-156, 2003

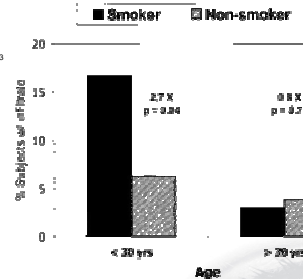


FIG. 2. The impact of smoking across all age groups on risk of infiltrative events with continuous wear.

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Risk factors for infiltrative event

Table 1. Multivariate Analysis of Risk Factors for All Corneal Infiltrates

Factor	Hazard Ratio (95% Confidence Interval)	P Value
Age	0.99 (0.99-1.00)	.97
Sex	1.61 (0.74-3.49)	.23
Smoking	1.73 (0.65-4.88)	.26
Corneal neovascularization	0.54 (0.25-1.4)	.2
Corneal staining	7.23 (2.99-17.87)	<.001
Lidbal reccess	3.13 (1.22-8.28)	.02

Predictive Factors for Corneal Infiltrates with Continuous Wear of Silicone Hydrogel Contact Lenses
Loretta Szczotka-Flynn, OD, MS, et al. Arch Ophthalmol. 2007;125:488-492

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Risk factors for MK

Elieff Morgan et al.

2013, September 2009, Vol. 35, No. 9

Table 1. Some Previously Reported Non-Contact-Related Risk Factors for Microbial Keratitis in Contact Lens Wear

Factor	Relative Risk	Reference	Comment	Reference
Nonprofessional workers	23.3	Professional workers	For extended wear	4
Living in Boston, MA	24.6	Living in New Hampshire	For extended wear	8
Living in southern UK	28.8	Living in northern UK	For MK	14
Older age (>40 years)	22.2	Older age (>40 years)	For extended wear	8
Male gender	22.0	Female gender	For daily wear	8
	22.2	Female gender	For daily wear	4
Hand electronic wrist	23.4	Sub-chronic wrist	For MK	14
Swimming abroad	22.9	Not swimming abroad	For MK	14
Swimming	22.9	Not swimming	For MK	14
	Magistrate test specified			
Lack of disinfection	22.9	Using disinfection	For MK	14
CRB-based disinfectants, used optimally	22.9	Using other chemical system	For MK	14
Chlorine-based disinfectants, used sub-optimally	22.9	Using other chemical system	For MK	14
Smoking	22.7	Not smoking	Population control	7
	23.2	Not smoking	Hospital control	7
	23.5	Not smoking		2
Noncompliance with cleaning procedures	26.8	Compliance with cleaning procedures		2

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Risk for MK vs “real life” risks

A Re-evaluation of the Risk of Microbial Keratitis From Overnight Contact Lens Wear Compared With Other Life Risks; Loretta Szczotka-Flynn, Rouzbeh Ahmadian, Mireya Diaz Eye & Contact Lens 2009;2: 6975

Condition	Population studied	Incidence proportion per 100,000 per year	Comparative ratio
Stroke/MI	U.S. population 2000-2005 (n = 266,410,404)	4.8	264.8
Heart disease	U.S. population 2000-2005 (n = 266,410,404)	2.0	102.8
Ischemic stroke after cataract surgery	A total of 1,117 patients (0.42%) undergoing cataract surgery in the United States	2.0	2.0
Life expectancy	Beaver Dam study subjects (n = 3,650)	206.7	1.0
Microbial keratitis	Extended wear SCL users in United States, Australia, or United Kingdom	211.6	1.0
Radial detachment within 1 yr of cataract surgery	A total of 1,117 patients (0.42%) undergoing cataract surgery in the United States	279.9	~1.3
Loss of >2 lines of BCVA after LASIK	A total of 1,117 patients (0.42%) undergoing cataract surgery in the United States	279.9	~1.3
Eye injury	U.S. population in 2001 (n = 290,796,075)	279.9	~1.3
Early age-related macular degeneration	Beaver Dam study subjects (n = 3,650)	279.9	~1.3
Acute keratitis	Collaborative Longitudinal evaluation of keratitis (CLEK) study subjects (n = 1,265)	279.9	~1.3
Nuclear cataract	Radial detachment within 1 yr of cataract surgery	279.9	~1.3
Corneal infiltrative event with SCL	Extended wear patients studied in international multicenter study	279.9	~1.3

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Risk for MK vs “real life” risks

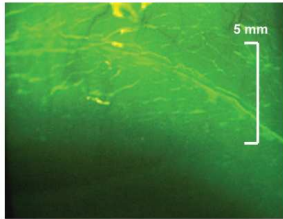
A Re-evaluation of the Risk of Microbial Keratitis From Overnight Contact Lens Wear Compared With Other Life Risks; Loretta Szczotka-Flynn, Rouzbeh Ahmadian, Mireya Diaz Eye & Contact Lens 2009;2: 6975

Condition	Population studied	Incidence proportion per 100,000 per year	Comparative ratio
Stroke/MI	2005 U.S. population (n = 266,410,404)	5.6	37.4
Heart disease	2005 U.S. population (n = 266,410,404)	14.9	14.1
Ischemic stroke after cataract surgery	2005 U.S. population (n = 266,410,404)	21.7	6.6
Life expectancy	2005 U.S. population (n = 266,410,404)	140.7	1.5
Microbial keratitis (MK)	Extended wear SCL users in United States, Australia, or United Kingdom	210.6	1.0
Radial detachment within 1 yr of cataract surgery	2005 U.S. population (n = 266,410,404)	291.1	~1.4
Loss of >2 lines of BCVA after LASIK	2005 U.S. population (n = 266,410,404)	416.7	~2.0
Eye injury	2005 U.S. population (n = 266,410,404)	469.2	~2.2
Early age-related macular degeneration	2005 U.S. population (n = 266,410,404)	69.9	~0.3
Acute keratitis	2005 U.S. population (n = 266,410,404)	726.7	~3.5
Nuclear cataract	2005 U.S. population (n = 266,410,404)	2,286.3	~10.9
Corneal infiltrative event with SCL	2005 U.S. population (n = 266,410,404)	3,429.8	~16.3

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New Complication

- CEF (Conjunctival Epithelial Flap)
 - Continuous Wear Complication (CW)
 - Incidence 35% of SiHy in CW modality

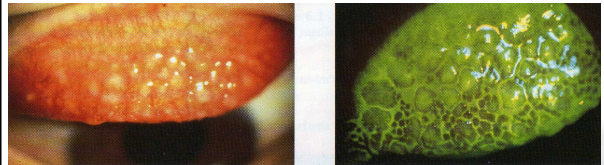


Andrew Graham, Tan Truong,
Meng Lin
Optom Vis Sci 2009;86:E324–E331

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New Complication

- FoCoSi (Follicular-like Conjunctivitis associated with Siliconhydrogels)
 - Presented as Poster at the annual meeting of the AAO 2009 and ARVO 2010



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FoCoSi Introduction

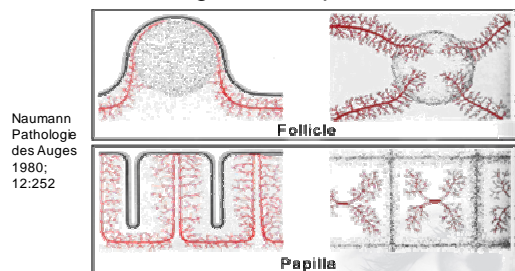
- CLPC (Contact Lens induced Papillary Conjunctivitis) or GPC (Giant Papillary Conjunctivitis) is a relatively common contact lens complication
 - Incidence 1.9% - 45% (especially with conventional Hydrogels and SiHy during CW)

Skotnitsky et al. Clin Exp Optom 2002;85:193–7
Grant et al Invest Ophthalmol Vis Sci 1989; 30:166
Poggio et al Ophthalmol J 1993; 19: 31

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Aetiology of CLPC

- Differential Diagnosis: Papillae vs Follicle



Naumann
Pathologie
des Auges
1980;
12:252

freedom to see

Purpose of FoCoSi Study

- After introduction of SiHy (1999), we (kontaktlinsenstudio baertschi, Switzerland) observed an increased number of follicular-like variation of CLPC in the upper tarsal Conjunctiva
- To prescribe for the first time observation and statistically evaluation of follicular-like conjunctivitis associated with Siliconhydrogels (FoCoSi)

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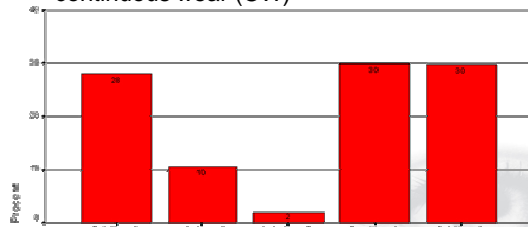
Methode FoCoSi

- Prospective, non randomised Study-Design
 - January 2007 until December 2007
- 1211 participants
 - Neophytes and experienced wearers
 - Age 34.09 (10 until 80)
 - 63% female
- Single Center, kontaktlinsenstudio baertschi, Bern, Switzerland
 - 4 Optometrists

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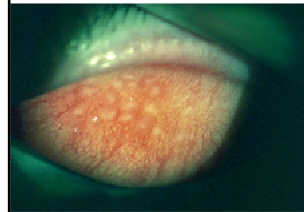
Methode FoCoSi

- Exclusively Siliconhydrogel
 - Daily wear (DW), extended wear (EW) and continuous wear (CW)

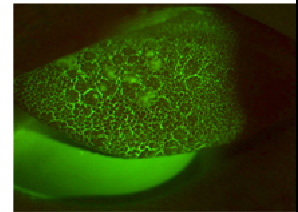


Methode FoCoSi

- Tarsal Conjunctiva with Fluorescein



modified slit lamp picture



fluorescein picture

FoCoSi Results

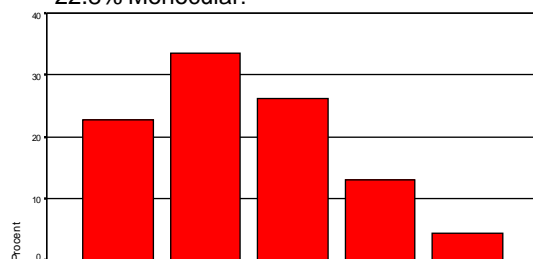
- Gender and age are not significant factors ($p > 0.05$) developing FoCoSi, but males tend to be more prone to that condition
- 3.8% Incidence (n 46)
- Only 50% of FoCoSi cases reported known pollen allergies.

FoCoSi Results

- No viral involvement
 - Cornea showed no infiltration or numulis
 - Pre-auriculäre Lymph nodes was in none FoCoSi case conspicuous
 - FoCoSi was only in the superior tarsal Conjunctiva present

FoCoSi Results

- Amount of FoCoSi Spots per Event
 - 22.8% Monocular!

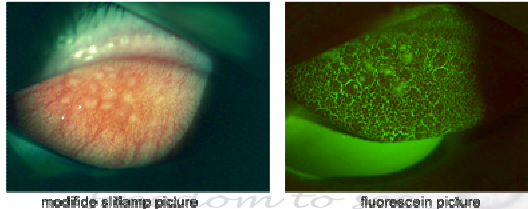


FoCoSi Results

- We divided all FoCoSi in "general" or "local" form
 - Less than 11 FoCoSi Spots were graded as "local"
 - 83.6% appeared as the general form
- The general form created significant more subjective symptoms ($p = 0.003$)

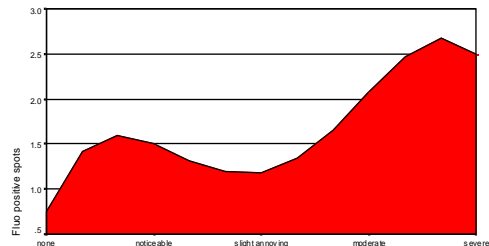
FoCoSi Results

- Fluorescein Positive Spots (FPS)
 - Graded into **activ** and **dormant**
 - 36.6% Fluorescein negativ = **dormant**



FoCoSi Results

- Significant higher rate of symptoms with increasing FPS ($p=0.032$)



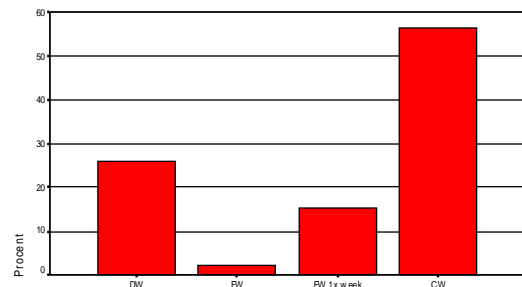
FoCoSi Results

- Risk Ratio for developing FoCoSi depending on used contact lens material

Material	Cohort	Events	Risk-Ratio
Balafilcon A	28.0%	19.6%	0.70
Lotrafilcon A	10.5%	26.1%	2.49
Senofilcon A	29.9%	45.7%	1.53
Galyfilcon A	29.8%	8.7%	0.29

FoCoSi Results

- 56,5% stayed in continuous wear (CW)



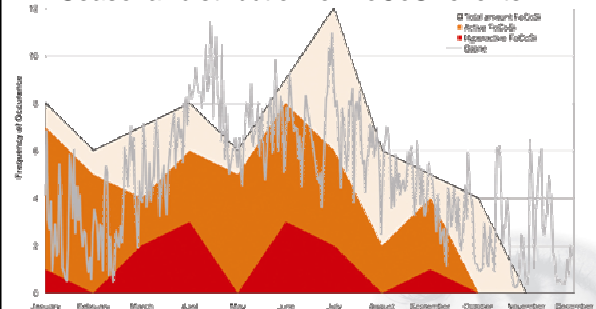
FoCoSi Results

- Lotrafilcon A (2.49) followed by Senofilcon A (1.53) showed the highest risk developing FoCoSi
 - Especially CW
- Short Replacement schedule showed a positive effect in CLPC
 - 1 week replacement didn't lead to CLPC
 - 20.1% FoCoSi had 1 week replacement of their contact lenses (53.9% of the CW Group)

Porazinski et al. CLAO J 1999, 25,3:142-147

FoCoSi Results

- Seasonal distribution of FoCoSi events



FoCoSi Discussion

- FoCoSi Peaks could not be explained by allergic reaction against pollen
 - 50% showed no known allergies
- Environmental influences
 - High Temperature and as a consequence high Ozon pollution between April and August 2007

Swiss federal immission control, Immissionsgrenzwerte der Luftreinhalteverordnung 1985

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FoCoSi Discussion

- Caused by air pollution (Ozon and fine dust), Pollen will be transformed and will increase their allergic potential
 - Washing Pollen will decrease allergic reaction significantly

Behrendt H et al. Int Arch Allergy Immunol 1997;113:69-74

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Care Solution and SiHy



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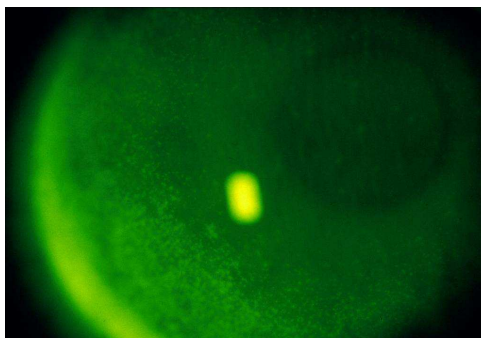
Care Solution and SiHy

- Staining Grid Gary Andrasko, Optometry 2008;79:444-454

		Bausch & Lomb								Private Label Solutions			
		Reveal [®] 1 st Solution	Clear Care [®]	Opti-Free Express [®]	Opti-Free Express [®]	Reveal [®] 1 st Solution	Reveal [®] 1 st Solution	Complete MP [®] Easy Wash [®]	Opti-Free Express [®]	Reveal [®] 1 st Solution	Opti-Free Express [®]	Opti-Free Express [®]	Opti-Free Express [®]
Bausch & Lomb	Reveal [®] 1 st Solution	1%	1%	2%	5%	1%	1%	1%	1%	1%	1%	1%	1%
	Clear Care [®]	1%	1%	1%	2%	12%	25%	8%	12%	81%	64%	62%	42%
	Opti-Free Express [®]	1%	1%	1%	1%	72%	35%	17%	8%	80%	82%	82%	58%
Private Label Solutions	Reveal [®] 1 st Solution	1%	1%	1%	1%	13%	4%	12%	2%	16%	13%	12%	12%
	Clear Care [®]	2%	1%	3%	5%	9%	5%	4%	3%	12%	8%	13%	10%
	Opti-Free Express [®]	2%	2%	3%	2%	4%	2%	2%	2%	4%	3%	3%	2%
Private Label Solutions	Reveal [®] 1 st Solution	2%	1%	4%	7%	12%	63%	16%	21%	71%	76%	74%	51%
	Clear Care [®]	2%	1%	2%	5%	14%	7%	3%	3%	41%	20%	26%	24%
	Opti-Free Express [®]	2%	1%	2%	3%	14%	11%	1%	3%	36%	24%	26%	22%

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Care Solution and SiHy



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Care Solution and SiHy

- Use of generic and private label solution have the highest rate of complication compared with name brand solution
 - 16% of all patients switch non-compliance from the recommended solution

Prevalence of Contact Lens-Related Complications: UCLA Contact Lens Study
Julie Forster et al; Eye & Contact Lens 2009;4: 176180

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Care Solution and SiHy

- Borat buffered packaging solution showed a 20% reduction in epithelial cell viability
 - Phosphat buffered solution showed no reduction

Corneal epithelial cell biocompatibility to silicone hydrogel and conventional hydrogel contact lens packaging solutions; M.B. Gorbet, N.C. Tanti, L. Jones, H. Sheardown; Molecular Vision 2010; 16:272-282

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Antimicrobial contact lens material



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Antimicrobial contact lens material

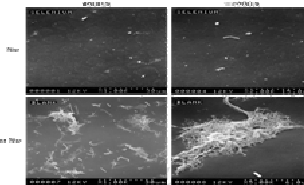
- SiHy showed a higher Bacterial adhesion than conventional hydrogel contact lens material

Henriques M et al. Adhesion of Pseudomonas aeruginosa and Staphylococcus epidermidis to silicone-hydrogel contact lenses. Optom Vis Sci. 2005;82:446–450.
Kodjikian L et al. Bacterial adhesion to conventional hydrogel and new silicone-hydrogel contact lens materials. Graefes Arch Clin Exp Ophthalmol. 2007;246:267–273.
Willcox MD et al. Bacterial interactions with contact lenses: effects of lens material, lens wear and microbial physiology. Biomaterials. 2001;22:3235–3247.

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Antimicrobial contact lens material

- Covalently attached **Selenium** on Balafilcon A contact lenses prevent colonization of Pseudomonas aeruginosa
 - Rabbit eye showed no adverse reaction during a CW wearing time of 2 month



Steven M. Mathew et al
Cornea 2006;25:806–814

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Antimicrobial contact lens material

- Cationic peptide, **melimine**, covalently incorporated into SiHy lenses
 - combination of bee venom and sperm peptide
- In vivo tested on Rabbits and Guinea pigs
 - Significant improvement of purposely induced CLPU and CLARE
 - Significant In vitro reduction of Pseudomonas aeruginosa and Staphylococcus aureus

Neerida Cole, Emma B. H. Hume, Ajay K. Vijay, Padmaja Sankaridurg, Naresh Kumar, Mark D. P. In Vivo Performance of Melimine as an Antimicrobial Coating for Contact Lenses in Models of CLARE and CLPU Invest Ophthalmol Vis Sci. 2010;51:390–395

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Antimicrobial contact lens material

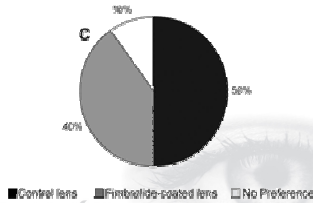
- Covalently attached **fimbrolide** to Lotrafilcon A contact lenses
 - Red Alga metabolite as „interfering transmitter” for microbial communication (quorum sensing)
- Antimicrobial efficiency In vitro
 - 67% reduction of Pseudomonas
 - 87% reduction of Serratia marcescens
 - 92% reduction of Staph. Aureus
 - 70% reduction of Acanthamoeba

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Antimicrobial contact lens material

- First test on human (n=10) for 22h including sleep
 - more back surface debris on awaking
 - slightly more contact lens awareness

Hua Zhu, Mark Willcox,
**Fimbricide-Coated
Antimicrobial Lenses:
Their In Vitro and In Vivo
Effects** Optom Vis Sci
2008;85:292-300



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**KEEP
THE FUTURE IN
SIGHT !**

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http://www.kontaktlinsenstudio.ch/medien/medien_Frameset.htm

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