





Outline

- The Market
- Oxygen transmission
- Physiological Response
- Adverse events
- Compliance















Percentage of Soft Contact Lenses Prescribed*				
	Reusable DW Hydrogel	Reusable DW Silicone Hydrogel	1 Day Hydrogel	1 Day Silicone Hydrogel
Australia	5%	31%	19%	36%
Canada	3%	48%	18%	22%
Japan	15%	24%	33%	13%
United Kingdom	6%	29%	18%	32%
United States	25%	46%	8%	7%

























Outline

- The Market
- Oxygen transmission
- Physiological Response
- Adverse events
- Compliance

Silicone Hydrogel Benefits Hypoxia related complications - problem solved! overnight oedema ~3% ^{1,2} no increase in microcysts ^{2,3} min limbal hyperaemia ^{2,4} min vascularisation ⁵ no myopic creep ⁶ Por D et al.: (DVS 1999; 40:1 2 Poss E dt al.: Conversion: 10:2 Conversion: 10:2

Clinical Consequences of Corneal Hypoxia

- Corneal striae
- Epithelial microcysts
- Epithelial thinning
- Corneal distortion
- Increase in myopia
- Neovascularization
- Endothelial polymegethism
- Limbal hyperemia

Objective and Subjective Responses in Patients Refitted To Daily-Wear Silicone Hydrogel Contact Lenses

Dumbleton K, Keir N, Moezzi A et al

Centre for Contact Lens Research, University of Waterloo, Ontario, Canada Optometry and Vision Science, Vol. 83, No. 10, October 2006









Comparison of Silicone Hydrogel and Hydrogel Daily Disposable Contact Lenses

Jennie Diec, Daniel Tilia, Varghese Thomas.

Brien Holden Vision Institute (J.D., D.T., V.T.), Sydney, Australia; and School of Optometry and Vision Science (D.T.), UNSW, Sydney, Australia.

Methods			
Daily Disposable Soft Contact Lens Types Used in the Trials			
Nelfilcon A	DAILIES AquaComfort Plus, Alcon	Hydrogel	
Omafilcon A	Proclear 1D, CooperVision	Hydrogel	
Delefilcon A	DAILIES Total 1, Alcon	Silicone Hydrogel	
Somofilcon A	Clariti 1D, CooperVision	Silicone Hydrogel	
Narafilcon A	1-DAY Acuvue TruEye, J & J	Silicone Hydrogel	

Difference between baseline and lens wearing visits of physiological variables (0 – 4 grading scale)			
Physiological variable	SiHy DDCL	Hy DDCL	Р
Bulbar redness	0.11 ± 0.46	0.12 ± 0.42	0.08
Limbal redness	0.02 ± 0.47	0.18 ± 0.38	<0.001
Corneal staining	0.14 ± 0.74	0.10 ± 0.76	0.94
Conjunctival staining	0.48 ± 0.92	0.07 ± 0.75	<0.001
Conjunctival indentation	0.62 ± 1.11	-0.02 ± 0.59	<0.001
Upper palpebral redness	0.01 ± 0.45	0.00 ± 0.43	0.63
Upper palpebral roughness	·0.09 ± 0.52	·0.03 ± 0.55	0.042



Contact Lens Wear Time (hrs)			
	SiHy DD lenses	Hyd DD lenses	P value
Average daily wear time	11.3 ± 2.9	11.0 ± 3.2	0.27
Comfortable daily wear time	9.8 ± 3.4	9.1 ± 3.7	0.41
No statis	tically significa	nt differences	

Log MAR Visual Acuity				
	SiHy DD lenses	Hyd DD lenses	P value	
Monocular high - contrast	· 0.057± 0.10	· 0.061 ± 0.10	0.001	
Monocular low · contrast	0.251 ± 0.12	0.233 ± 0.12	<0.001	
Binocular high · contrast	· 0.127 ± 0.07	$\cdot 0.134 \pm 0.07$	<0.001	
None of the differences were clinically significant				





No clinically significant differences between SiHy and Hyd DD lenses for:

- Physiological variables
 Visual Acuity
- Visual AcuityComfort
- Adverse event rates
- Authors suggest that choice of material for DD lenses should be based on

patient and practitioner preference but.....

SiHy material should be considered to prevent hypoxia-related complications with at-risk patients.



Outline	
Outille	
• The Market	
 Oxygen transmission 	

- Physiological Response
- Adverse events
- Compliance

Difficult to accurately report incidence rates results depend on: study design

- criteria used for reporting infiltrates
- Consistently 2X higher rate with reusable SiHy ¹⁻⁵

Szczotka-Flynn & Diaz Optom Vis Sci 2007; 2.Rodford et al Ophthalmology 2009; 3.
 Chalmers et al Optom Vis Sci 2010; 4. Chalmers et al IOVS 2011; 5. Chalmers et al Optom Vis Sci 2012

Annualized Rates of Adverse Events				
Adverse events category	SiHy DD 489.4 years (95% Confidence interval)	Hyd DD 470.9 years (95% Confidence interval)		
Corneal infiltrative events	0.4%, (0.1%–1.5%)	0%, (0.0%–0.6%)		
CL- related adverse event with office visit	1.6%, (0.8%–3.2%)	0.6%, (0.2%–1.9%)		
''Yes'' to red eye question, but no office visit	1.2%, (0.6%–2.7%)	1.1%, (0.5%–2.5%)		
No statistically significant difference				
Chalmers et al Rates of Adverse Events With Hydrogel and Silicone Hydrogel Daily Disposable Lenses in a Large Postmarket Surveillance Registry: The TEMPO Registry IOVS Jan 2015				



Risk factors and causative organisms in microbial keratitis in daily disposable contact lens wear

MK 1±2 per 10,000 wearers per year

Significant Risk Factors:

- wearing CLs every day compared with less frequent use OR $10.4 \ensuremath{x}$
- any overnight wear OR 1.8x
- less frequent hand washing OR 1.8x
- smoking (OR 1.3x
- Certain daily disposable CLs OR 0.2x

Stapleton F, Naduvilath T, Keay L, Radford C, Dart J, Edwards K, et al. PLoS ONE 2017;12(8)1-12.





















