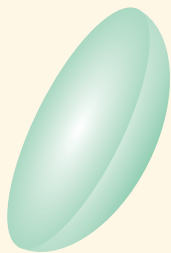



Contact lens

Clinical Pocket Guide

3rd edition



A  CLE



The Association of Optometric Contact Lens Educators (AOCLE) is a non-profit organization committed to fostering the highest levels of education in the areas of cornea and contact lenses and supporting the faculty in these areas at each of the North American schools and colleges of optometry.

For more information and an electronic version of this pocket guide, consult our website at;
www.aocle.org

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Key Questions

- How are you doing with your contact lenses? (Comfort, Vision at distance - near)
- Are your lenses comfortable?
- Do you see well with your lenses?
- How long have you worn your lenses today & on average?
- How old is this pair of lenses?
- What care system do you use and how do you use it? How long have you been on this solution?
- Do you experience any ocular redness, irritation, drying, itching or discomfort?
- If yes, after how many hours of contact lens wear?
- Do you sleep or nap in your lenses? How long? Would you like to?
- Do you have any questions about your contact lenses?

CL related red eye questions

- Chief Complaint:
 - Which eye is affected?
 - How long has the problem existed?
 - Is there discharge? Describe.
 - Is the eye red?
 - Is there pain? Rate pain on a scale from 1 to 10, 10 being the worst.
 - Is the eye sensitive to light?
 - Has there been a change in vision?
 - Have you had (or been around someone with) a cold or flu ?
- Do you wear contacts?
 - What type/brand?
 - What is your wearing time?
 - How often do you sleep in your lenses?
 - How often do you throw out your lenses?
 - What kind of contact lens solution do you use?
 - Have you self treated?
- Other considerations
 - Allergies (medicine/environment)
 - Biomicroscopy
 - Lids and Lashes
 - Conjunctiva
 - Injection (localized, circumlimbal)
 - Cornea
 - Infiltrate (Location, Size)
 - Edema
 - A/C Reaction

Vertex Distance Conversion Table

Spectacle Lens	Plus Lens	Minus Lens	Spectacle Lens	Plus Lens	Minus Lens
4.00	+4.25	-3.87	9.25	+10.37	-8.37
4.25	+4.50	-4.00	9.50	+10.75	-8.50
4.50	+4.75	-4.25	10.00	+11.37	-8.87
4.75	+5.00	-4.50	10.50	+12.00	-9.37
5.00	+5.25	-4.75	11.00	+12.75	-9.75
5.25	+5.62	-5.00	11.50	+13.37	-10.12
5.50	+5.87	-5.12	12.00	+14.00	-10.50
5.75	+6.12	-5.37	12.50	+14.75	-10.87
6.00	+6.50	-5.62	13.00	+15.50	-11.25
6.25	+6.75	-5.75	13.50	+16.12	-11.62
6.50	+7.00	-6.00	14.00	+16.75	-12.00
6.75	+7.37	-6.25	14.50	+17.50	-12.37
7.00	+7.62	-6.50	15.00	+18.25	-12.75
7.25	+8.00	-6.62	15.50	+19.00	-13.00
7.50	+8.25	-6.87	16.00	+19.75	-13.50
7.75	+8.50	-7.12	16.50	+20.50	-13.75
8.00	+8.87	-7.25	17.00	+21.50	-14.12
8.25	+9.12	-7.50	17.50	+22.25	-14.50
8.50	+9.50	-7.75	18.00	+23.00	-14.75
8.75	+9.75	-7.87	18.50	+23.75	-15.12
9.00	+10.12	-8.12	19.00	+24.75	-15.50

For 12mm vertex distance

Fcl = Fspec / 1-D Fspec

Diopter/mm Radius Conversion

Diopters	Radius (mm)	Diopters	Radius (mm)	Diopters	Radius (mm)
37.00	9.121	43.00	7.848	49.00	6.887
37.25	9.060	43.25	7.803	49.25	6.852
37.50	9.000	43.50	7.758	49.50	6.818
37.75	8.940	43.75	7.714	49.75	6.78
38.00	8.881	44.00	7.670	50.00	6.75
38.25	8.823	44.25	7.627	50.25	6.72
38.50	8.766	44.50	7.584	50.50	6.68
38.75	8.708	44.75	7.541	50.75	6.65
39.00	8.653	45.00	7.500	51.00	6.62
39.25	8.598	45.25	7.458	51.25	6.59
39.50	8.544	45.50	7.417	51.50	6.55
39.75	8.490	45.75	7.377	51.75	6.52
40.00	8.437	46.00	7.336	52.00	6.49
40.25	8.385	46.25	7.297	52.25	6.46
40.50	8.333	46.50	7.258	52.50	6.43
40.75	8.282	46.75	7.219	52.75	6.40
41.00	8.231	47.00	7.180	53.00	6.37
41.25	8.181	47.25	7.142	53.25	6.34
41.50	8.132	47.50	7.105	53.50	6.31
41.75	8.083	47.75	7.068	53.75	6.28
42.00	8.035	48.00	7.031	54.00	6.25
42.25	7.988	48.25	6.994	54.25	6.22
42.50	7.941	48.50	6.958	54.50	6.19
42.75	7.894	48.75	6.923	54.75	6.16

$337.5 / \text{radius} = \text{diopters}$

Diopter/mm Radius Conversion

Diopters	Radius (mm)	Diopters	Radius (mm)	Diopters	Radius (mm)
55.00	6.14	61.00	5.53	67.00	5.04
55.25	6.11	61.25	5.51	67.25	5.02
55.50	6.08	61.50	5.49	67.50	5.00
55.75	6.05	61.75	5.47	67.75	4.98
56.00	6.03	62.00	5.44	68.00	4.96
56.25	6.00	62.25	5.42	68.25	4.95
56.50	5.97	62.50	5.40	68.50	4.93
56.75	5.95	62.75	5.38	68.75	4.91
57.00	5.92	63.00	5.36	69.00	4.89
57.25	5.90	63.25	5.34	69.25	4.87
57.50	5.87	63.50	5.31	69.50	4.86
57.75	5.84	63.75	5.29	69.75	4.84
58.00	5.82	64.00	5.27	70.00	4.82
58.25	5.79	64.25	5.25	70.25	4.80
58.50	5.77	64.50	5.23	70.50	4.79
58.75	5.74	64.75	5.21	70.75	4.77
59.00	5.72	65.00	5.19	71.00	4.75
59.25	5.70	65.25	5.17	71.25	4.74
59.50	5.67	65.50	5.15	71.50	4.72
59.75	5.65	65.75	5.13	71.75	4.70
60.00	5.63	66.00	5.11	72.00	4.69
60.25	5.60	66.25	5.09	72.25	4.67
60.50	5.58	66.50	5.08	72.50	4.66
60.75	5.56	66.75	5.06	72.75	4.64

$337.5 / \text{radius} = \text{diopters}$

ICD-9 Codes

Cornea

Corneal ulcer. Unspecified	370.00	Corneal edema due to wearing of contact lenses	371.24
Corneal ulcer. Marginal	370.01	Folds in descemet's membrane	371.32
Ring corneal ulcer	370.02	Rupture in descemet's membrane	371.33
Central corneal ulcer	370.03	Corneal degeneration	371.40
Keratitis. Unspecified	370.90	Corneal degeneration salzmann's nodular	371.46
Superficial keratitis. Unspecified	370.20	Corneal degeneration peripheral (ex. Terrien's)	371.48
Punctate keratitis	370.21	Hereditary corneal dystrophy. Unspecified	371.50
Band-shaped keratopathy	371.43	Other anterior corneal dystrophies	371.52
Vernal keratoconjunctivitis	370.32	Keratoconus. Unspecified	371.60
Limbal and corneal involvement in vernal conjunctivitis	370.32	Keratoconus. Stable	371.61
K sicca - not sjogren's	370.33	Keratoconus - acute hydrops	371.62
Keratoconjunctivitis. Unspecified	370.40	Corneal ectasia	371.71
Corneal neovascularization. Unspecified	370.60	Corneal anesthesia and hypoesthesia	371.81
Localized vascularization of the cornea	370.61	Corneal disorder due to contact lens	371.82
Pannus (corneal)	370.62	Corneal disorder. Unspecified	371.90
Ghost vessels (corneal)	370.64	Corneal abrasion	918.10
Corneal opacity. Unspecified	371.00	Recurrent corneal erosion	371.42
Corneal opacity. Minor	371.01	Corneal foreign body	930.00
Corneal opacity. Peripheral	371.02	Complications of corneal graft	996.51
Corneal opacity. Central	371.03		
Adherent corneal leucoma	371.04		
Phthisical cornea	371.05		
Corneal deposit. Unspecified	371.10	Conjunctiva	
Corneal pigmentations anterior	371.11	Acute conjunctivitis. Unspecified	372.00
Corneal pigmentations stromal	371.12	Acute atopic conjunctivitis	372.05
Corneal pigmentations posterior	371.13	Vernal conjunctivitis	372.13
Corneal edema. Unspecified	371.20	Simple chronic conjunctivitis	372.11
Corneal edema. Secondary	371.22	Other chronic allergic conjunctivitis	372.14
		Chronic follicular conjunctivitis	372.12
		Chronic conjunctivitis. Unspecified	372.10

ICD-9 Codes

Blepharoconjunctivitis, unspecified	372.20	Lagophthalmos, unspecified	374.20
Contact blepharoconjunctivitis	372.22	Ptosis of eyelid, unspecified	374.30
Conjunctivitis, unspecified	372.30	Paralytic ptosis	374.31
Rosacea conjunctivitis	372.31	Blepharochalasis	374.34
Pterygium, unspecified	372.40	Lid retraction or lag	374.41
Pinguecula	372.51	Hemorrhage of eyelid	374.81
Conjunctival concretions	372.54	Edema of the eyelid	374.82
Scarring of conjunctiva	372.64	Dermatochalasis	374.87
Conjunctival hemorrhage	372.72	Retained foreign body of the eyelid	374.86
Conjunctival edema	372.73		
Conjunctival cysts	372.75		

Eyelids and Adnexa

Blepharitis, unspecified	373.00
Hordeolum external	373.11
Hordeolum internal	373.12
Chalazion	373.20
Eczematous dermatitis of eyelid	373.31
Contact and allergic dermatitis of eyelid	373.32
Parasitic infestation of eyelid	373.60
Other inflammation of eyelids	373.80
Inflammation of eyelid, unspecified	373.90
Entropion, unspecified	374.00
Senile entropion	374.01
Mechanical entropion	374.02
Cicatricial entropion	374.04
Trichiasis of eyelid without entropion	374.05
Ectropion, unspecified	374.10
Senile ectropion	374.11
Mechanical ectropion	374.12
Cicatricial ectropion	374.14

Lacrimal System

Dry Eye, unspecified (tear film insufficiency unspecified)	375.15
Lacrimal system, NOS	375.90
Epiphoria, unspecified	375.20
Epiphoria due to excessive lacrimation	375.21
Epiphoria due to insufficient drainage/	375.22

Other Disorders of the Eye

Redness or discharge of the eye	379.93
Pain in or around eye	379.91

Refraction

Hyperopia	367.00
Myopia	367.10
Astigmatism regular	367.21
Astigmatism irregular	367.22
Anisometropia	367.31
Presbyopia	367.40

Pre-Ocular Tear Film (POTF) evaluation

White light evaluation	Normal observations
Specular reflection of the ocular surface	regular, smooth surface
Blink	complete, 12-15/min (<TBUT)
Lid apposition	good apposition with the globe along the entire lid margin (no entropion/ectropion)
Punctum	open and good apposition
Debris in the POTF	minimal to none
Tear Meniscus	TMH Inf > Sup (0.2-0.4mm) Slight coloration, no frothing or foaming, little to no debris, movement with blink towards the punctum
Viscosity	moderate movement
Lashes	clear, no debris
Meibomian glands	easily expressed with clear liquid secretions
Vital Staining	Normal observations
TBUT	> 10 seconds
Fluorescein staining	< grade 1
Rose bengal/ Lissamine green	< grade 1
Jones Test	patent nasolacrimal system
Tear Tests	Normal observations
Schirmer (w/o anesthesia)	5-10 mm/5 min
PRTT / CTT	>10 mm /15 sec
NIBUT	>Fluorescein TBUT
ULMS/LWE	no staining
LIPCOF	none
Tear ferning	Type I or II (Rolando's criteria)

CL solution sampling guidelines

Contact Lens Solutions

- Sample one (1) starter kit per new contact lens fit/refit/change of solution and consider a written recommendation of the product to promote compliance
- Document the recommended product in the medical record
- Do not offer the patient multiple sample kits
- Do not offer the patient different starter kits, as this will contribute to poor compliance
- Educate the patient on the importance of contact lens case hygiene, which is why a new case is included in each starter kit. Recommend replacing the case every 1-3 months
- Do not break-up starter kits to provide patients with individual components
- Using the latest scientific data, consider any potential CL/Solution incompatibilities to guide your choice of solution
- Explain to the patient how long the sample is likely to last and what to do thereafter (fill an Rx, return for a follow-up visit, etc.)

Rewetting drops

- Sample one (1) bottle of rewetting drop during the eye examination and consider providing a written recommendation to promote compliance
- Document the recommended product in the medical record
- Do not offer the patient multiple sample bottles
- Explain to the patient how long the sample is likely to last and what to do thereafter (fill an Rx, return for a follow-up visit, etc)

General considerations

- Use your discretion in sampling when it may be difficult for a patient to get to a pharmacy (weekends, evenings, holidays)
- To promote compliance, explain to the patient why you have chosen that product, since not all products are the same
- Educate the patient that generic products are usually not the same as the latest brand name products and may change in formulations from year to year
- Instruct the patient to check the expiration dates on all medications, including contact lens solutions
- Promote an annual supply of contact lenses once the fit is complete to promote compliance
- Review manufacturer's recommendations with respect to the given product

Bottle Size: Lubricants/Rewetting drops

Brand Name	Manufacturer	Preservative	Bottle Size
Aquify Comfort drops	CIBA	Phosphoric Acid	10mL
Artelac	B+L	Cetremide/none	10mL/unidose
Bion Tears	Alcon	none	unidose
Blink Contacts Lubricating Eye Drops	AMO	OcuPure	10mL
Blink GelTears Lubricating Eye Drops	AMO	OcuPure	10mL
Blink Tears Lubricating Eye Drops	AMO	OcuPure/none	15mL / 30mL/ unidose
Clorz Plus Lens Drops	Alcon	Polyquad/ED	5mL / 8mL
COMPLETE Blink-N-Clean Eye Drops	AMO	PHMB	20mL
COMPLETE Lubricating and Rewetting Drops	AMO	PHMB	15mL
GenTeal	Novartis	GenAqua	15mL / 25 mL
GenTeal Gel/Gel drops	Novartis	GenAqua	10mL / 15 mL
GenTeal Mild drops/Mild to Moderate (US)	Novartis	GenAqua	15mL / 25mL
I-Drop/I-Drop PM	I-Med	none	unidose
Liposic	B+L	Cetremide	10mL
Moisture eyes	B+L	BAK	15mL
OPTI-FREE Express Rewetting Drops	Alcon	Polyquad/ED	10mL / 20mL
OPTI-FREE RepleniSH Rewetting Drops	Alcon	Polyquad/ED	10mL
Optive (US only)	Allergan	Purite	15mL / 30mL
Optive sensitive (US only)	Allergan	none	unidose
Refresh Celluvisc	Allergan	none	unidose
Refresh Contacts	Allergan	Purite	15mL
Refresh Endura	Allergan	none	unidose
Refresh Liquigel	Allergan	Purite	15mL / 30mL
Refresh Tears	Allergan	Purite	15mL / 30mL
Refresh Ultra	Allergan	Purite	15mL / 30mL
Refresh/Refresh Plus	Allergan	none	unidose

Brand Name	Manufacturer	Preservative	Bottle Size
ReNu Multiplus Lubricating/Rewetting	B+L	Sorbic Acid/ED	8mL
ReNu Rewetting	B+L	Sorbic Acid/ED	15mL
Sensitive Eyes	B+L	Sorbic Acid/ED	15mL
Soothe	B+L	none	unidose
Soothe XP	B+L	PHMB	15mL
Soothe Xtra hydration	B+L	Sodium Borate	15mL
Systane Balance Lubricant Eye Drops	Alcon	Polyquad	10mL
Systane Contacts	Alcon	Polyquad	12mL
Systane Liquid Gel	Alcon	Polyquad	15mL
Systane Lubricant Eye Drops	Alcon	Polyquad/none	15mL / 30mL/ unidose
Systane ULTRA Lubricant Eye Drops	Alcon	Polyquad/none	10mL/unidose
Tears Naturale Forte	Alcon	Polyquad	15mL / 30mL
Tears Naturale Free	Alcon	none	unidose
Tears Naturale II	Alcon	Polyquad	15mL / 30mL
Tears plus (Canada)	Allergan	Chlorobutanol	15mL / 30mL
TheraTears	AVR	Sodium perborate/none	15mL/unidose
TheraTears contact lens comfort drops	AVR	Sodium perborate	10 mL
TheraTears liquid gel	AVR	none	unidose

PHMB = polyhexamethylene biguanide

ED = Edetate Disodium

GenAqua = Sodium Perborate

Bottle size: Gels/ointments/inserts

Brand Name	Manufacturer	Preservative	Bottle Size
Duolube	B+L	none	3.5g tube
Hypo Tears	Novartis	none	3.5g tube
Lacri-lube	Allergan	none	3.5/7g tubes
Lacrisert	Aton Pharma	none	5mg/insert
Liposic	B+L	Cetremide	10g tube
Refresh PM (US only)	Allergan	none	3.5/7g tubes
Systane Lubricant Eye Ointment	Alcon	none	3.5g tube
Tear Gel	Novartis	Cetremide	10g tube
Tears Naturale PM	Alcon	none	3.5g tube

Bottle Size: Lid Hygiene products

Brand Name	Manufacturer	Preservative	Format
Blephagel	I-MED	Methylparabens	40 g tube
CIL-NET	Novartis	EDTA, Bromide Domiphen	100mL
CIL-NET (pads)	Novartis	EDTA, Benzyl alcohol	pads
i.lid'nash	I-MED	Methylparabens	40 g tube
SteriLid/TheraLid	AVR	EDTA, Sodium Hydroxide	48mL foam

Ophthalmic Dye

Dyes	Brand Name	Composition	Format
Fluorescein	Fluorets, Ful Glo, Bio Glo	Fluorescein sodium 1 mg	strip
	Glo Strips	Fluorescein sodium 0.6 mg	strip
Fluorescein (large molecule)	Fluoresoft	Fluorescein sodium 0.35%	solution
	Soft Glo	Flurexon disodium 0.5mg	strip
Fluorescein/anesthetic	Fluress, Fluorox	Fluorescein Sodium 0.25%	solution
		Benoxinate Hydrochloride 0.4%	
	Fluorocaine	Fluorescein Sodium 0.25% Proparacaine HCl 0.5%	solution
	Flura-Safe	Flurexon disodium 0.35% Benoxinate Hydrochloride 0.4%	solution
Lissamine Green	Lissamine green	Lissamine green 1.5 mg	strip
Rose Bengal	Rose Glo	Rose bengal 1.5 mg	strip

Soft Lens Fit Assessment

		good	tight	loose
Centration		full, equal	full, equal	superior, decentered
Lens covers cornea		completely	completely	nasal exposure
Acuity		clear, stable	after blink clear, blur = steep	after blink blur, clear = flat
Movement		perceptible 0.25 (ct = 0.04) 0.25-0.50 (ct = 0.06) 0.50-1.0 (ct = 0.12)	less	more
Other:	Over-K (after blink)	clear, stable	clear, blur = steep	blur, clear = flat
	Push-up test	easy	difficult	easy
	Rapid (forced blink)	smooth movement	slow movement	excessive move- ment

Soft Contact Lens Selection Guideline

Diameter = HVID + 2mm (usually 14.0 - 14.5)

Base Curve: flat K < 42.00 = flatter BC
 42.00 - 45.00 = middle BC
 flat K > 45.00 = steeper BC

Soft Lens Identification Markings

Bausch + Lomb Products

Soflens 38

B + L inversion indicator

Marking on lens Corresponding Base Curve

S BC = 8.4

M BC = 8.7

F BC = 9.0

PureVision

B + L inversion indicator

Ciba Vision Products

Air Optix Aqua

Marking on lens Corresponding Base Curve

CIBA Z4## BC = 8.4

CIBA Z6## BC = 8.6

O₂ Optix

Marking on lens Corresponding Base Curve

CIBA X6## BC = 8.6

Focus Monthly

Marking on lens Corresponding Base Curve

S6 BC = 8.6

S9 BC = 8.9

Focus 2 Week

Marking on lens Corresponding Base Curve

N4 BC = 8.4

N8 BC = 8.8

Focus Toric

Marking on lens Corresponding Base Curve

M2 BC = 9.2

M9 BC = 8.9

Focus Dailies

Sphere, Multifocal, or Toric

No markings

Freshlook

FL inversion indicator

Vistakon Products

1 2 3 Inversion Indicator on the following lenses:

Acuvue Bifocal

1 Day Acuvue Moist

Acuvue 2

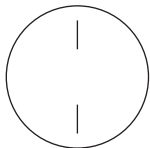
Acuvue Advance

Acuvue Oasys

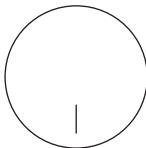
1 Day Acuvue Tru-Eye

Soft Toric Markings

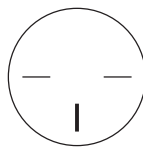
Acuvue Advance/
OASYS for astigmatism



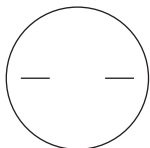
Biomedics Toric
Frequency 55 Toric/XR
Biofinity Toric
Avaira Toric/XR



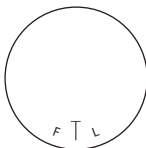
Air Optix for
astigmatism



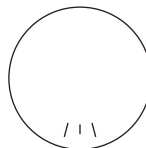
Proclear
Multifocal Toric
Extreme H₂O Toric



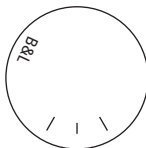
Freshlook Toric
marks represent 20°
between letters



Proclear Toric/XR
marks represent 15° either side



PureVision Toric
marks represent 30° either side



Recommended Soft Contact Lens Replacement Schedules

FDA Group 1 (non-ionic, <50% water)

1 day replacement

J & J	1-Day Acuvue Tru-Eye (Canada/UK)
	1-Day Acuvue Tru-Eye (US)

Two Week Replacement

CooperVision	Avaira (sphere/astig)
J & J	Acuvue Advance (sphere/astig) DW
J & J	Acuvue Oasys (sphere/astig) EW (7 day)
Menicon	Premio

One Month Replacement

Ciba Vision	Air Optix Night&Day Aqua	EW (7 day)
Ciba Vision	Night & Day	CW (30 day)
Ciba Vision	O ₂ Optix	EW (7 day)
CooperVision	Biofinity	DW (US), CW (Canada), (30 day)
CooperVision	Encore 100 (Canada)	

FDA Group 2 (non-ionic, >50% water)

1 Day Replacement

Bausch & Lomb	Softlens Daily disposable
Ciba Vision	DAILIES AquaComfort Plus
Ciba Vision	DAILIES (Sphere, Toric, Progressives)
Ciba Vision	Freshlook One-day
CooperVision	Proclear 1-day

One Month Replacement

CooperVision	Proclear Compatibles	DW
Hydrogel Vision Corp/Centennial	Extreme H ₂ O	DW
Sauflon	Clariti 1 month	

FDA Group 3 (ionic, <50% water)

One Month Replacement

Bausch & Lomb	Purevision (Sphere, Toric, Multifocal)	CW (30 day)
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FDA Group 4 (ionic, >50% water)

1 Day Replacement

Centennial	Definition Everyday (Canada)
Cooper	Clearsight/Biomedic 1-day (sphere/toric)
J & J	1-Day Acuvue
J & J	1 day Acuvue Moist

Two Week Replacement

Giba Vision	Freshlook	FW
CooperVision	Biomedics 55 Premier	DW/EW
J & J	Acuvue 2	DW (2 week) / EW (1 week)

One Month Replacement

Giba Vision	Focus Monthly	DW or EW (7 day)
CooperVision	Frequency 55 (sphere, aspheric, toric)	EW

Silicone Hydrogels (SiHy)

		Company	Lens name	material	FDA
1-Day	Spherical	J&J	1-Day Acuvue Tru-Eye* (US)	narafilcon B	1
		J&J	1-Day Acuvue Tru-Eye* (Canada/UK)	narafilcon A	1
		Sauflon	Clariti 1 Day (Canada)	filcon II	2
2 weeks	Spherical	Cooper	Avaira *	enfilcon A	1
		J&J	Acuvue Advance *	galyfilcon A	1
		J&J	Acuvue OASYS*	senofilcon A	1
		Menicon	Premio (UK)	asmofilcon A	1
	Toric	Cooper	Avaira Toric	enfilcon A	1
		J&J	Acuvue Advance for Astig *	galyfilcon A	1
		J&J	Acuvue OASYS for Astig *	senofilcon A	1
1 month	Spherical	B+L	Purevision	balafilcon A	3
		CIBA	Air Optix Night & Day Aqua	lotrafilcon A	1
		CIBA	O ₂ Optix	lotrafilcon B	1
		CIBA	Air Optix Aqua	lotrafilcon B	1
		Cooper	Biofinity	comfilcon A	1
		Cooper	Encore 100 (Canada)	enfilcon A	1
		Sauflon	Clariti 1 month	filcon II	2
	Toric	B+L	Purevision Toric	balafilcon A	3
		CIBA	Air Optix for Astigmatism	lotrafilcon B	1
	Multifocal	B+L	Purevision multifocal	balafilcon A	3
3 months	Spherical	CIBA	O ₂ Optix Custom	sifilcon A	1
		Blanchard	Exception	SiHy	2
	Toric	Blanchard	Exception Toric	SiHy	2

* UV blocker

data provided by companies

Diam	BC	H2O %	Dk	Dk/t	Modulus	Surface treatment
14.2	8.5	48	55	65	0.71	none**
14.2	8.5/9.0	46	100	118	0.66	none**
14.1	8.6	56	N/A	86	0.50	AquaGen
14.2	8.5	46	100	125	0.50	none**
14.0	8.3/8.7	47	60	86	0.43	none**
14.0	8.4/8.8	38	103	147	0.72	none**
14.0	8.3/8.6	40	129	161	0.90	nanogloss
14.5	8.5	46	100	91	0.5	none**
14.5	8.6	47	60	86	0.43	none**
14.5	8.6	38	103	129	0.72	none**
14.0	8.3/8.6	36	91	101	1.1	plasma oxidation
13.8	8.4/8.6	24	140	175	1.5	
14.2	8.6	33	110	138	1	
14.2	8.6	33	110	138	1	plasma coating
14.0	8.6	48	128	160	0.75	none
14.2	8.5	46	100	125	0.50	none
14.1	8.4/8.8	58	N/A	86	0.50	AquaGen
14.0	8.7	36	91	91	1.1	plasma oxidation
14.5	8.7	33	110	108	1	plasma coating
14.0	8.6	36	91	101	1.1	plasma oxidation
13.2, 14.0 14.8	7.4-9.2	32	82	117	1.1	N/A
14.0, 14.4, 14.8	8.2/8.5/8.8	74	75	75	0.39	N/A
14.0, 14.4, 14.8	8.2/8.5/8.8	74	75	75	0.39	N/A

Dk/t values for -3.00 D

** internal wetting agent (HYDRACLEAR)

Daily disposables

	Company	Lens name	material	FDA
Spherical	B+L	Soflens Daily disposable	hilafilcon B	2
	Centennial	Definition Everyday (Canada)	methafilcon A	4
	CIBA	DAILIES	nelfilcon A	2
	CIBA	DAILIES Aquacomfort plus	nelfilcon A	2
	CIBA	Freshlook One-Day	nelfilcon A	2
	Cooper	Clearsight/Biomedics 1-Day *	ocufilcon A	4
	Cooper	Proclear 1-Day	omafilcon A	2
	J&J	1-Day Acuvue*	etafilcon A	4
	J&J	1-Day Acuvue Moist *	etafilcon A	4
	J&J	1-Day Acuvue Tru-Eye (Canada/UK)	narafilcon A	1
	J&J	1-Day Acuvue Tru-Eye*(US)	narafilcon B	1
	Sauflon	Clariti 1 Day (Canada)	filcon II	2
Toric	B+L	SofLens daily toric	hilafilcon B	2
	CIBA	Focus DAILIES Toric	nelfilcon A	2
	Cooper	Clearsight/Biomedics 1 day Toric*	ocufilcon D	4
	J&J	1-day Acuvue for astigmatism	etafilcon A	4
Multifocals	CIBA	Focus DAILIES Progressives	nelfilcon A	2

* UV blocker

data provided by companies

Diam	BC	H ₂ O %	Dk/t	Specifics
14.2	8.6	59	24	Aspheric
14.2	8.6	55	30	Aspheric
13.8	8.6	69	26	AquaRelease
14.0	8.7	69	26	Triple action moisture
13.8	8.6	69	26	blue/gray/green/hazel
14.2	8.7	52	19	
14.2	8.7	60	28	Aspheric front surface
14.2	8.5/9.0	58	26	Inversion 1-2-3
14.2	8.5/9.0	58	26	Inversion 1-2-3, Lacreon technology
14.2	8.5	46	118	Inversion 1-2-3 SiHy HYDRACLEAR 1 Technology
14.2	8.5	48	65	Inversion 1-2-3 SiHy HYDRACLEAR 1 Technology
14.1	8.6	56	86	SiHy
14.2	8.6	59	18	Cyl 0.75/1.25/1.75, aspheric optics, ComfortMoist™
14.2	8.6	69	26	AquaRelease, double thin zone, cyl 0.75/1.50
14.5	8.7	55	19	Cyl 0.75/1.25
14.5	8.5	58	24	ASD design
13.8	8.6	69	26	AquaRelease, center-near

Dk/t values for -3.00 D

Soft Multifocals

		Company	Lens name	material	Diam
1-Day	Spherical	CIBA	Focus DAILIES Progressives	nelfilcon A	13.8
2 weeks	Spherical	B+L	Soflens multifocal	polymacon	14.5
		CIBA	Focus Progressives	vifilcon A	14.0
		Cooper	Biomedics/Proclear	omafilcon A	14.4
		J&J	Acuvue bifocal *	etafilcon A	14.2
		J&J	Acuvue Oasys for Presbyopia*	senofilcon A	14.3
1 month	Spherical	B+L	Purevision Multifocal	balafilcon A	14.3
		Blanchard	Multi X	hiloxyfilcon B	14.2, 14.5
		CIBA	Air Optix Aqua Multifocal	lotrafilcon B	14.2
		Cooper	Frequency 55 Multifocal	methafilcon A	14.4
		Cooper	Proclear Multifocal	omafilcon A	14.4
		Cooper	Proclear Multifocal XR	omafilcon A	14.4
	Toric	Cooper	Proclear Multifocal Toric	omafilcon A	14.4

* UV blocker

Data provided by companies

BC	Add	Type
8.6	single prog add to +3.00	center-near, AquaRelease
8.5/8.8	low: +1.50 high: +1.75 to +2.50	center-near
8.6/8.9	prog to +3.00	center-near
8.7	add: +1.00	center-distance, aspheric intermediate and near
8.5	add: +1.00 to +2.50	concentric ring design, center-distance with 5 alternating rings
8.4	add: low, mid, high	Aspheric-Zonal Design, Stereo Precision Technology
8.6	low: +1.50 high: +1.75 to +2.50	center-near
8.4, 8.8	add: up to +2.25	
8.6	add: low, mid, high	Aqua moisture system(center, near)
8.7	add: +0.50 to +4.00	center- near, D and N lens
8.7	add: +1.00 to +2.50	D and N lens
8.7	add: +1.00 to +4.00	D and N lens
8.8	add: +1.00 to +4.00	D and N lens

Soft Contact Lens Care

Multi Purpose Solution

Trade Name	Manufacturer	Disinfectant/ Preservative
BioTrue	B+L	PHMB 0.00013%, polyquaternium-1 0.0001%
Complete MPS	AMO	PHMB 0.0001%
OPTI-FREE RepleniSH MPDS	Alcon	Polyquad 0.001%, Aldox 0.0005%
OPTI-FREE Express MPDS	Alcon	Polyquad 0.001%, Aldox 0.0005%
renu fresh	B+L	PHMB 0.0001%
renu sensitive	B+L	PHMB 0.00005%
Solocare Aqua	CIBA	Polyhexanide 0.0001%

PHMB: polyhexamethylene biguanide

Peroxide

Trade Name	Manufacturer	Disinfectant/ Preservative
AOsept	CIBA	3% H ₂ O ₂
Clear Care	CIBA	3% H ₂ O ₂
Oxysept UltraCare	AMO	3% H ₂ O ₂

Wetting agent	Buffer	Other
Hyaluronan	Sodium Borate/Boric Acid	pH 7.5
	Phosphate	Pluronic F87 (surfactant)
TearGlyde	Sodium Borate	Designed for SiHy lenses
	Sodium Borate	Tetronic 1304 (surfactant)
	Sodium Borate/Boric Acid	Tetronic 1107 (surfactant), Hydranate (chelating agent)
	Sodium Borate/Boric Acid	Tetronic 1107 (surfactant)
Dexpanthenol	Tromethamine phosphate	Pluronic F127 (surfactant)

Wetting agent	Buffer	Other
	Phosphate	Platinum disk
	Phosphate	Platinum disk, Pluronic 17R4
	Phosphate	

Gas Permeable Lens Design

Bennett Method

Gas Permeable Base Curve Selection (Minus Lenses)

Corneal Cylinder	Base Curve
plano - 0.50D	0.50-0.75D Flat
0.75 - 1.00D	0.25-0.50D Flat
1.25 - 1.50D	On K -0.25 Flat
1.75 - 2.00D	0.25D Steep
2.25 - 2.50D	0.50D Steep
2.75 - 3.00D	0.50-0.75D Steep

For plus lenses fit 0.25-0.50D steeper than those recommended for minus lenses.

Tetracurve Design

> 8.8mm OAD

SCR = BCR + 0.8mm/0.3mm

ICR = SCR + 1.0mm/0.2mm

PCR = ICR + 1.4mm/0.2mm

Tricurve Design

< 8.8mm OAD

SCR = BCR + 1.0mm/0.3mm

PCR = SCR + 2.0mm/0.3mm

Both should be blended medium ideally

OAD of 8.4-8.8 for >45.50D K reading and decrease OZD

OAD of 9.4-9.6 for <41.50D K reading and increase OZD

Adjustments of Base Curve and Power

0.25 D change in Power for each BC change of 0.05mm

SAM (Steeper Add Minus) or FAP (Flatter Add Plus)

Flatten BC 0.25D (0.05mm) for each increase in OAD & OZ of 0.5mm

Steeper BC 0.25D (0.05mm) for each decrease in OAD & OZ of 0.5mm

Gas Permeable Lens Design

Mid K Method

OAD	8.5mm	9.0mm	9.5mm
BC	avg K	avg K - 0.50D	avg K - 1.00D
OZ	7.3mm	7.8mm	8.3mm
ICR/W	BC + 1.0mm/0.2	BC + 1.0mm/0.2	BC + 1.0mm/0.2
PCR/W	BC + 3.0 to 5.0mm/0.4	BC + 3.0 to 5.0mm/0.4	BC + 3.0 to 5.0mm/0.4
	10.50/0.4	11.25/0.4	12.25/0.4

K > 45.50 use smaller OAD

K < 41.50 use larger OAD

GP Center Thickness Estimation

Power	20 to 49 Dk	50+ Dk
-1.00	0.18	0.19
-2.00	0.16	0.18
-3.00	0.14	0.16
-4.00	0.14	0.15
-5.00	0.13	0.14
>-6.00	0.13	0.14

Rules of Thumb

Increase center thickness 0.02mm for high Dk materials

Increase center thickness 0.02mm for each diopter of corneal astigmatism

Lenticular for >-6.00 and >+3.00, CN bevel for -4.00 to -6.00

GP Material Guide

Name	Type	DK	W.A.	R.I.	S.G.
Accu-con	FSA	25	<25	1.46	1.16
Boston II	SA	12	20	1.47	1.13
Boston IV	SA	19	17	1.47	1.10
Boston EO	FSA	58	49	1.43	1.23
Boston 7	FSA	49	54	1.43	1.22
Boston Equalens	FSA	47	30	1.44	1.19
Boston Equalens II	FSA	85	30	1.42	1.24
Boston ES	FSA	18	52	1.44	1.22
Boston RXD	FSA	24	39	1.44	1.27
Boston XO	FSA	100	49	1.42	1.27
Boston XO2	FSA	141	38	1.42	1.19
FloSi	FSA	26	23.5	1.46	1.12
Fluorex 300	FSA	30	12.6	1.47	1.11
Fluorex 500	FSA	50	13.3	1.46	1.11
Fluorex 700	FSA	70	15.3	1.48	1.10
Fluorocon (60)	FSA	65	14.7	1.47	1.15
Fluoroperm 30	FSA	30	12.8	1.47	1.14
Fluoroperm 60	FSA	60	14.7	1.45	1.15
Fluoroperm 92	FSA	92	16	1.45	1.10
Fluoroperm 151	FSA	151	42	1.42	1.10
Hybrid FS	FSA	31	0	1.48	1.18
Hydro2	FSA	50	<5	1.46	1.15
Menicon Z	FSA	>163	24	1.47	1.20
ONSI-56	FSA	56	7.2	1.45	1.21

S.G. = Specific Gravity

SA = Silicone Acrylate Derivative

NA = Not available

FSA = Fluorosilicone Acrylate Derivative

Name	Type	DK	W.A.	R.I.	S.G.
OP-2	FSA	15	17	1.47	1.12
OP-3	FSA	30	21	1.46	1.12
OP-6	FSA	60	26	1.45	1.11
O-Perm F30	SA	31	<25	1.47	1.09
O-Perm F60	FSA	62	19.2	1.45	1.13
Optacryl 60	SA	18	25	1.47	1.13
Optimum Classic	FSA	26	12	1.45	1.19
Optimum Comfort	FSA	65	6	1.44	1.18
Optimum Extra	FSA	100	3	1.43	1.17
Optimum Extreme	FSA	125	6	1.43	1.16
Paragon HDS	FSA	58	14.7	1.45	1.16
Paragon HDS 100	FSA	100	42	1.44	1.10
Paragon Thin	FSA	29	12.8	1.46	1.14
Paraperm EW	SA	56	26	1.47	1.07
Paraperm O2	SA	16	23	1.47	1.12
Polycon II	SA	12	15	1.48	1.15
SA 18	SA	18	<25	1.47	1.13
SA 32	SA	32	<25	1.47	1.01
SGP	SA	22	<30	1.48	1.13
SGP II	SA	44	<30	1.47	1.13
SGP 3	FSA	44	<20	1.48	1.13
Sport-Sight (30)	FSA	30	12.0	1.47	1.14
Tyro 97	FSA	97	23	1.44	1.187
PMMA	XXX	0	18	1.49	1.20

W.A. = Wetting Angle

SA = Silicone Acrylate

R.I. = Refractive Index

FSA = Fluorosilicone Acrylate

Specialty: Large Diameter

Trade Name	Manufacturers	Diameter (mm)
CCMS	Custom Craft Lens Service of NV	13.0 - 17.0
Scleral lens	Lancaster Contact Lens, Inc.	12.0 - 15.0 or larger
Digiform (L1/RK1/G1/N1)	Tru-Form Optics, Inc.	14.0 - 16.5
Digiform	Quality Contact Lens, Inc.	15.0 (18.0 soon)
Digiform(L1/RK1/G1/N1/K1)	Tru-Form Optics, Inc.	15.0 (Custom avail)
Dyna semi-scleral	Lens Dynamics, Inc.	13.5, 14.0, 14.5, 15.0
EB 15.0	ABBA Optical Inc.	15.0
Jupiter Scleral	Essilor Contact Lenses	15.0 - 20.2
Jupiter Scleral	Medlens Innovations, Inc.	13.5 - 24.0
Maxim	Accu Lens, Inc	Many Different
Mini-Scleral	ABB ConCise Contact Lens	only to 12.5
MSD	Blanchard Contact Lens	15.8 and 18.0
Ocu Flex 55	Ocu-Ease Optical Products, Inc	Any size
Essilor Perimeter	Essilor Contact Lenses	14.0-14.8
Puresite Semi-scleral	Diversified Ophthalmics, Inc.	14.0
Semi-Scleral	ABBA Optical Inc.	13.5
SO ₂ Clear	Art Optical	13.0 - 15.0
Surgical C4	ABBA Optical Inc.	9.0-11.0
TruScleral	Tru-Form Optics, Inc.	18.0
Valley 15 (mini-scleral)	Valley Contax	15.0

Base Curve/SAG	Specifics
Many	Back Toric, Front Toric, Keratoconus, reverse geometry, multifocal
Any BC	Custom made
6.2 to 9.8	Bitoric, bifocal availability
Any BC	Custom made
ANY	Bitoric, bifocal availability, Quadrant Specific Available
5.50 to 9.0 mm	Extra material, increased and decreased edge lifts
With/without reverse geometry	Fit from trial set and customized for each patient
With/without reverse geometry	Fit from trial set and customized for each patient
Any BC	
Many	Custom made
Any BC	
360-580 microns	Midperipheral lymbal zone, decrease, standard, increase, double increase
Any BC	Custom made
7.0-7.8 (OZ)	Boston XO ₂ Risk free lenses fit from trial set and customized for each patient.
5.50-7.90 (.20 steps) Variety -3 to -8	13 lens fitting set
Any BC	Loaner sets available
Any Base Curve 9.50-6.50	Fitting set required- multiple fitting options- presbyopic available
All base curves	Post Surgical, Reverse Geometry Design, Loaner sets available
Any	Radial Venting
Any BC	Made in HDS 100 or Boston

Specialty: Kone

Trade Name	Lens Material	Diameter	Base Curve
ABBA-Kone	Paragon HDS	Made to order	Made to order
AccuCone	Any	8.4 / 9.0 mm	Made to order
AKS	Any	Made to order	Made to order
APK	Any	Made to order	Made to order
Aspheric Cone	Any	Made to order	Made to order
Aspheric K	Any	Made to order	Made to order
AS-15	Boston XO	8.0 - 12.2 mm	Made to order
AS-18	Boston XO	8.0 - 12.2 mm	Made to order
AS-20H	Boston XO	8.0 - 12.2 mm	Made to order
Cak	Any	Made to order	Made to order
CentraCone	Boston ES, EO	9.0 (standard) 8.6 / 8.2 mm	5.3 - 7.6 mm
CentraCone Bi-Symmetry	Boston ES, EO	9.0 (standard) 8.6 / 8.2 mm	5.3 - 7.6 mm
CLCK	Any	Made to order	Made to order
Comfort Cone	Fluoroperm 30	7.8 - 9.5 mm	Made to order
Conforma-K	Boston ES, XO	Made to order	Made to order
CVC	Any	Made to order	Made to order
C5	Any	8.0 - 9.4 mm	5.0 - 7.5 mm
Dist-O-Cone	Fluorex 300 / Paragon HDS	8.0 / 8.5 / 9.0 mm	5.6 - 7.0 mm
Dyna Intra-Limbal	Boston XO	11.2 mm Standard / Custom	Made to order
Formcon	Any	Made to order	Made to order
Globus	Any	7.5 - 9.5 mm	5.0 - 7.0 mm
Horizon Cone	Any	8.0 / 8.5 / 9.0 / 9.5 mm	Made to order

Trade Name	Lens Material	Diameter	Base Curve
Kone	Any	Made to order	Made to order
Ksphere	Any	Made to order	Made to order
K-2 Design	Any	Made to order	Made to order
McGuire Cone	Any	Made to order	Made to order
Ni-cone	Any	Made to order	Made to order
Opal Cone	Any	9.0 - 10.5 mm	5.0 - 11.0 mm
Pellucid Aspheric Back Surface	Boston XO	Made to order	Made to order
ProCone Aspheric	Boston XO	Made to order	Made to order
Pro-ECC	Any	Made to order	Made to order
QuadraKone	Any	Made to order	Made to order
Rose K	Boston Materials	8.7 mm Standard / Custom	Made to order
Rose K2	Boston Materials	Made to order	Made to order
Saper Cone	Any	Made to order	Made to order
Super Cone	Any	Made to order	Made to order
SK 2000	Boston XO	Made to order	Made to order
Tru-Kone	Boston ES, EO, XO	Made to order	Made to order
Ultima-K	Paragon HDS	Made to order	Made to order
VIP Cone	Any	Made to order	Made to order
Valley Kone	Any	Made to order	Made to order
Zenith LD	Boston ES, EO, XO	10.8 - 11.5 mm	Made to order

Specialty: Ortho-K

Trade Name	Lens Material	Diameter	Base curve
BE Retainer	Boston Equalens II	Made to order	Made to order
Dreamlens	Boston Equalens II	Made to order	Made to order
Emerald	Boston XO, Equalens II	9.8 - 10.6 mm	Made to order
Jade	Boston XO, Equalens II	9.8 - 11.4 mm	Made to order
OK Series	Boston XO	8.0 - 12.2 mm	Made to order
Orthofocus	Boston XO, Equalens II	Made to order	Made to order
Ortho Tool	Paragon HDS 100	7.0 - 12.0 (0.5 mm steps)	6.5 - 10.5 mm
Paragon CRT Dual Axis	Paragon HDS , HDS 100	7.0 - 12.0 (0.5 mm steps)	6.5 - 10.5 mm
Paragon CRT RG4	Paragon HDS 100	7.0 - 12.0 (0.5 mm steps)	6.5 - 10.5 mm
Paragon CRT Specialty	Paragon HDS , HDS 100	10.0 - 12.0 (0.5 mm steps)	7.2 - 10.3 mm
Paragon CRT Standard	Paragon HDS , HDS 100	10.5 - 11.5 (0.5 mm steps)	7.2 - 10.3 mm
Vectre 100	Paragon HDS 100	10.8 mm	Made to order

Specialty: Hybrid

Trade Name	Lens Materials	Diameter	Base Curve
Softperm	Synergicon A	14.3 mm	7.1-8.1 mm (6.5/6.7/6.9mm)
SynergEyes A	Paflucofen D (center) / Hemiberfilcon A (skirt)	14.5 mm	7.1-8.0 mm
Synergeyes Duette	RGP center Dk 130 SiHy lens skirt (Dk 84)		
SynergEyes KC	Paflucofen D (center) / Hemiberfilcon A (skirt)	14.5 mm	5.7-7.1 mm (0.2 mm steps)
SynergEyes Multifocal	Paflucofen D (center) / Hemiberfilcon A (skirt)	14.5 mm	7.1 to 8.0
SynergEyes ClearKone	Paflucofen D (center) / Hemiberfilcon A(skirt)	14.5 mm	Vault:100-600 (0.50 micron steps)

Gas Permeable CL care

Trade Name	Manufacturer	Preservative	Other
Boston Advance System	B+L	DYMED, Chlorhexidine gluconate, ED	Cleaner: tri-quaternary cocoa based phospholipid, silica gel, titanium dioxide Conditionner: PVA, PEG
Boston Simplus	B+L	DYMED, Chlorhexidine gluconate	HPMC, poloxamine
Clear Care	CIBA	None	Hydrogen peroxide pluronic 17R4
Menicare GP CDS	Menicon	Benzyl alcohol, ED	Lauryl Suldate Salt of Imidazoline octylphenoxypolyethoxyethanol
Optimum	LOBOB	Benzyl alcohol	Sodium bisulfite
OPTI-FREE GP MPS	Alcon	Polyquad	HP Guar Boric Acid Tetricon 1304

DYMED: Polyaminopropyl Biguanide

ED: Edetate Disodium

PVA: Polyvinyl alcohol

PEG: Polyethylene glycol

HPMC: Hydroxypropylmethyl cellulose

Useful Contact Lens websites

Organizations

- www.aoa.org/x4783.xml (AOA-CL)
- www.aaopt.org (AAO)
- www.aocle.org (AOCLE)
- www.bcla.org.uk (BCLA)
- www.claa.org (CLAA)
- www.clsa.info (CLSA)
- www.gpli.info (GPLI)
- www.iacle.org (IACLE)

Companies

- www.abbconcase.com
- www.acculens.com
- www.amo-inc.com
- www.alcon.com
- www.artoptical.com
- www.bausch.com
- www.blanchardlab.com
- www.cibavision.com
- www.contamac.com
- www.coopervision.com
- www.essilorcontacts.com
- www.injvisioncare.com
- www.lensdynamics.com
- www.menicon.com
- www.paragonvision.com
- www.synergieyes.com
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- www.walman.com

Photos

- www.bausch.com/en_US/ecp/resources/image_library/clinical_photos.aspx

Publications

- www.aoa.org/x7334.xml (Optometry)
- www.claajournal.org (Eye & CL)
- www.clspectrum.com
- www.contactlensjournal.com (CL & Ant Eye)
- www.corneajrnl.com (Cornea)
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- www.opted.org/i4a/pages/index.cfm?pageid=3389 (ASCO residency website)
- www.optometryresident.org (ORMS)
- www.truthaboutstaininggrid.com
- www.staininggrid.com
- www.brienholdenvision.org (IER grading scales)
- www.sclerallens.org

Patient info

- www.aoa.org/contact-lenses.xml (AOA consumer page)
- www.contactlenses.org
- www.mycontactlenses.org
- www.nei.nih.gov/health/dryeye/index.asp (Dry Eye)
- www.mayoclinic.com/health/dry-eyes/ds00463 (Dry Eye)
- www.aoa.org/dry-eye.xml (Dry Eye)
- www.nkcf.org (Keratoconus)
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