Scottish Dry Eye Guidelines

VERSION 1.3

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Introduction

Dry eye is prevalent on a worldwide scale, and is one of the most common reasons for patients to attend eye care practitioners. [1] To the individual, it has a significant impact on quality of life, and at the societal level in economic terms, both with respect to the cost of treatment, and to lost productivity. Dry eye disease (DED) has been defined as follows:

"Dry eye is a multifactorial disease of the ocular surface characterized by a loss of homeostasis of the tear film, and accompanied by ocular symptoms, in which tear film instability and hyperosmolarity, ocular surface inflammation and damage, and neurosensory abnormalities play etiological roles." [2]

An extensive range of treatments are available for dry eye, although there are inherent difficulties in evaluating cost-effectiveness, due to:

- fluctuation of symptoms and signs
- variability in symptom reporting and assessment
- a rapidly-evolving market of available treatments
- a myriad of potential combinations and frequencies of treatment regimes
- lack of clear endpoints to treatment

Dry Eye Working Group

The Scottish Dry Eye working group was established, with the following aims:

- identify current practice for the management of dry eye in community and secondary care
- review existing guidelines and highlight those aspects most applicable to local practices and patients
- determine areas of service provision that need the most improvement
- develop a clear pathway for patient referral to secondary care, and how best to guide treatment upon discharge back to community
- reach a consensus on diagnosis and treatment of DED at a national level
- devise a formulary that balances choice and cost

Invitations to participate in the working group were sent to the following groups:

- community lead optometrists, and those with a special interest in DED
- ophthalmologists specializing in cornea and anterior segment
- hospital pharmacists
- general practitioners and representatives from NHS Education for Scotland
- specialist nurses
- health board leads / managers

Meetings were hosted on 15/11/16 and 20/06/17. Preparatory and summative documentation was sent out to attendees, inviting comments and amendements to ensure that the documents reflected the consensus of the group.

Contributors to Dry Eye Working Group

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Abbreviations

ADDE	Aqueous Deficient Dry Eye
DED	Dry Eye Disease
EDE	Evaporative Dry Eye
HES	Hospital Eye Service
IP	Independent Prescriber
MGD	Meibomian Gland Disease
OSDI	Ocular Surface Disease Index
PVA	Polyvinyl Alcohol
TFBUT	Tear Film Breakup Time

Overview of Guidelines

Dry eye assessment strategy		
Step 1	OSDI[1]	Evaluation at community optometrist – onward referral to IP optom as needed
	Background and risk factors	
	Ocular signs – including Oxford grading system, TFBUT	
	Eyelid disease	
	Documentation of previous treatment strategies	
If symptoms inadequately controlled, consider referral to HES		See referral letter
Step 2	Evaluation as above	Hospital-only
	Consider auto-immune testing	
	Referral to Rheumatology	

Dry eye treatment strategy[2]		
Step 1 *	Education[3]	Initiate in community
	Environmental measures	
	Diet / supplements	
	Systemic & topical medication review	
	Lid hygiene / hot compresses	
	Ocular devices – patient to initiate at their discretion	
	Ocular lubricants – see formulary table below	
Step 2 *	Punctal occlusion (primarily for ADDE)	Specialist dry-eye practitioners
	Topical steroids (aim for minimal duration / dose to achieve effect)	
	Topical antibiotics (Azithromycin)	
	Oral antibiotics (Doxycycline / Azithromycin)	
	Contact lenses	
	Topical ciclosporin (initiate and review in hospital)	
Step 3	Serum tears, surgery, etc.	Hospital-only

*NB No order preference and not mutually exclusive

Proposed combined formulary				
Category	Product	List price*	Preservative-free[4]	List price*
Historic	Hypromellose	£1.21	Hypromellose	£1.98
1st line	Carbomer / PVA	£0.68 / £1.93	Carbomer / PVA	£5.42 (30 vials)
2nd line	-[5]		Carmellose, Hyaluronate	£4.99 / £5.99
Ointments[6]	-		Xailin Night / VitA-Pos / LacriLube	£2.49 / £2.75 / £3.88
MGD	Systane Balance	£7.49	Optive Plus	£7.49
Filamentary	iLube (*PoM*)	£15.68		
Severe DED			Topical ciclosporin (*PoM*)	£72.00

*Indicative list price per item. Subject to variation over time.

[1] Ocular Surface Disease Index, as a minimum baseline dataset

[2] Based on DEWS II and NICE treatment guidelines

[3] See IGA patient info booklet

[4] Consider preservative-free if > 4 drops applied per day, or if allergy to preservatives

[5] 2nd line agents should be preservative-free where possible

[6] Ointments for use at night-time may be added as required; additionally during the day for more severe disease

Decision to move from 1st to 2nd line and on is driven by no improvement in symptoms and / or signs after 6 – 8 weeks.

Dry Eye Assessment Strategy

Tools for evaluating dry eye

A range of tools were for evaluating the symptomatology of DED. These included:

- Undirected history & examination
- Ocular Surface Disease Index (OSDI) [3]
- Speed questionnaire [4]
- Symptom Assessment iN Dry Eye (SANDE) [5]
- McMonnies [6]

All of the above tests have been validated in comparative studies, and may be used for both clinical and research purposes. Of these tests, the group decided in favour of OSDI, as it is relatively simple to follow and score, and is already familiar to many practitioners working with DED patients.

Relevant medical history

In addition to the symptoms reported by the patient, it is important to record any relevant risk factors or precipitating factors. As a minimum dataset, this would include:

- Contact lenses
- Medications
- Arthritis / Sjögren's syndrome
- Thyroid disease
- Smoking
- Laser refractive surgery

A note should also be taken of any eye drops or other treatments for DED currently / previously used, and negative findings, both in history and examination.

Eye examination

An examination should be performed at every visit, with specific attention paid to any changes associated with DED. These include:

- Redness
- Blepharitis / eyelid disease
- Fluorescein staining & mucus filaments
- Tear film height & break-up time

A tool such as the Oxford grading scheme [7] may assist in more accurately recording objective signs at each visit. However, it is important to note that there is often discordance between the symptoms of dry eye and the observable signs.

Dry Eye Treatment Strategy

Patient-centred care [1, 8]

Patients must be empowered to trial a range of treatment options, and to settle on a combination that suits them as an individual. With clear explanations of the treatments available, the nature and purpose of treatment, and encouragement to adjust regimes pre-emptively, it is anticipated that most patients may be managed in community. It is often helpful to invest time with patients in these explanations, to help them manage dry eye disease more independently and to come to terms with it as a chronic condition.

A holistic approach

Treatment for dry eye entails more than a combination of lubricating eye drops. Beyond the general measures outlined in the above table, and the use of physical devices (Appendix 3), patients may benefit from support groups, online material and other educational resources.

Drop delivery

In addition to the multitude of preparations available for treating dry eye, many of these are supplied in a range of delivery systems, including traditional 5-10ml bottle (often with preservatives), single-use vials, pump-action and valve-based bottles, as well as gels and ointments (See Appendix 3). Patients – particularly those with arthritis – may find some of these quite difficult to use. Selection may ultimately depend upon the bottle type as much as the lubricant it contains.

Bibliography

[1] J. Craig, J. Nelson, D. Azar, C. Belmonte and A. Bron, "TFOS DEWS II Report Executive Summary," *The Ocular Surface,* vol. 15, pp. 802-812, 2017.

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[3] R. Schiffman, M. Christianson, G. Jacobsen, J. Hirsch and B. Reis, "Reliability and validity of the Ocular Surface Disease Index," *Arch Ophthalmol,* vol. 118, p. 615-21, 2000.

[4] W. Ngo, P. Situ, N. Keir and D. Korb, "Psychometric Properties and Validation of the Standard Patient Evaluation of Eye Dryness Questionnaire," *Cornea,* vol. 32, pp. 1204-1210, 2013.

[5] F. Amparo, D. Schaumberg and R. Dana, "Comparison of Two Questionnaires for Dry Eye Symptom Assessment: The Ocular Surface Disease Index and the Symptom Assessment iN Dry Eye," *Ophthalmology,* vol. 122, pp. 1498-1503, 2015.

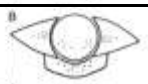
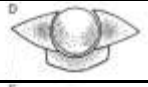
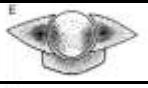
[6] C. McMonnies and A. Ho, "Responses to a dry eye questionnaire from a normal population.," *J Am Optom Assoc,* vol. 58, p. 588-91, 1987.

[7] A. Bron, V. Evans and J. Smith, "Grading of corneal and conjunctival staining in the context of other dry eye tests," *Cornea,* vol. 22, pp. 640-50, 2003.

[8] National Institue of Clinical Excellence, "Dry eye syndrome.," Aug 2017. [Online]. Available: https://cks.nice.org.uk/dry-eye-syndrome. [Accessed Sep 2018].

Appendix 1

Oxford Grading Scheme

Panel	Grade	Dot count per sector
	0	1
	I	10
	II	32
	III	100
	IV	316
	V	>316

Appendix 2

Ocular Surface Disease Index (OSDI)

	All the time (4)	Most of the time (3)	Half of the time (2)	Some of the time (1)	None of the time (0)	N/A
Have you experienced any of the of the following during the last week?						
1. Eyes that are sensitive to light?						
2. Eyes that feel gritty?						
3. Painful or sore eyes?						
4. Blurred vision?						
5. Poor vision?						
Subtotal for section 1	(max 20)					
Have problems with your eyes limited you in performing any of the following during the last week?						
6. Reading?						
7. Driving at night?						
8. Working with a computer?						
9. Watching TV?						
Subtotal for section 2	(max 16)					
Have your eyes felt uncomfortable in any of the following situations during the last week?						
10. Windy conditions?						
11. Places with very low humidity?						
12. Areas that are air conditioned?						
Subtotal for section 3	(max 12)					
Add subtotals (= “D”)	(max 48)					
No. questions answered (= “E”)	(max 12)					
OSDI score = (D ÷ E) x 25	(max 100)					

Appendix 3

Devices for treating dry eye

Treatment	Details	Examples	Guide price approx
Tear retention			
Punctal plugs	Absorbable plugs		£6.20 / pair
	Permanent plugs		£25.67 / pair
Moisture chamber spectacles			£45 - £115
Contact lenses	Silicone hydrogel lenses		£4.05 / pair
	Scleral lenses		£120/ pair
Meibomian gland dysfunction			
Nutritional supplements	Essential fatty acids	Omega 3	£18.93 / mth
"At home" heat treatments	Warm compresses / eye masks		£3.33 - £30 / mth
	Goggles	Blephasteam	£175.40
"In office" heat treatments	Thermal pulsation treatment / pulsed light therapy	Lipiflow, E-eye	Cost to pt £700
Blepharitis			
Eye lid hygiene	Lid wipes and cleaning products		£7 - £8 / mth
"In office" eyelid cleaning		Bleph-ex	Machine £835 Disposable tips £12 / use
Demodex blepharitis	Lid wipes with tea tree oil	Cliradex	£30 / mth

Bottle / Device types for artificial tears

	Artificial Tear Product Examples			
Product	Standard bottle	Pump-action / valve	Single-use vial	Gel tube
Bottle / Device				
Carbomer	-	Evolve Carbomer	Carbomer 980 SDU Viscotears SDU	Carbomer 980 Viscotears Xailin Gel
Carmellose	Lumecare Optive Refresh Tears Plus	Evolve Carmellose	Carmize Celluvisc Xailin Fresh	-
Hyaluronate	Blink Intensive Xailin HA	Clinitas Soothe Multi Evolve HA Hylo-Forte Vismed Gel Multi	Vismed Gel SDU	-

Appendix 4

Referral template for dry eye disease

Direct Referral To Hospital Eye Service
Dry Eye

Urgency of referral

HOSPITAL / LOCATION CODE			HOSPITAL		
Patient Surname	Patient Forename			Title	Optometrist Details
DOB		CHI		GENDER	
Address					
Postcode		Tel No			
Ethnicity					
Location Code		HCP Code		Date of Referral	

Patient History & Details	Patient symptomatic	☐
	Previous attendance at HES	☐
	If Yes? Date	
	If Yes? Location	
	Armed Forces Personnel, Immediate families and veterans	
	Translator required?	☐
	If Yes? Language	

Ocular Surface Disease Index (OSDI)	Score each item 0-4				Sum
Light sensitive	Gritty	Pain	Blurred	Poor vision	
Reading	Driving	Computer	TV		
Discomfort when:	Windy	Dry conditions	Air con		
OSDI Score = (D÷E) x 25 = (max 100)			Subtotal (D)		
			Number of questions answered (E)		

Risk factors	Contact lenses	☐	Arthritis	☐	Sjögren's syndrome	☐
	Thyroid disease	☐	Smoking	☐	Laser eye surgery	☐
Medications	Antihistamines	☐	Anti-depressants	☐	Beta-blockers ("-olol")	☐
	Cancer treatment	☐	Diuretics (-"azide")	☐	Anti-psychotics ("-azine")	☐
	Other:					

Eye drops tried, including frequency		Stage 1 Tx exhausted ☐	Compliance confirmed ☐

Right	Ocular Examination	Left
(0-5)	Oxford Grading Scheme	(0-5)
	Eyelid disease	

Vision	Sph	Cyl	Axis	VA	PH VA	Add	NVA
Right							
Left							

GP informed of referral?	☐	GP	
Patient given dry eye leaflet?	☐	GP Practice	

Appendix 5

Request to GP for treatment for dry eye

Date_____

Patient details	Optometrist details [practice stamp)
Surname:	
First name:	
DOB / CHI:	
General Practice:	

Dear Doctor _____ ,

Your patient has been diagnosed with dry eye (READ code F4F14).

I would be grateful if the following could be added to the repeat prescription, to be used as directed to Right / Left / Either* eye:

Substance	P/F?	Cost[1]	Frequency X times per day or "PRN"
Carbomer gel			
E.g. Carbomer, Clinitas, Gel Tears, Viscotears		£0.68	
Poly-Vinyl Alcohol (PVA)			
E.g. Blink revitalizing, Liquifilm, Sno Tears		£1.93	
Carmellose			
E.g. Celluvisc, Evolve Carmellose, Optive, Refresh Plus	✓	£4.80	
Hyaluronate			
E.g. Evolve HA, Hylo-Forte, Vismed, Xailin HA	✓	£5.99	
Combination drops			
E.g. Optive Fusion,[2] Hylo Dual,[3] Thealoz Duo[4]	✓	£9.80	
Paraffin oil[5] (Eye ointments, usually applied nocte)			
E.g. Lacri-lube, Vita-Pos, Xailin Night, Hycosan Night	✓	£2.75	
Other			
Other (specify):			

P/F = Preservative-free

[1] Indicative price within this category
[2] Carmellose and Hyaluronate
[3] Hyaluronate and Ectoin
[4] Trehalose and Hyaluronate
[5] All contain Lanolin

Follow-up for your patient has been arranged as follows:

No follow-up is required	☐
Follow-up with optometrist	☐
Referred to / already in hospital eye service	☐