

DEWS	DRY EYE: DIAGNOSTIC TEST TEMPLATE	
RAPPORTEUR	A.J.Bron	16 th Oct 2004
TEST	Mixed tests	
TO DIAGNOSE	Dry eye	REFERENCES
VERSION of TEST	[V 1]	Nichols et al. 2004
DESCRIPTION	Various tests	
NATURE of STUDY	<p>Nature of study In this study, 75 patients regarded as having mild to moderate dry eye were assessed for symptoms, MG, tear quality, meniscus height, blink quality, TBUT F and BR staining, phenol red test and Schirmer. 70.7% female. 61% using ATS 21.9% met European Criteria for moderate to severe dry eye.</p>	
CONDUCT of TEST	<p>Nature of the Tests: [Summary of all tests in study] The order of tests: History/ Slit-Lamp eg lids, blink, MG/ tear quality and quantity/ F BUT/Fstain cornea-conj/Schirmer I without anaesthetic or phenol red (randomised)/ RB stain of cornea conj.</p> <p>Symptoms: (standardized language)</p> <ul style="list-style-type: none"> • Dryness • Grittiness • Soreness or ache • Tiredness • Discomfort with contact lens (fulltime wearers) <p>Severity: Never Occasionally(2-3 per week) Frequent (almost every day) Constant/Moderate: (Every day to a mild or moderate degree) Constant/Severe: (Every day to a more severe degree)</p> <p>Clinical features: Scale 0-4 Blepharitis/lid irregularity/ tear meniscus debris/ Meniscus height. Millimetres</p> <p>MGD: 0 = Normal. All glands clear of blockade. 1 = 1-2 capped/blocked glands. 2 = 3-4 blocked and secretions thick without expression. 3 = If approximately half the glands blocked/stenosed. 4 = more than half blocked/stenosed, combined with viscous secretions/tears [Note discontinuities in grades; also, is expression used?]</p> <p>Fluorescein instillation: Fluorescein strip wetted with buffered saline [was excess flicked away?]. Drop instilled on inferior palpebral conjunctiva. Blink several times.</p> <p>TBUT: Measured 2 times using 3mm wide beam.</p> <p>Rose Bengal staining: A Rosets™ Rose Bengal Ophthalmic Strip is wetted with sterile buffered saline and instilled on the inferior bulbar conjunctiva. [was excess flicked away?]. [Note: care taken to instill adequate dye.]</p>	Nichols et al. 2004

	<p>STAINING: 5 corneal regions and 4 conjunctival regions as described in the CLEK study.</p> <p>SCHIRMER I Test: Without anaesthetic. Closed eye; placed 2 mm from lateral canthus.</p> <p>PHENOL RED test: Zone –Quick thread is placed ‘in the recommended position over the lateral canthus. Measured at 15 seconds.</p>	Barr et al. 1999 [CLEK study]								
Web Video	NA									
Materials:	<ul style="list-style-type: none"> • Schirmer papers [not defined] • Zone–Quick Phenol red thread test (Showa Yakuin Kako Co , Ltd. And Menicon USA Inc. • Nikon NS-1 Slit Lamp x 16 magnification • Wratten 12 barrier filter to assess fluorescence • Barnes-Hind Ful-Glo® Fluorescein Sodium Ophthalmic strip • Rosets™ Rose Bengal Ophthalmic Strip (Chauvin Pharmaceuticals) • Source of non-preserved buffered saline. 	Nichols et al. 2004								
Standardization	Different requirements for each test.]									
Diagnostic value	<p>Tests Used. Cohen’s k and weighted k</p> <p>0-0.2 = slight agreement</p> <p>0.21-0.4 = fair agreement</p> <p>0.41-0.60 = moderate agreement</p> <p>0.61-0.80 = substantial agreement</p> <p>0.81-1.0 = almost perfect to perfect agreement</p> <p>95% CI for k</p> <p>Fleiss and Cohen weighting</p> <p>percentage agreement</p> <p>intervisit mean difference</p> <p>t test and Wilcoxon sign-rank test</p> <p>intraclass correlation for test –retest reliability</p>									
Repeatability	<p>Schirmer test was repeated at 2 visits, within 2 weeks apart R.E only: One Observer.</p> <p>Only 29 with Schirmer’s ≤ 10 mm: An expected and important observation is that the Schirmer variability increases with increasing value (see also Bjerrum 1996). Scores for this group (not the whole data set) were normally distributed.</p> <p>Intra-observer agreement for the 29 with Sch: ≤ 10 mm.</p> <table border="1"> <thead> <tr> <th>Mean Diff \pm SD</th> <th>P-value Diff to zero</th> <th>95% limits of agreemnt</th> <th>ICC (95%CI)</th> </tr> </thead> <tbody> <tr> <td>-190 \pm3.93</td> <td>0.0148</td> <td>-9.60, 5.80</td> <td>0.438 (0.133, 0.668)</td> </tr> </tbody> </table> <p>The 95% limits of agreement for the phenol red thread test and the Schirmer test were similar but the ICC test for the Phenol red test was much lower and the confidence interval was much larger.</p> <p>Inter-observer agreement. [-] Only one observer</p>	Mean Diff \pm SD	P-value Diff to zero	95% limits of agreemnt	ICC (95%CI)	-190 \pm 3.93	0.0148	-9.60, 5.80	0.438 (0.133, 0.668)	Nichols et al. 2004
Mean Diff \pm SD	P-value Diff to zero	95% limits of agreemnt	ICC (95%CI)							
-190 \pm 3.93	0.0148	-9.60, 5.80	0.438 (0.133, 0.668)							

	<p>Corneal and Conjunctival Staining Sum of all regions: Fluorescein stain: The weighted κ was: 0.69 (95% CI = 0.35, 0.81) and the intraclass correlation coefficient was 0.76 (95% CI = 0.58, 0.87). Rose Bengal stain: The weighted κ was: 0.33 (95% CI = 0.45, 0.93) and the intraclass correlation coefficient was 0.40 (95% CI = 0.09, 0.64).</p> <p>Note that agreement was better for fluorescein than for bengal rose, perhaps because the bengal rose strip gives weaker staining than the fluorescein strip.</p> <p>Note too, that agreement was less good for individual zones assessed independently as follows:</p> <table border="1" data-bbox="443 757 1093 1249"> <thead> <tr> <th colspan="5">Unweighted κ for presence versus absence of F and BR staining. (κ values; (% agreement))</th> </tr> <tr> <th>Zone</th> <th>Cornea Fluor</th> <th>Cornea Bengal R</th> <th>Conj Fluor</th> <th>Conj Bengal R</th> </tr> </thead> <tbody> <tr> <td>Inf</td> <td>0.18(58.7)</td> <td>0.02(81.3)</td> <td>0.25(70.7)</td> <td>0.14(60.0)</td> </tr> <tr> <td>Nas</td> <td>0.23(70.7)</td> <td>- 0.02(94.7)</td> <td>0.14(56.0)</td> <td>0.09(65.3)</td> </tr> <tr> <td>Temp</td> <td>0.47(82.7)</td> <td>0.49(97.3)</td> <td>0.10(54.7)</td> <td>0.46(92.0)</td> </tr> <tr> <td>Sup</td> <td>0.28(82.7)</td> <td>N/A</td> <td>0.31(90.7)</td> <td>N/A</td> </tr> <tr> <td>Centr</td> <td>0.29(81.3)</td> <td>N/A</td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>N/A Not available because no stain K values: 0-0.2 slight agreement; 0.21-0.40 fair agreement; 0.41-0.60 moderate agreement; 0.61-<1.0 excellent; 1.0 =perfect agreement.</p>	Unweighted κ for presence versus absence of F and BR staining. (κ values; (% agreement))					Zone	Cornea Fluor	Cornea Bengal R	Conj Fluor	Conj Bengal R	Inf	0.18(58.7)	0.02(81.3)	0.25(70.7)	0.14(60.0)	Nas	0.23(70.7)	- 0.02(94.7)	0.14(56.0)	0.09(65.3)	Temp	0.47(82.7)	0.49(97.3)	0.10(54.7)	0.46(92.0)	Sup	0.28(82.7)	N/A	0.31(90.7)	N/A	Centr	0.29(81.3)	N/A								
Unweighted κ for presence versus absence of F and BR staining. (κ values; (% agreement))																																										
Zone	Cornea Fluor	Cornea Bengal R	Conj Fluor	Conj Bengal R																																						
Inf	0.18(58.7)	0.02(81.3)	0.25(70.7)	0.14(60.0)																																						
Nas	0.23(70.7)	- 0.02(94.7)	0.14(56.0)	0.09(65.3)																																						
Temp	0.47(82.7)	0.49(97.3)	0.10(54.7)	0.46(92.0)																																						
Sup	0.28(82.7)	N/A	0.31(90.7)	N/A																																						
Centr	0.29(81.3)	N/A																																								
Sensitivity	(true positives) []																																									
Specificity	(100 – false positives) []																																									
Test problems	<p>About 30% were CL wearers. They do not appear to have been analysed separately. Only a single observer was involved in the repeatability measurements. Did patients stop ATS drops before assessment?</p>																																									
Glossary	CLEK = Collaborative Longitudinal Evaluation of Keratoconus																																									

References:

Barr JT, Schechtman KB, et al. (1999). Corneal scarring in the Collaborative Longitudinal Evaluation of Keratoconus (CLEK) Study: baseline prevalence and repeatability of detection. *Cornea* 18(1): 34-46.

Nichols KK, Mitchell GL, et al. (2004). The repeatability of clinical measurements of dry eye. *Cornea* 23(3): 272-85.

