DEW	**DRY EYE: DIAGNOSTIC TEST TEMPLATE**	
RAPPORTEUR	A.J.Bron	18th Oct 2004
TEST	**Schirmer I test without anesthesia.**	
TO DIAGNOSE	A reduction in reflex tear flow. Correlations with symptoms, MGD and tear clearance	REFERENCES
VERSION of TEST	[V 1]	Afonso et al. 1999
DESCRIPTION	An estimation of tear flow stimulated reflexly by insertion of a filter paper into the conjunctival sac.	
NATURE of STUDY	40 patients with irritative symptoms (various exclusions) 40 normal controls of similar age (various exclusions)	
CONDUCT of TESTS	**A number of tests were carried out in this study: ie.** **Questionnaire:** 12 questions, on nature, severity and impact. Minimum severity 0; greatest 56. **MGD** as in Pflugfelder 1998 **Corneal fluorescein stain** (NEI Lemp 1995) scale **Schirmer 1** without anaesthesia: • Eyes open • Short part of paper placed over lower lid margin at junction of middle and lateral third • Read at 5 minutes (See Schirmer Pflugfelder A) **Cochet-Bonnet** aesthesiometry **Tear Clearance**: 5ul of 2% fluorescein. Sample collected at 15 minutes using a polyester, Transorb rod. Also an detailed study of clearance kinetics. See original article: **FCT** = Fluorescein Clearance Test **Fluorometry:**	Pflugfelder, Tseng 1998
Web Video	Not available	
Materials:		
Standardization	Time of day [√] Temperature [√] Humidity [√] Air speed [√] Illumination [√]. Assumed to influence.	
Repeatability	Intra-observer agreement. [-] Inter-observer agreement. [-]	
Sensitivity	**(true positives)** [-]	
Specificity	**(100 – false positives)** [-]	
Other Stats	• Schirmer score correlates inversely with ocular symptom severity (Spearman's rho −0.39, P< 0.001) • Schirmer score correlates inversely with log tear fluorescein concn. At 15 minutes (Fig 5) (r = −0.585, P < 0.001). [note: upper Schirmer values vignetted]. ie low schirmers associated with delayed clearance. • A Receiver Operator plot indicates that the FCT had a higher Sensitivity for identifying cases of ocular	Afonso et al. 1999

- irritation, than the Schirmer 1 test, for Specificities ranging from 40-100% (Fig 3).
- **Corneal Stain Scores:** low Schirmer and delayed clearance correlate with corneal staining: Stain score showed greater correlation with Schirmer test scores (Spearman's rho - -0.39, $P< 0.001$) than with log tear fluorescein clearance (Spearman's rho - -0.263, $P< 0.018$).
- **Corneal sensitivity** correlated with reduced fluorescein clearance (Spearman's rho - -0.38, $P< 0.003$) and reduced Schirmer (Spearman's rho - -0.39, $P< 0.002$).
- **MG Drop out** correlates inversely with Schirmer score ($P < 0.001$ – analysis of variance).
- **MG orifice metaplasia** correlated positively with clearance and negatively with Schirmer scores
- MG Drop out correlates positively with log FC (($P < 0.001$ –analysis of variance).

Normals v Symptomatic subjects Afonso et al. 1997		
% MG acinar loss	Schirmer mm	Log Tear Fluor concn (fl units)
0-33%	23.92 ± 7.58	1.86 ± 0.78
34-66%	15.60 ± 8.52	2.50 ± 0.73
67-100%	$13.04 \pm 10.16*$	$3.07 \pm 0.75*$
MG metaplasia	14.47 ± 8.53	2.81 ± 0.78
No metaplasia	$23.14 \pm 7.67\Psi$	$1.83 \pm 0.71\Psi$
$*$ $P < 0.001$, 0-66% v 67-100% acinar loss. ANOVA Ψ $P < 0.001$, metaplasia v no metaplasia.		

Test problems	Note: Only corneal stain measured in this study – not conjunctival	
Glossary	**FCT** = Fluorescein Clearance Test **FC** = Fluorescein Clearance	

References:

Afonso AA, Monroy D, Stern ME, et al. Correlation of tear fluorescein clearance and Schirmer test scores with ocular irritation symptoms. Ophthalmology 1999;106:803-10

Pflugfelder S C, Tseng SC, Sanabria O, et al. Evaluation of subjective assessments and objective diagnostic tests for diagnosing tear-film disorders known to cause ocular irritation. *Cornea* 1998;17:38-56.