

DEWS	DRY EYE: DIAGNOSTIC TEST TEMPLATE	
RAPPORTEUR	Stephen Kaye	18 th April 2006
TEST	Tear Function Index (<i>Liverpool modification</i>) Email: TFI@clineng-liverpool-nhs.com	
TO DIAGNOSE	<i>To evaluate the tear dynamics of production and drainage and detect subjects suffering from dry eye</i>	Ono et al. 1991 Xu et al. 1995(a) Xu et al. 1995(b) Kaye et al 2001
VERSION of TEST	The test is a modification of that described by Xu et al. (1995) and depends on using prepared filter paper strips containing fluorescein. The test has been designed to allow direct measurement of the TFI using prepared tear strips.	Kaye et al 2001
DESCRIPTION	<i>TFI is the quotient of the Schirmer test value and the Tear clearance rate.(TCR).</i>	
CONDUCT of TEST	A fluorescein-coated tear strip is placed over the lower lid margin at the junction of the middle and lateral third of the lid. 1. The eye is closed and the strip is left in place for 3 minutes 2. On removal, the distance from the strip notch to the wetted dye front is recorded, using the scale provided. 3. The strip is air dried and 4. The intensity of staining is compared with that of the calibrated panel of dilutions, (ranging from 1:1 to 1:128), to determine the TCR. 5. The TFI is defined as the quotient of the Schirmer test and the TCR.	
Web Video	Not available	
Materials:	<ul style="list-style-type: none"> • The standard kit provides a cardboard envelope, containing a docket with 4 see-through pouches. • Each pouch contains 4 sterile, single-use, fluorescein-coated tear-strips together with a calibrated colour scale for reference. • A ruled measurement scale is printed on the envelope, together with • a nomogram and • a set of instructions <p>The kit, containing the prepared strips, together with instructions and calibrated measuring scale and colour scale are provided by the Dept. Clinical Engineering of the Royal Liverpool University Hospital, Prescott Street Liverpool L7 8XP. For further information: Email: TFI@clineng-liverpool-nhs.com</p>	
Variations of technique	TFI as described by Xu et al (1995)	
Standardization	The procedure is standardised. Strips are calibrated for use in each pack.	
Diagnostic value	Identification of subjects suffering from aqueous tear deficiency, for instance in Sjögrens syndrome.	
Repeatability	Intra-observer agreement. [Yes] Inter-observer agreement. [Yes]	Kaye et al 2001
Sensitivity	A TFI of less than 40 is 100% sensitive for patients with SS dry eye	Kaye et al 2001
Specificity	Patients with Sjögren's syndrome have a TFI upper 95% confidence interval of 15 (12 if anaesthetic has been used)	Kaye et al 2001
Other Stats	Less inter-ocular difference and less variability than the original method	Kaye et al 2001
Test problems	As with the Schirmer's test, it is uncomfortable. Also, staining of the ocular surface at the sites of strip contact with the conjunctiva occur after using fluorescein or Rose Bengal.	
FORWARD LOOK	Performing the TFI using prepared filter paper strips with the matched colour dilution is very sensitive for detecting patients with SS dry eye. The test can be used by non-ophthalmically trained personel. Subjects with a TFI of less than 40 can then be referred for an ophthalmic	

References:

Kaye SB, Sims G, Willoughby C, Field EA, Longman L, Brown MC. Modification of the tear function index and its use in the diagnosis of Sjögren's syndrome. *Br J Ophthalmol* 2001;85:193-199

Ono M, Yoshino K, Ogawa Y, et al. Tear clearance rate in normal and dry eye patients. *Invest Ophthalmol Vis Sci (Suppl)* 1991;32:1113

Xu KP, Yagi Y, Toda I, Tsubota K. Tear function index: a new measure of dry eye. *Arch Ophthalmol* 1995a;113:84-88

Xu KP, Tsubota K. Correlation of tear clearance rate and fluorophotometric assessment of tear turnover. *Br J Ophthalmol* 1995b;79:1042-1045.