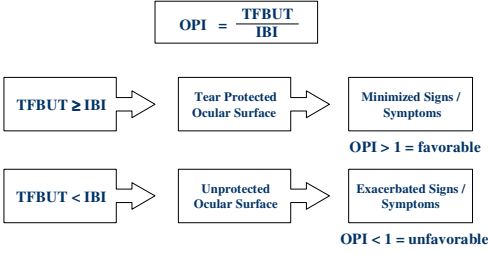


<b>DEWS</b>	<b>DRY EYE: DIAGNOSTIC TEST TEMPLATE</b>	
<b>RAPPORTEUR</b>	Mark B. Abelson and George W. Ousler III	5 <sup>th</sup> Nov 2004
<b>TEST</b>	<b>Ocular Protection Index (OPI)</b>	
<b>TO DIAGNOSE</b>	Ocular Surface Protection Risk of ocular surface damage	Ousler et al. 2002
<b>VERSION</b>	[1]	
<b>DESCRIPTION</b>	The principle of the test is that when the tear film break up time (TFBUT) is shorter than the blink interval (IBI), the eyes are exposed to the risk of focal ocular surface damage. The Ocular Protection Index (OPI) is the ratio of the TFBUT and IBI (TFBUT/IBI), If the OPI score is < 1, then a patient's cornea is at risk of exposure and if the OPI score is ≥ 1, it's not.	Ousler et al. 2002
<b>General note</b>	When studying the relationship between TFBUT and the inter-blink interval (IBI = time between complete blinks), it may be suggested that their interaction assists in regulating the integrity of an ocular surface. For example, the ocular surface is protected when the TFBUT either matches or exceeds than the IBI. In contrast, the surface is unprotected surface when the TFBUT is less than the IBI. This relationship can be clinically relevant since repeated, intermittent exposures of a tear film deficient cornea lead to symptoms and signs such as keratitis and redness.  An index known as the Ocular Protection Index (OPI) can be used to quantify the interaction between the IBI and TFBUT. The OPI is calculated by dividing TFBUT by the IBI. If the OPI score is < 1, a patient's cornea is at risk for exposure, and if the OPI score is ≥ 1, it's not. This approach to measuring alterations in TFBUT has proven to be useful in assessing factors that cause dry eye and evaluating therapies.	
<b>CONDUCT of TEST</b>	<ol style="list-style-type: none"> <li>1. Complete a visual count of the number of blinks per minute while your patient reads the ETDRS chart;</li> <li>2. Calculate IBI = 60 divided by the number of blinks per minute;</li> <li>3. Measure TFBUT;</li> <li>4. Divide TFBUT by the IBI to determine OPI score –</li> </ol> <p style="text-align: center;">Ocular Protection Index (OPI)</p> <div style="text-align: center;"> <math display="block">\text{OPI} = \frac{\text{TFBUT}}{\text{IBI}}</math>  <pre> graph LR     A[TFBUT ≥ IBI] --&gt; B[Tear Protected Ocular Surface]     B --&gt; C[Minimized Signs / Symptoms]     C --- D[OPI &gt; 1 = favorable]     E[TFBUT &lt; IBI] --&gt; F[Unprotected Ocular Surface]     F --&gt; G[Exacerbated Signs / Symptoms]     G --- H[OPI &lt; 1 = unfavorable] </pre> </div>	Ousler et al. 2002
<b>Web Video</b>	Not available	
<b>Materials:</b>	Blink Rate Recorder – <ul style="list-style-type: none"> <li>• ETDRS chart or standard visual task;</li> </ul> TFBUT Measurement –	

	<ul style="list-style-type: none"> <li>• Non-preserved, 2% sodium fluorescein;</li> <li>• Micro-pipette;</li> <li>• <u>Or</u> D.E.T. strip.</li> </ul>	See TFBUT template for details of TFBUT test
<b>Variations</b>		
<b>Standardization</b>	Time of day [X] Temperature [X] Humidity [X] Air speed [X] Illumination [X]	
<b>Diagnostic value</b>	This version : [ X ] OPI Score $\geq 1$ = protected ocular surface OPI Score $< 1$ = unprotected ocular surface	Ousler et al. 2002 Abelson et al. 2002
<b>Repeatability</b>	Intra-observer agreement. [NA] Inter-observer agreement. [NA]	
<b>Sensitivity</b>	[NA]	
<b>Specificity</b>	[NA]	
<b>Glossary</b>	OPI = Ocular Protection Index: TFBUT =Tear film break-up time: IBI = Inter-blink Interval:	

## References

Abelson M, Ousler G, Nally L. Alternate reference values for tear film break-up time in normal and dry eye populations. *Adv Exp Med Biol* 2002;506 (Part B):1121-1125.

Abelson M, Ousler G, Emory T. Dry eye syndrome: diagnosis, clinical trials, and pharmaceutical treatment – ‘improving clinical trials’. *Adv Exp Med Biol* 2002;506 (Part B):506:1079-86.

Nally L, Ousler G, Abelson M. Ocular discomfort and tear film break-up time in dry eye patients: A correlation. *Invest Ophthalmol Vis Sci* 2000;41(4):1436.

Ousler GW, Emory TB, Welch D, Abelson MB. Factors that influence the inter-blink interval (IBI) as measured by the ocular protection index (OPI). (Poster presentation). The Association of Research in Vision and Ophthalmology (ARVO), 2002.