**DEWS**  
**DRY EYE: DIAGNOSTIC TEST TEMPLATE**

<table>
<thead>
<tr>
<th>RAPPORTEUR</th>
<th>Mark B. Abelson and George W. Ousler III</th>
<th>5th Nov 2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEST</td>
<td>Ocular Protection Index (OPI)</td>
<td>Ousler et al. 2002</td>
</tr>
</tbody>
</table>
| TO DIAGNOSE | Ocular Surface Protection  
Risk of ocular surface damage |
| VERSION    | 1                                       | Ousler et al. 2002 |
| DESCRIPTION | 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. |

**General note**  
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.

**CONDUCT of TEST**  
1. Complete a visual count of the number of blinks per  
minute while your patient reads the ETDRS chart;  
2. Calculate IBI = 60 divided by the number of blinks per  
minute;  
3. Measure TFBUT;  
4. Divide TFBUT by the IBI to determine OPI score –  

   \[
   \text{Ocular Protection Index (OPI)} = \frac{\text{TFBUT}}{\text{IBI}}
   \]

   \[
   \text{TFBUT > IBI} \quad \text{Tear Protected Ocular Surface} \quad \text{OPI > 1 = favorable}
   \]

   \[
   \text{TFBUT < IBI} \quad \text{Unprotected Ocular Surface} \quad \text{OPI < 1 = unfavorable}
   \]

**Web Video**  
Not available

**Materials:**  
Blink Rate Recorder –  
- ETDRS chart or standard visual task;  
TFBUT Measurement –
- Non-preserved, 2% sodium fluorescein;
- Micro-pipette;
- Or D.E.T. strip.

**Variations**

**Standardization**
- Time of day [X]
- Temperature [X]
- Humidity [X]
- Air speed [X]
- Illumination [X]

**Diagnostic value**
- This version: [X]
  - OPI Score ≥ 1 = protected ocular surface
  - OPI Score < 1 = unprotected ocular surface

**Repeatability**
- Intra-observer agreement. [NA]
- Inter-observer agreement. [NA]

**Sensitivity**
- [NA]

**Specificity**
- [NA]

**Glossary**
- OPI = Ocular Protection Index
- TFBUT = Tear film break-up time
- IBI = Inter-blink Interval

**References**


