

## Diagnosis of the Dry Eye by Means of the Lid-parallel Conjunctival Folds (LIPCOF)

The incidence of dry eye syndrome is on the increase. Known risk factors, such as computer monitor work, taking of certain pharmaceutical drugs, air-conditioning systems and central heating indicate that it is a typical civilization disease. The prevalence of dry eye also increases with increasing age. It can be assumed that the clinical picture of the dry eye will be diagnosed even more frequently in future. A new method of slit lamp examination saves time and allows easy diagnosis and the classification of the degree of severity of dry eye. Clinical experience gave rise to the assumption that there is a relation between the degree of severity of the dry eye syndrome and the presence or the intensity of the lid-parallel conjunctival folds (LIPCOF). This relation was examined by Höh, Schirra, Kienecker and Ruprecht and classified in the form of a grading scheme.

It turned out that the intensity of LIPCOF and the degree of severity of the Sicca syndrome correlate very well. In fact in the diagnosis of dry eye the assessment of the LIPCOF delivers a negative predictive value of approx. 75% and a positive predictive value of approx. 93%.

### Classification

The classification of LIPCOF is based on the height of the normal tear meniscus and on the number of individual folds contained in the LIPCOF.

Table 1 summarizes the LIPCOF Degrees and their interpretation.

With Degree 0, no conjunctival fold exists. This applies to the state of rest of the eye and does not exclude that a conjunctival fold is pushed ahead of the lower eyelid when the eye is being closed.

**Table 1**

Classification of LIPCOF modified according to Höh et al.

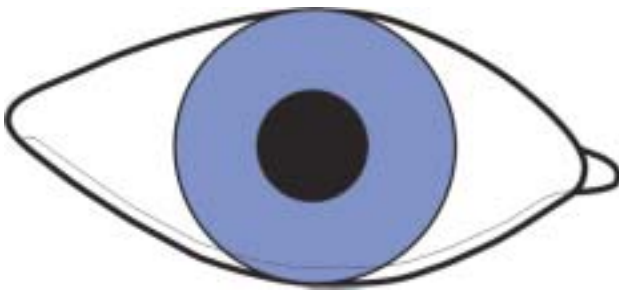
Degree of intensity of LIPCOF	Description of the finding of the conjunctival fold in primary position	Interpretation /Intensity of the dry eye syndrome
Degree 0	No permanently present fold	No dry eye
Degree 1	Single, small fold; smaller than the normal tear meniscus	Mild intensity of dry eye
Degree 2	Fold of up to the height of the normal tear meniscus, multiple folds	Moderate intensity of dry eye
Degree 3	Fold being higher than the normal tear meniscus, multiple folds	Severe intensity of dry eye

LIPCOF Degree 1 describes the permanent presence of an individual fold, which does not exceed the height of the normal tear meniscus. With Degree 2, because of a higher volume, the LIPCOF disintegrates into two or several small parallel folds, which however are lower than the normal tear meniscus. If there are several, parallel conjunctival folds exceeding the height of the normal tear meniscus, LIPCOF Degree 3 exists. The lower limit value for the height of the normal tear meniscus amounts to 0.2 mm.

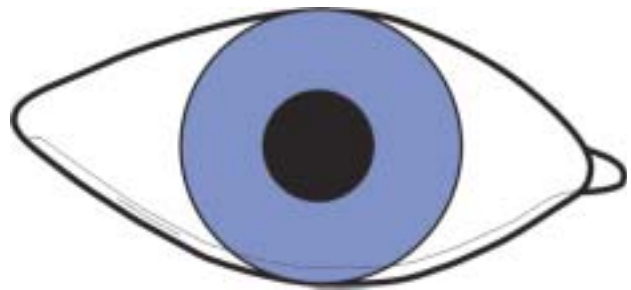
#### Slit-lamp Microscopic Assessment of LIPCOF

LIPCOF can be found nasally, centrally and temporally on both the upper and the lower eyelid. They border on the posterior lid edge running parallel to it. Most frequently, the LIPCOF appear inferiorly temporal. For this reason, this quadrant of the palpebral fold is examined with the slit lamp.

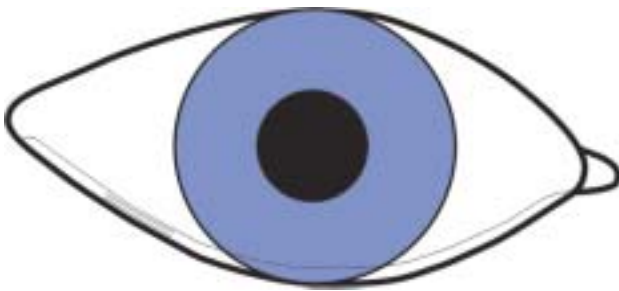
The examination is performed on the non-manipulated eye in primary position. It is advisable to use a micrometer eyepiece for reading the height of the LIPCOF.



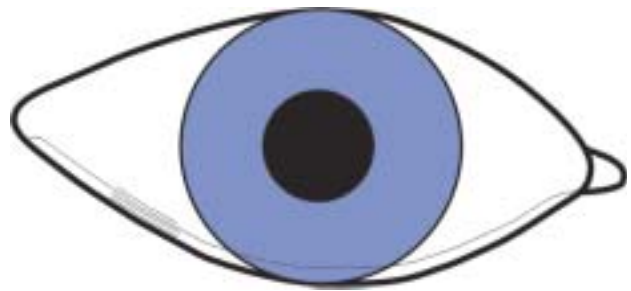
LIPCOF Degree 0  
No permanently present fold



LIPCOF Degree 1  
Single, small fold; smaller than the normal tear meniscus

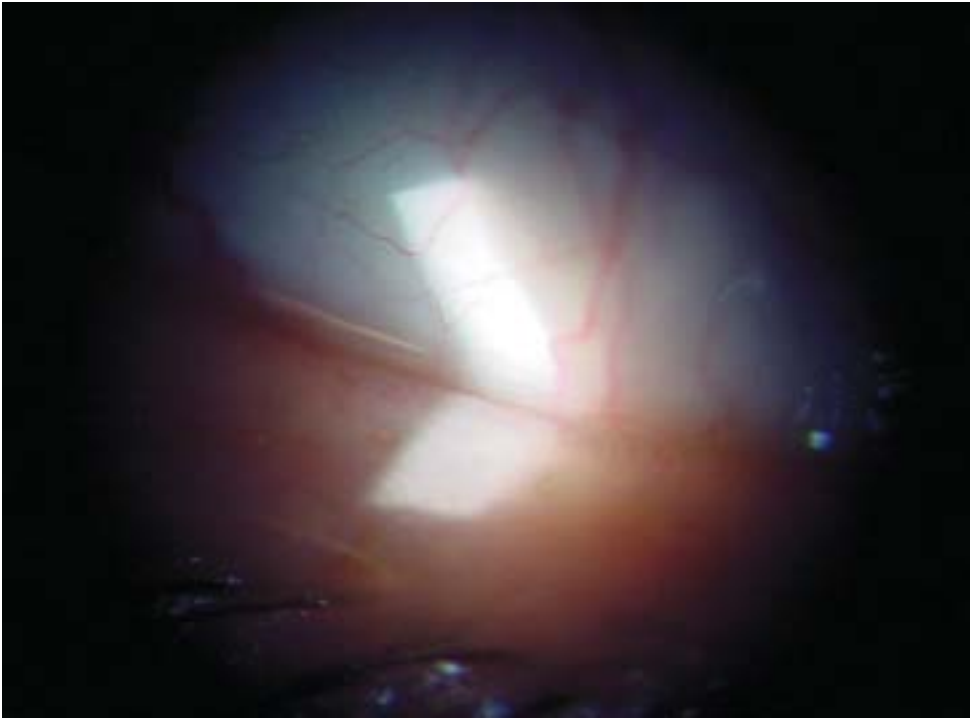


LIPCOF Degree 2  
Fold of up to the height of the normal tear meniscus,  
multiple folds

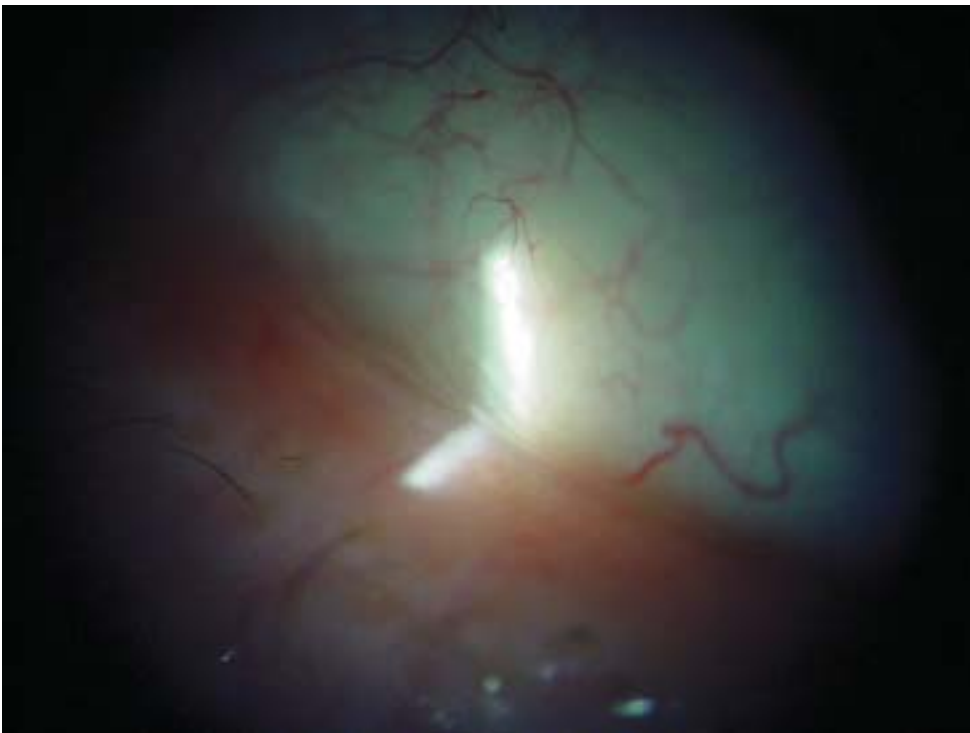


LIPCOF Degree 3  
Fold being higher than the normal tear meniscus, multiple  
folds

**Fig. 1**  
*Schematic diagram of LIPCOF degrees*



**Fig. 2**  
*Test person with LIPCOF Degree 1. A single, small fold is visible.*



**Fig. 3**  
*In this test person, a multiple-fold LIPCOF is present; the height of the normal tear meniscus is not exceeded. LIPCOF Degree 2 can be diagnosed.*

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