Peter Abel-Preis 2009

The Predictive Ability of Clinical Tests for Dry Eye in Contact Lens Wear

Dr. Heiko Pult, Dr. Christine Purslow, Dr. Paul J Murphy

KL-Anpassung

- Ausführliche Anamnese
- Qualifizierte objektive Untersuchung
- Optimale Anpassung der Kontaktlinsen

30% aller Neu-Kontaktlinsenträger steigen nach einem Jahr aufgrund Trockenheitsproblemen aus

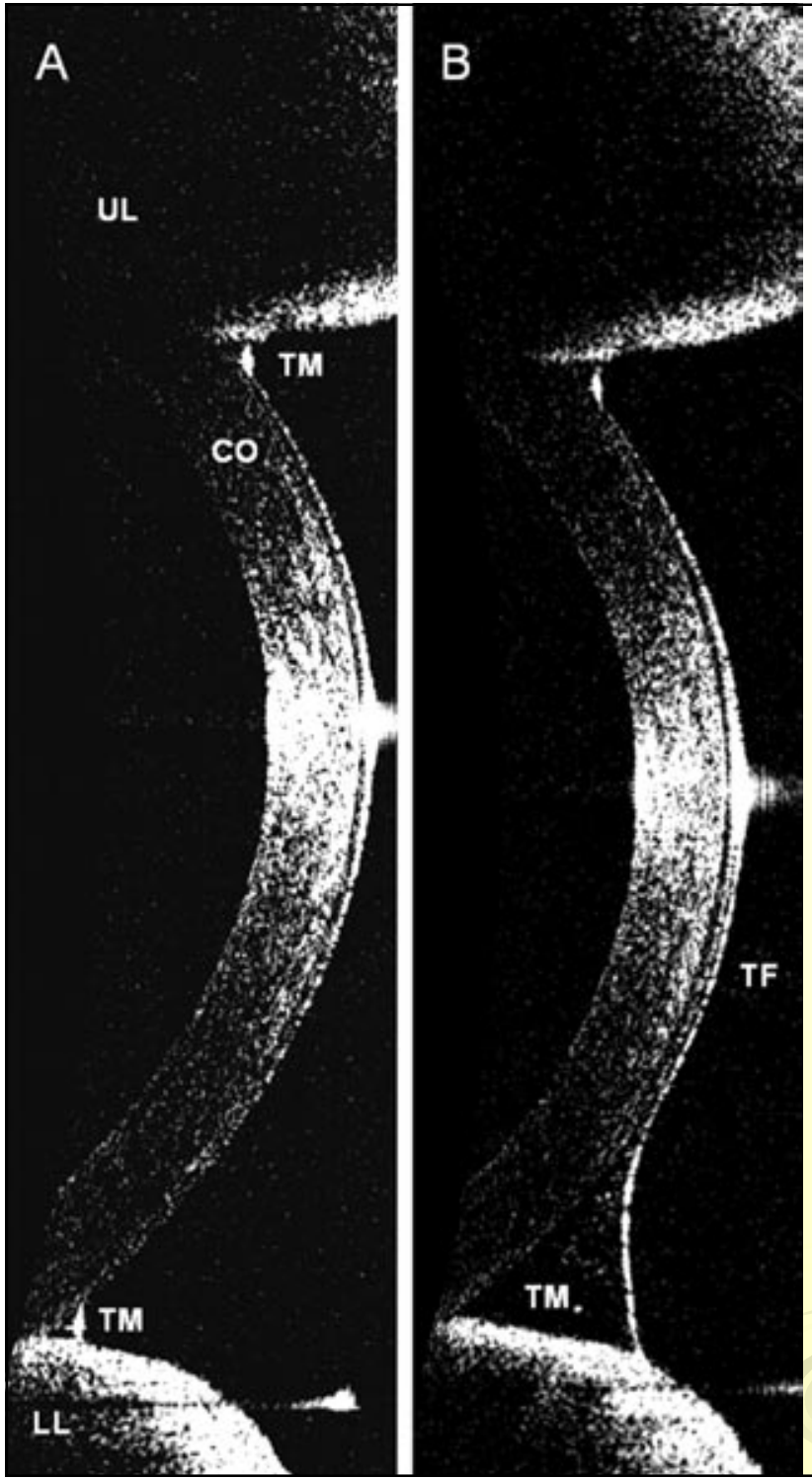
40-50% aller KL-Träger leiden unter Kontaktlinsen-induziertem trockenen Augen

Pritchard, N. et al (1999/2001); Young G. et al (2002)

Probleme

- Prognose der Symptome bei Neu-Linsenträger
  - Optimierte Initial-Versorgung
- Tickende Zeitbomben erfahrener KL-Träger
  - Nachjustierung mittels Neu-Versorgung

- Kein funktionierenden Test!



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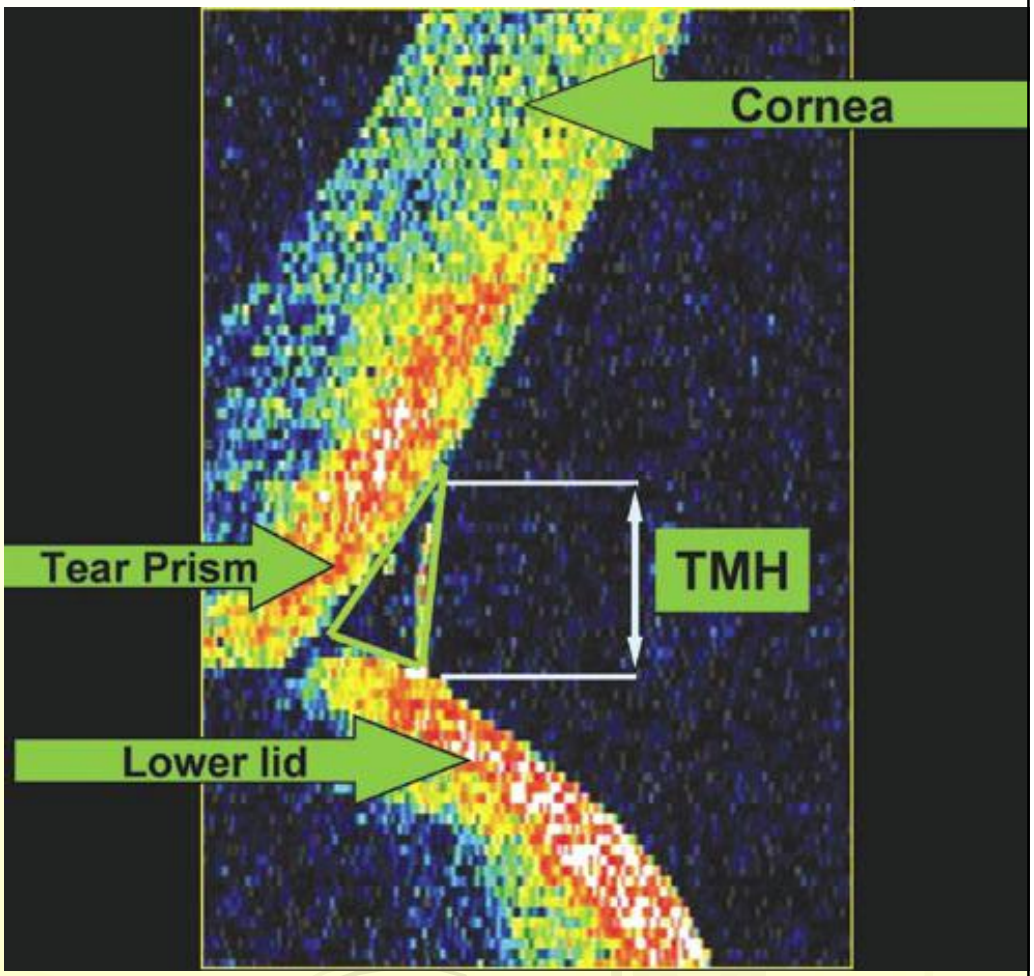
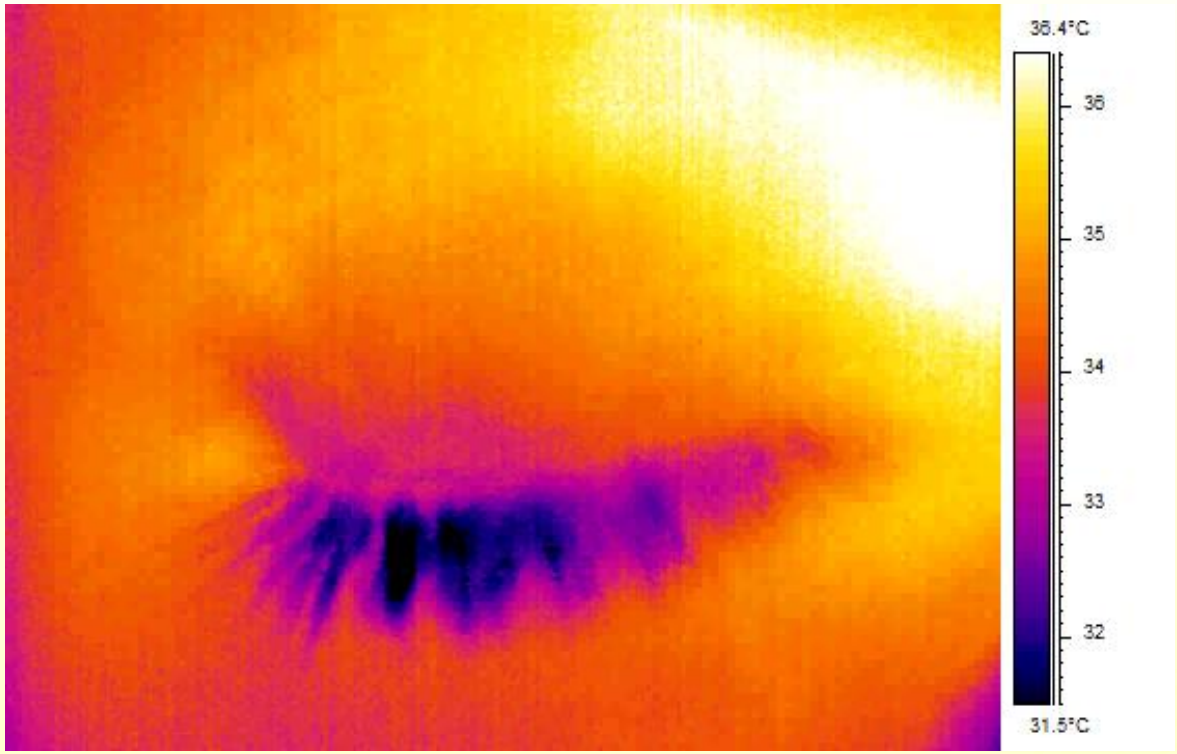



36.4°C
36
35
34
33
32
31.5°C

Forschungs-Projekt Zielsetzung:

Die Entwicklung vorhersagewahrscheinlicher Tests zum trockenem Auge beim KL-tragen für uns Praktiker

Dr. Heiko Pult, Dr. Christine Purslow, Dr. Paul J Murphy

Vorgehensweise

1. Überprüfung unseres „Handwerkszeugs“
2. Was zeigen erfahrenen Kontaktlinsenträgern
3. Passt das zur Immunologie des Tränenfilms / aktuellen Grundlagenforschung?
4. Was zeigen Nicht-Kontaktlinsenträgern, also potentiellen KL-Kunden ?
5. Was muss der Anpasser vor der Anpassung sehen um spätere Symptome des trockenen Auges beim KL-Tragen vorhersagen zu können?

Intern. Standard

- randomisiert
- maskiert
- wenn notwendig Kontrollgruppe
- Ermittlung der Menge der Testpersonen mittels Power Kalkulation
- Deklaration of Helsinki
- Publikation in einem peer-reviewed & Medline zitierten Journal,
- etc.

Vorgehensweise

Ocular Hyperaemia

P-Test: Prediction of CLIDE in Naive CL-Wearers

CLIDE-Index in Experienced Lens Wearers

Inter-Observer Agreement

LWE & LICPOF in Non-CL-Wearers

Mucins in Asymptomatic and Symptomatic CL-Wearers

Final Conclusion

Relation Between LWE & LIPCOF and Predictability in CL-Wearers

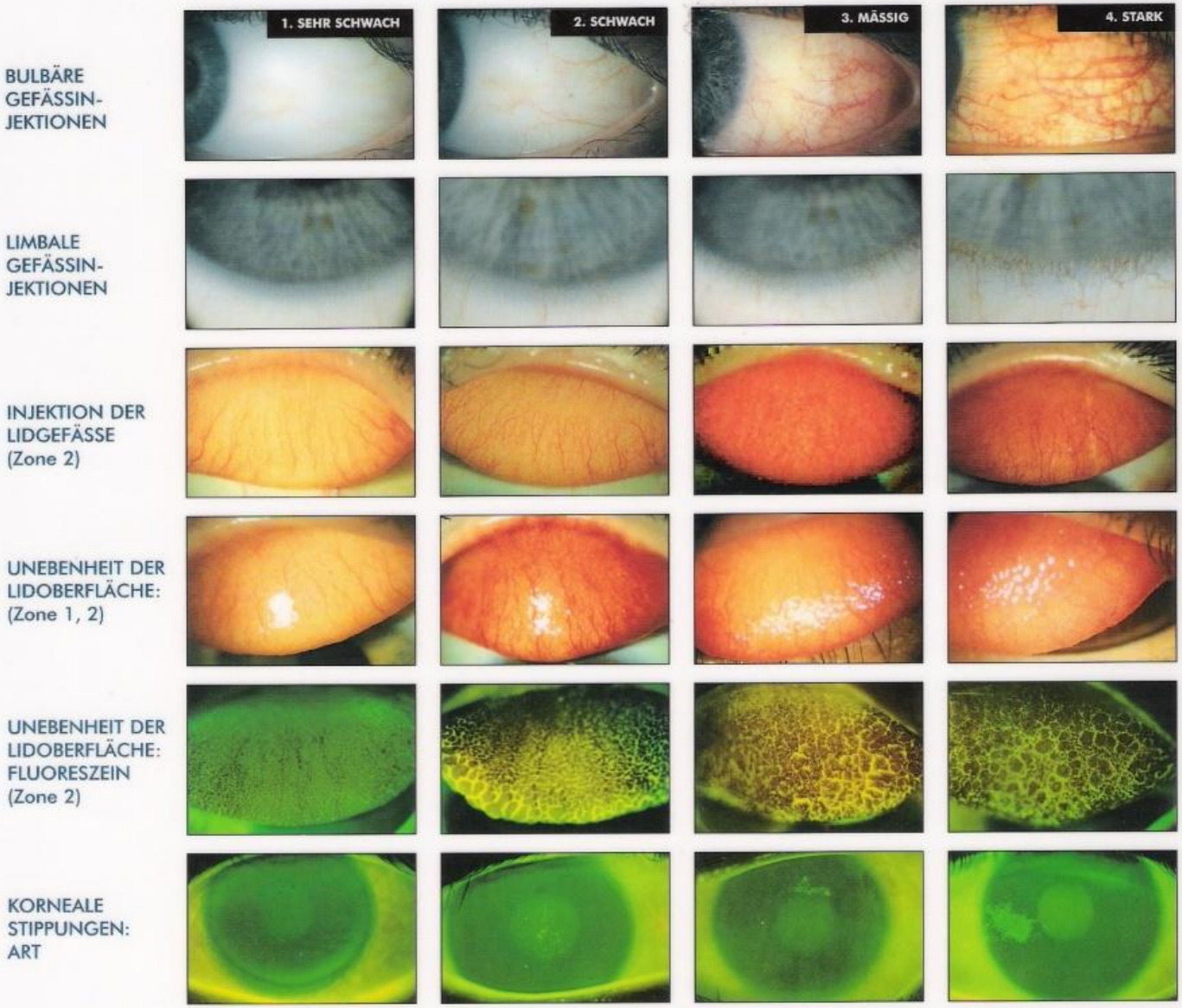
Mucins Sample Colection & Analyses

www.heiko-pult.de

Handwerkszeug

CCLRU GRADING SCALES

Cornea and Contact Lens Research Unit, School of Optometry, University of New South Wales



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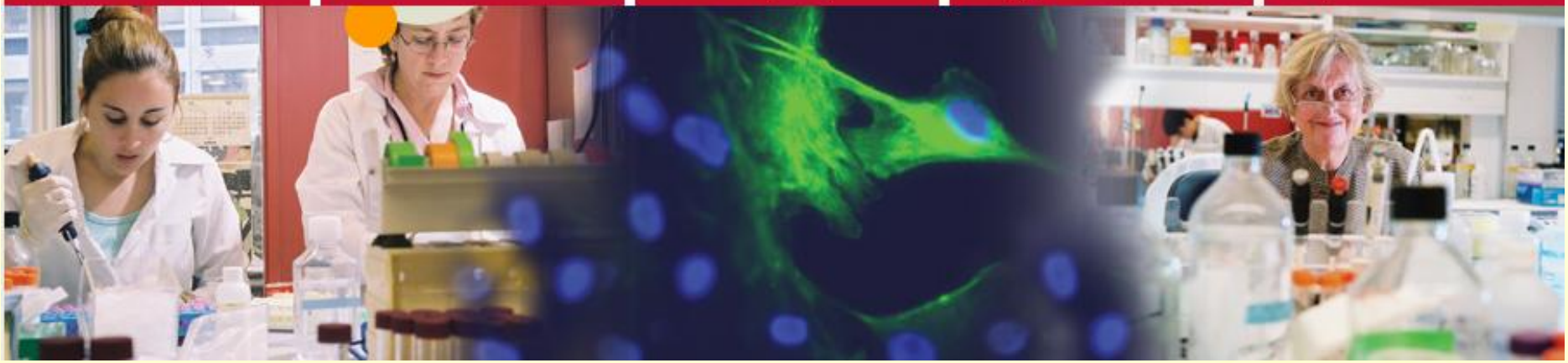
Schepens Eye Research Institute

An affiliate of Harvard Medical School

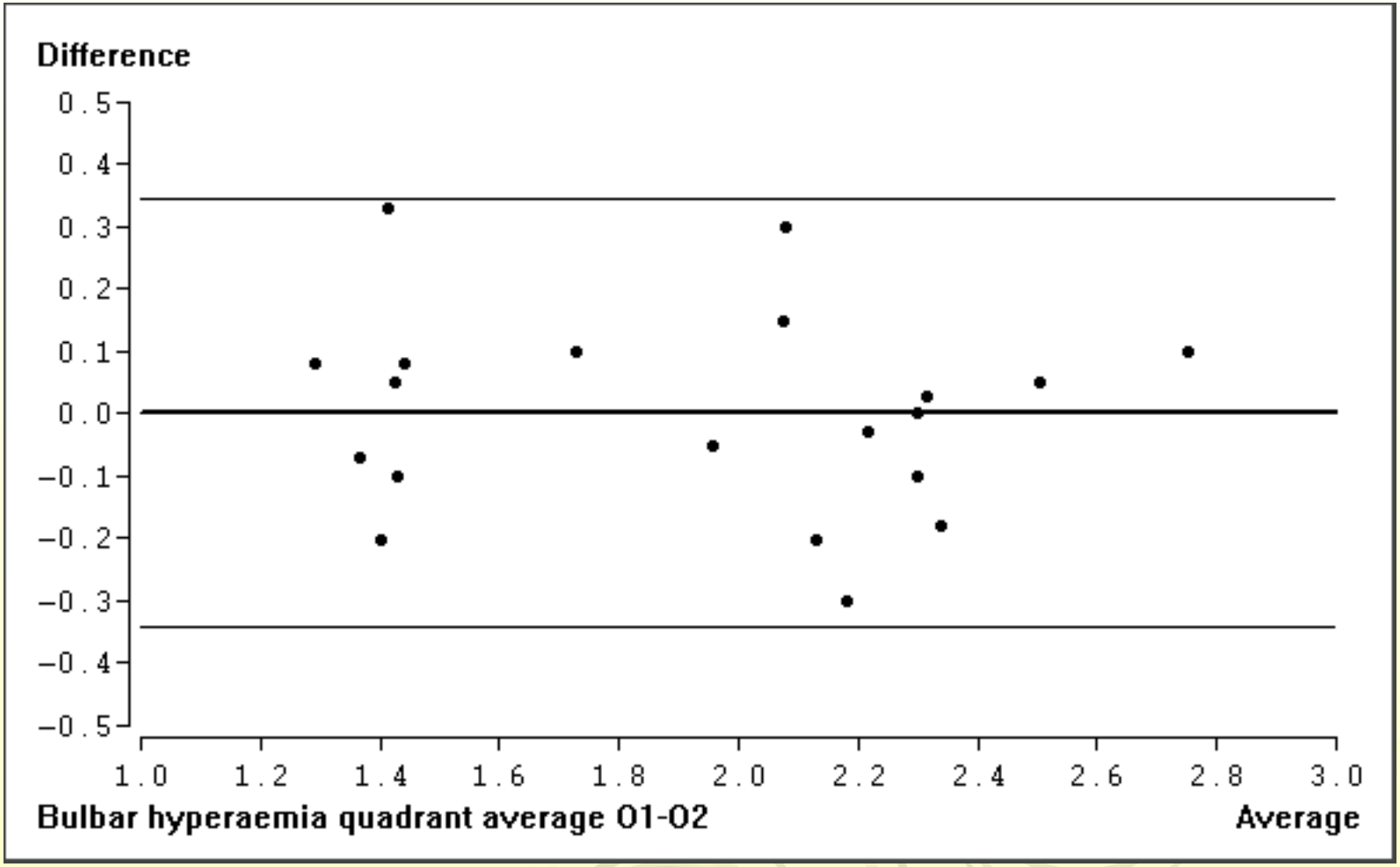
Working to preserve and restore vision—today, tomorrow, and into the future

The eye | Our research | Our people | Support research | Corporate alliances

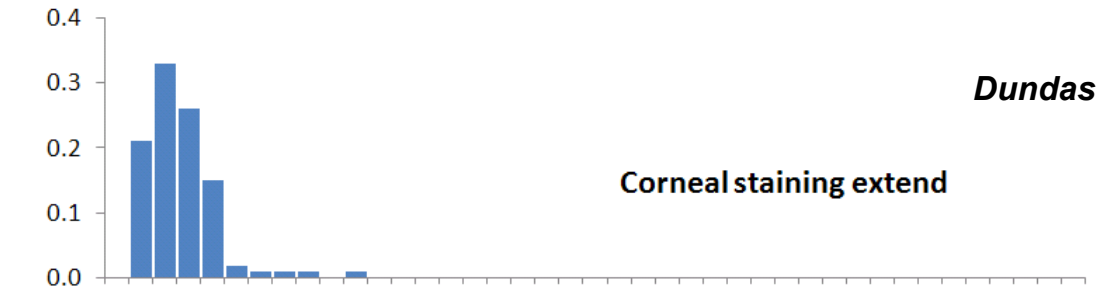


Harvard University, USA

Exakt & wiederholbar

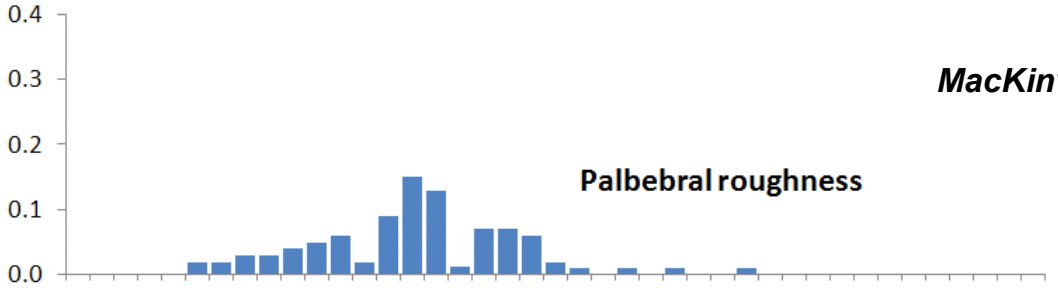


95% Limit of Agreement, Bland & Altman; 0.28, quadrant average



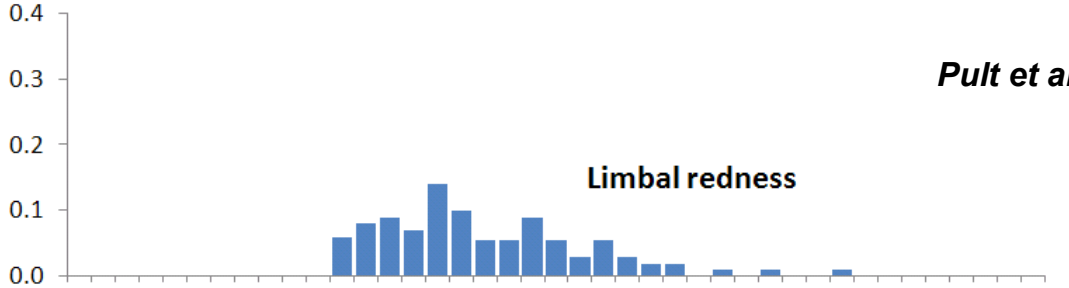
Dundas et al

Corneal staining extend



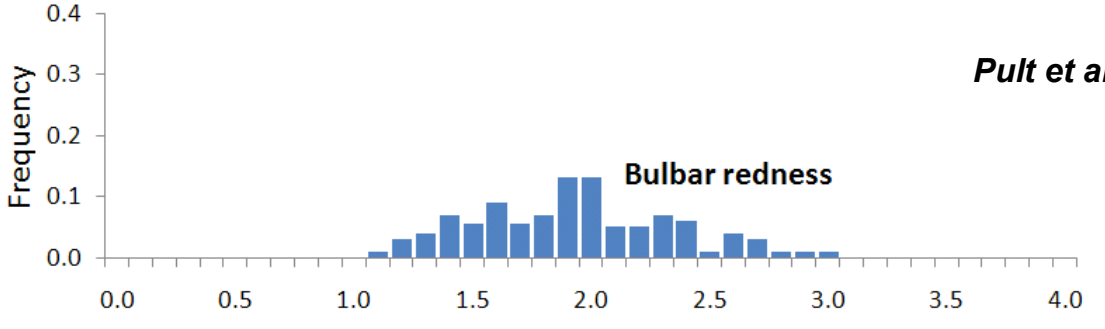
MacKinven et al

Palbebral roughness



Pult et al

Limbal redness



Pult et al

Bulbar redness

Limbal and Bulbar Hyperaemia in Normal Eyes

Heiko Pult[1], Paul J. Murphy[1], Christine Purslow[1], Jeffrey Nyman[2] and Russell L. Woods[3]

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Abstract

Purpose: To investigate the appearance of limbal and bulbar hyperaemia in normal eyes, their relationship and the inter-observer agreement of clinical grading.

Methods: The right eyes of 120 healthy, non-contact lens-wearing subjects (m = 57, f = 63, median age = 45 years, range 18–77 years) were examined by two trained observers. Limbal and bulbar hyperaemia were scored using the Cornea and Contact Lens Research Unit (CCLRU) redness grading scales interpolated into 0.1 increments. Redness of four quadrants, and overall, were assessed, and quadrant-average redness was calculated. Inter-observer agreement was assessed at the start and end of the study (20 subjects each).

Results: For limbal redness, the overall (1.62 ± 0.46) (mean units ± S.D.) was not significantly different from the quadrant-average (1.61 ± 0.40) score. For bulbar redness, the overall (2.02 ± 0.49) was higher than the quadrant-average (1.82 ± 0.39) score ($p < 0.0001$). Significant correlations were found between bulbar and limbal quadrants (Pearson: $r \geq 0.43$, $p < 0.0001$). Significant differences in redness were found between quadrants ($p < 0.0001$), with nasal and temporal redder than superior and inferior quadrants. Small effects of age and gender were found for limbal redness. The inter-observer 95% limits of agreement were similar at the start and end of the study. They were larger for overall (0.57) compared with quadrant-average (0.28) redness.

Conclusions: For similar populations, a limbal redness above 2.5 or a bulbar redness above 2.6 (quadrant-average) or 3.0 (overall) may be considered abnormal. Limbal and bulbar redness were correlated. Quadrant-average scores are recommended instead of overall scores, as inter-observer agreement was better.

Keywords: bulbar hyperaemia, bulbar redness, clinical grading, limbal hyperaemia, limbal redness, normal

Ophthalmic and Pyhsiological Optics (*Februar 2008)*

Erfahrene Kontaktlinsenträger

ORIGINAL ARTICLE

Clinical Tests for Successful Contact Lens Wear: Relationship and Predictive Potential

Heiko Pult*, Christine Purslow†, Monica Berry†, and Paul J. Murphy‡

ABSTRACT

Purpose. Although comfort is important for contact lens wearers, common clinical tests can fail to predict patients' symptoms. Lid wiper epitheliopathy (LWE) and lid parallel conjunctival folds (LIPCOF) are related to dry eye symptoms in lens wearers. This study investigates the predictive value of LWE and LIPCOF as objective measures of discomfort, and their relation to the ocular surface in soft contact lens wearers.

Methods. Subjects were classified as symptomatic or asymptomatic, using the Contact Lens Dry Eye Questionnaire (CLDEQ). Pre lens tear break up time (PLBUT), limbal and bulbar hyperaemia, corneal staining, LWE and LIPCOF were assessed in the right eyes of 61 (23 M, 38 F; mean age 32.7 years; range = 18 to 56) experienced contact lens wearers. Differences between groups, and relationships between LWE, LIPCOF (nasal, temporal and sum) and objective signs were examined using non-parametric analyses. The positive and negative predictive values for symptoms of each objective measure were calculated.

Results. Thirty eight subjects were classified as asymptomatic, 23 symptomatic. LWE and LIPCOF severity scores were significantly increased in symptomatic patients (U-test, $p < 0.03$), while no significant differences were found between groups for PLBUT, corneal staining or hyperaemia ($0.29 < p < 0.86$). Significant positive correlations were found between LWE and LIPCOF scores (temporal $r = 0.67$, $p < 0.001$; nasal $r = 0.49$, $p < 0.001$), and between LWE and hyperaemia (bulbar, $r = 0.28$, $p < 0.001$; limbal $r = 0.36$, $p < 0.001$). Age and gender were different in the two groups ($p < 0.05$). The predictive value of temporal LIPCOF was positive = 76.9%, negative = 77.1% with a cutoff value of ≥2 (PPV/NPV/cutoff value), of nasal LIPCOF 70.7%/75.0%/≥1, of LIPCOF Sum 79.8%/86.5%/≥2, and of LWE 53.1%/81.1%/≥1.

Conclusions. Contact lens wearers with dryness symptoms exhibit significantly more LWE and LIPCOF, but not increased corneal staining, bulbar hyperaemia or decreased PLBUT. LWE and LIPCOF are significantly correlated: this may reflect their common frictional origin. LIPCOF Sum severity scores appear to be most predictive for symptoms.

(Optom Vis Sci 2008;85:E924–E929)

Key Words: lid parallel conjunctival folds, conjunctivochalasis, lid wiper epitheliopathy, symptoms, contact lens

Optometry and Vision Sciences (*Oktober 2008)*

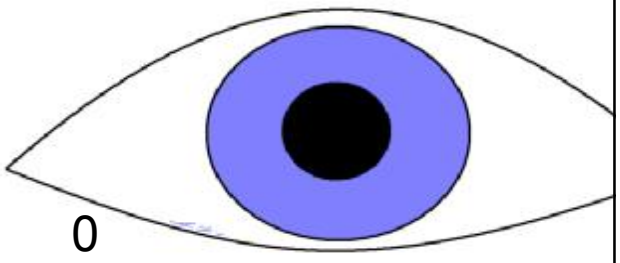
- Lid Wiper Epitheliopathy (LWE) und LIPCOF

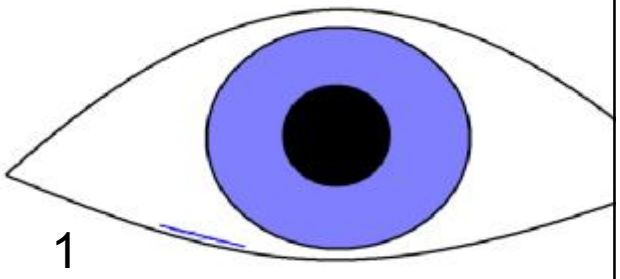
Sickenberger W., Pult H., Sickenberger B. 2000,

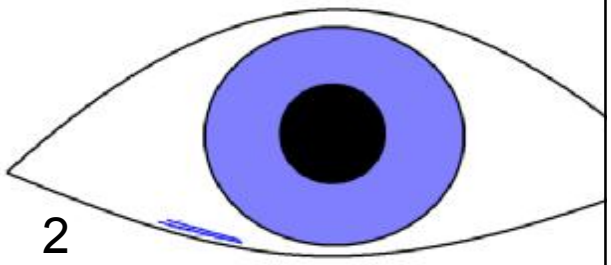
Höh et al 1996, Korb D. et al 2002/05/06

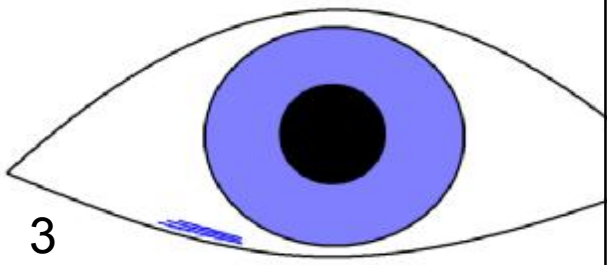
LIPCOF

	LIPCOF degree
Keine conjunctivale Falte	0
Eine parallele, conjunctivale Falte,	1
Zwei parallele, conjunctivale Falten	2
Drei oder mehr parallele, conjunctivale Falten	3



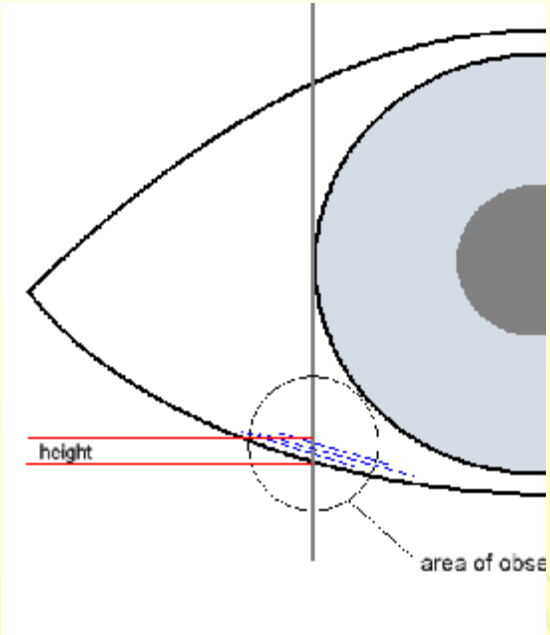




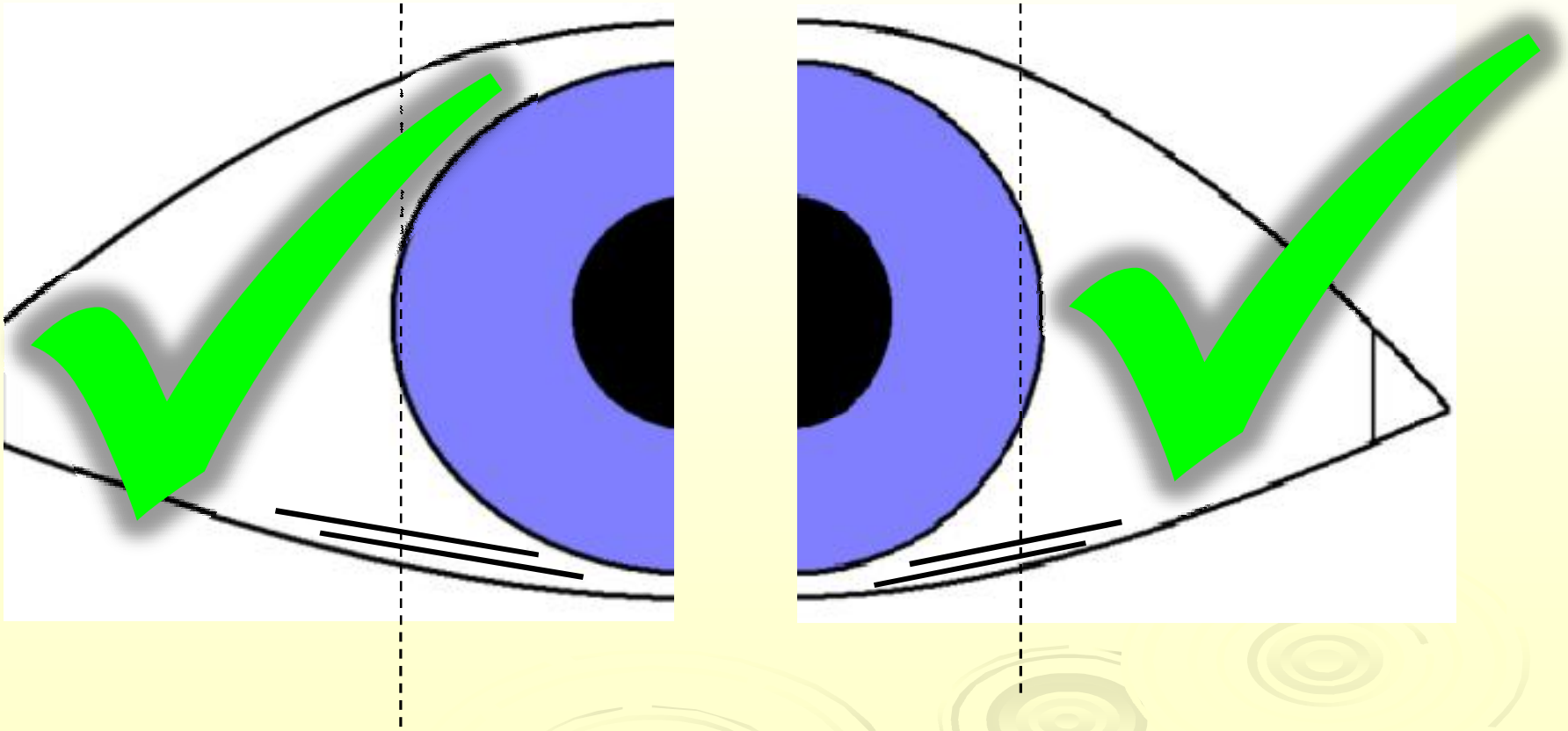


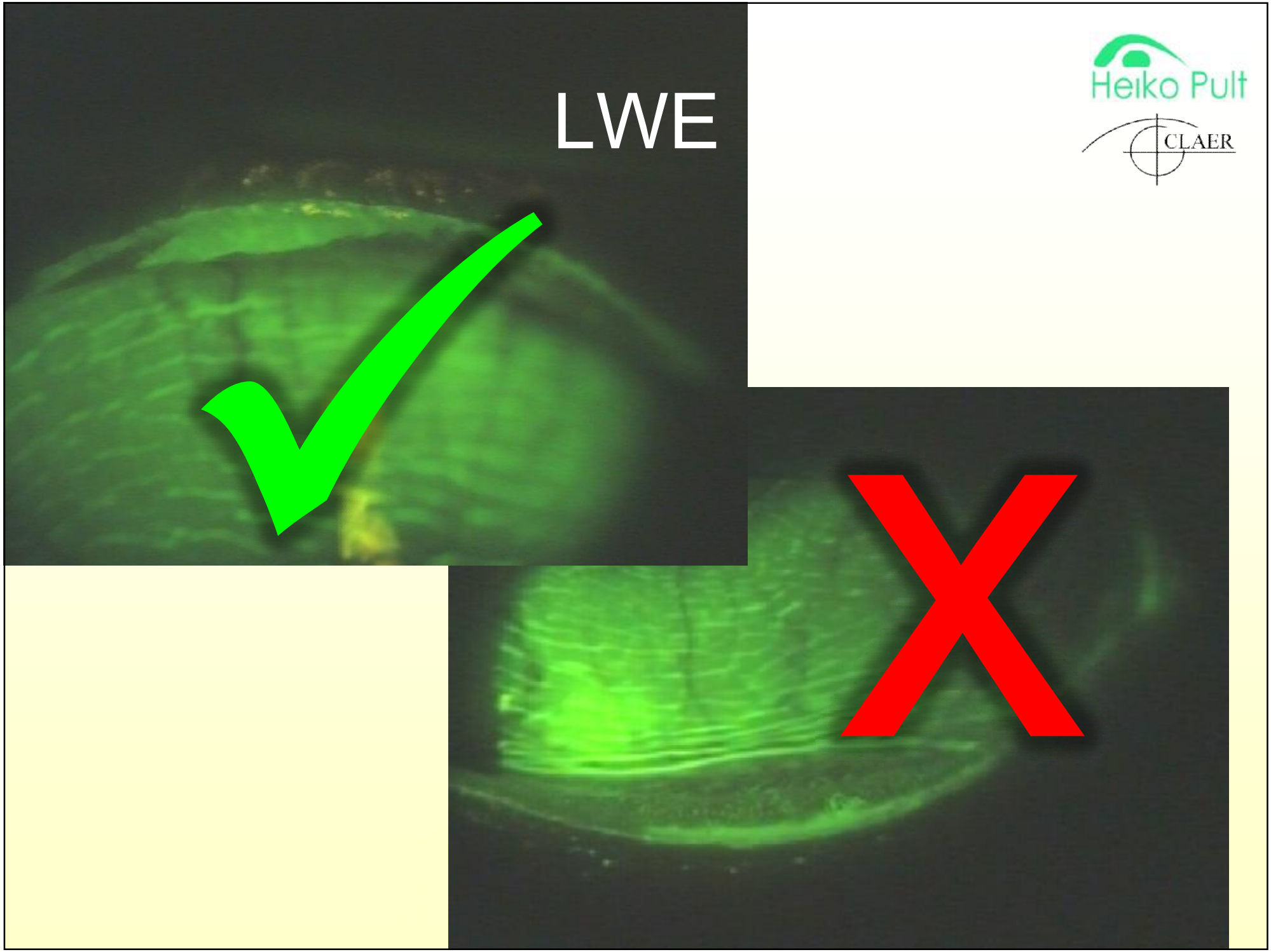
LIPCOF

- Es ist dabei ausserordentlich wichtig zwischen parallelen, permanenten conjunctivalen Falten (**LIPCOF**) und unterbrochenen **Mikrofalten** oder **Conjunctival Flaps** zu unterscheiden!



LIPCOF




LWE
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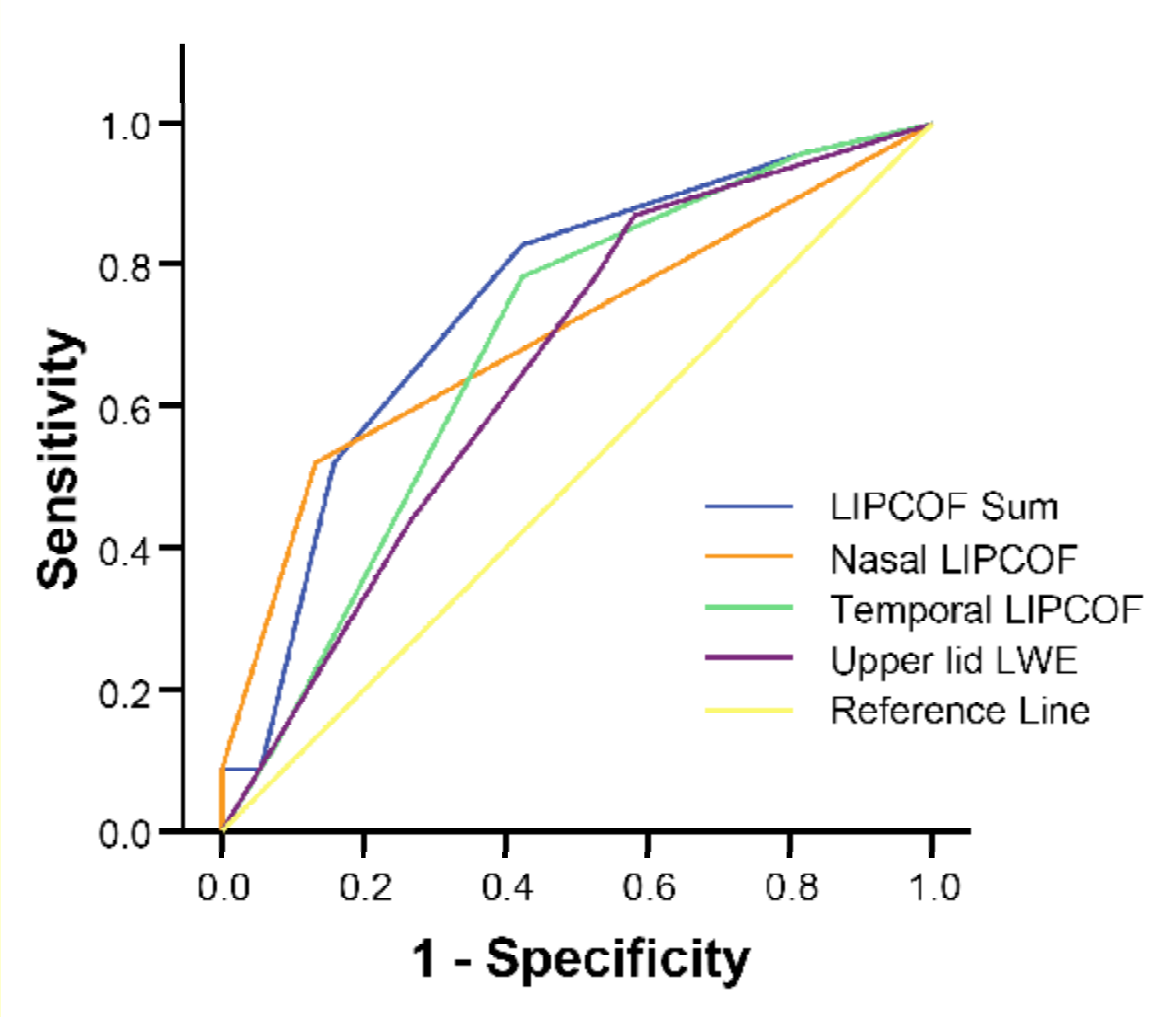
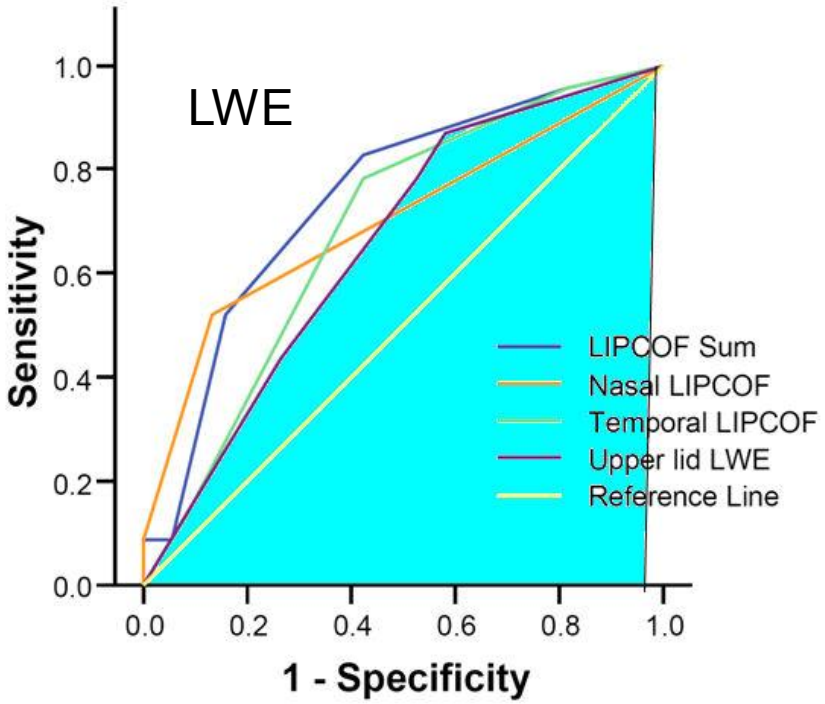
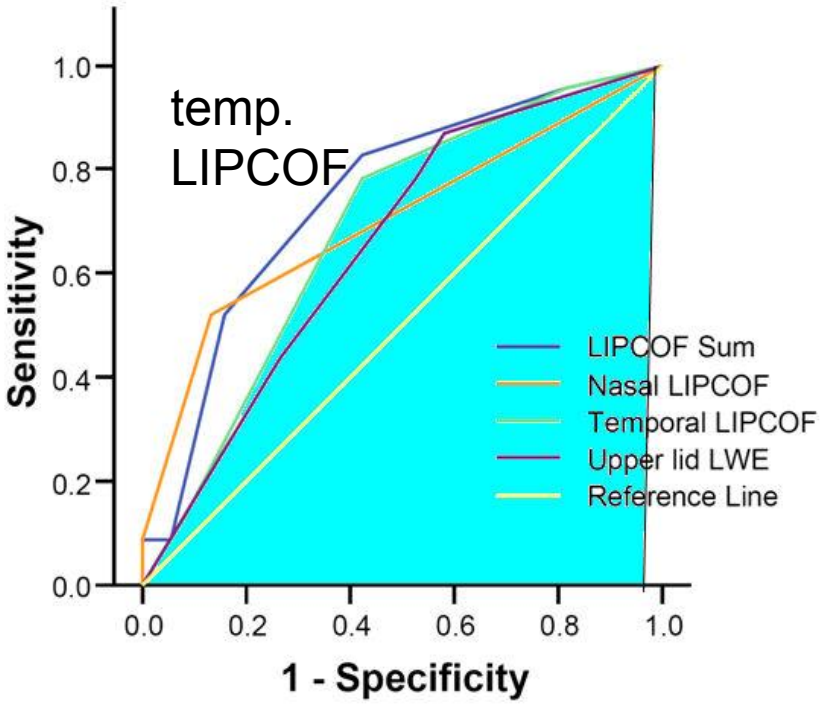
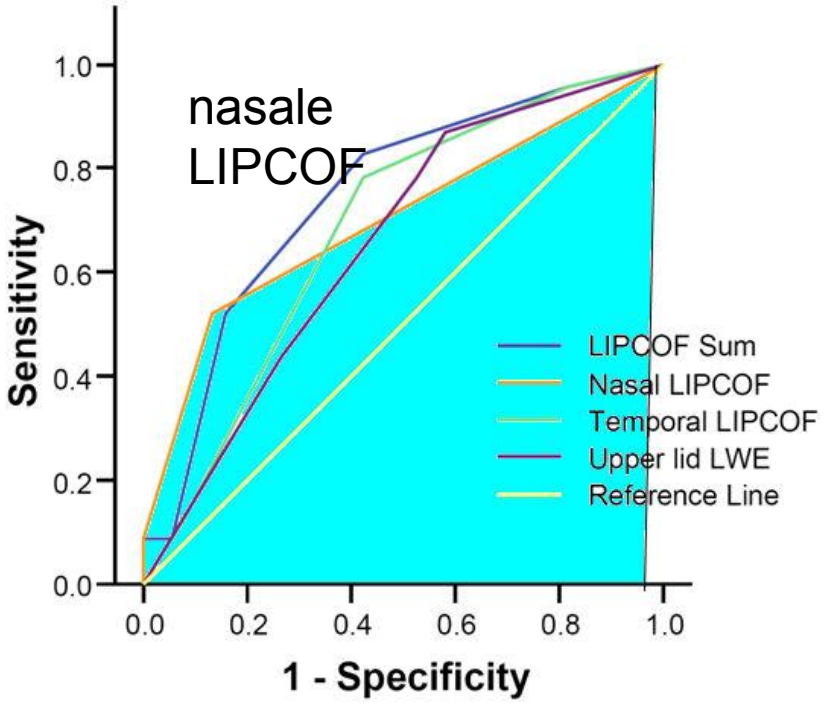
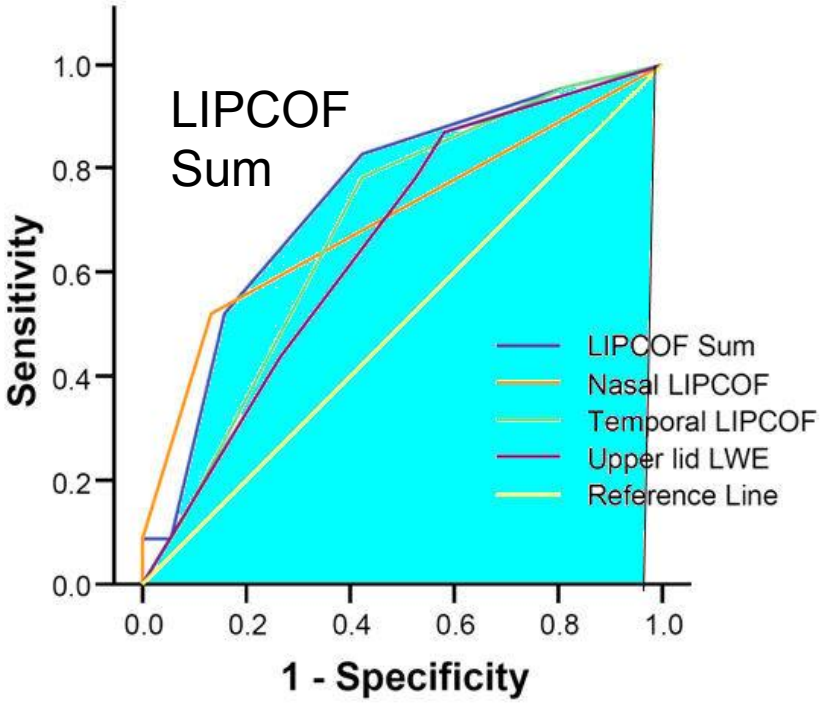
Receiver Operative Characteristic Curve (ROC)




LWE
Sensitivity
1 - Specificity
0.0
0.2
0.4
0.6
0.8
1.0
LIPCOF Sum
Nasal LIPCOF
Temporal LIPCOF
Upper lid LWE
Reference Line

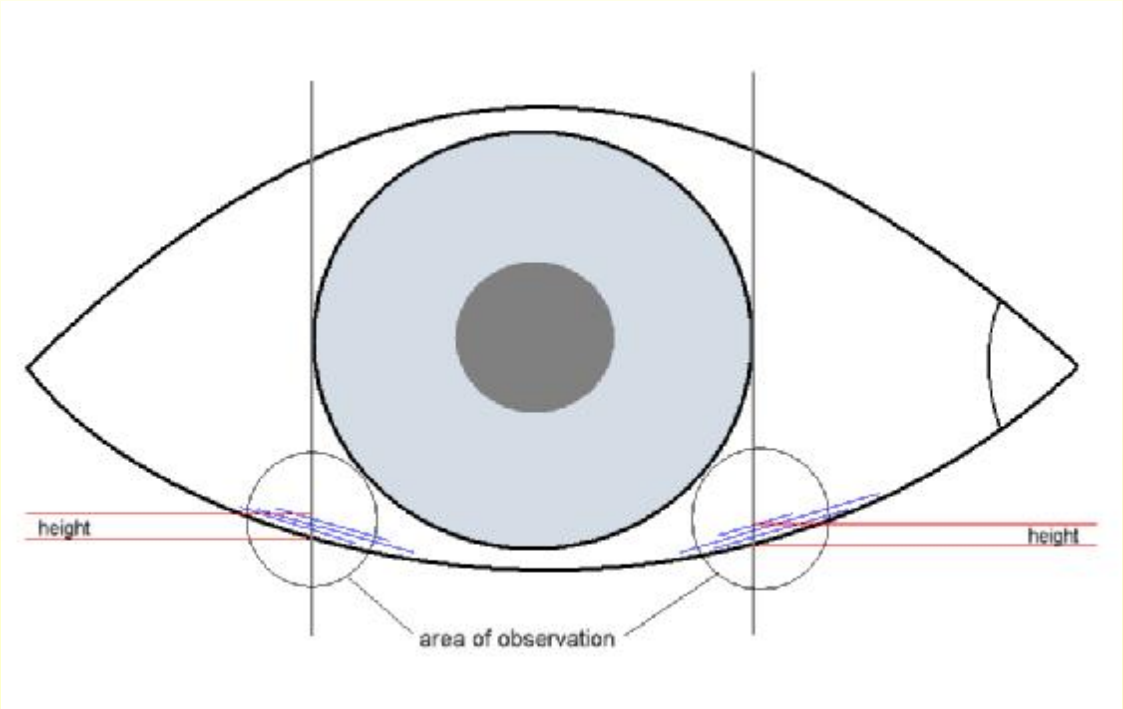

temp.
LIPCOF
Sensitivity
1 - Specificity
0.0
0.2
0.4
0.6
0.8
1.0
LIPCOF Sum
Nasal LIPCOF
Temporal LIPCOF
Upper lid LWE
Reference Line


nasale
LIPCOF
Sensitivity
1 - Specificity
0.0
0.2
0.4
0.6
0.8
1.0
LIPCOF Sum
Nasal LIPCOF
Temporal LIPCOF
Upper lid LWE
Reference Line

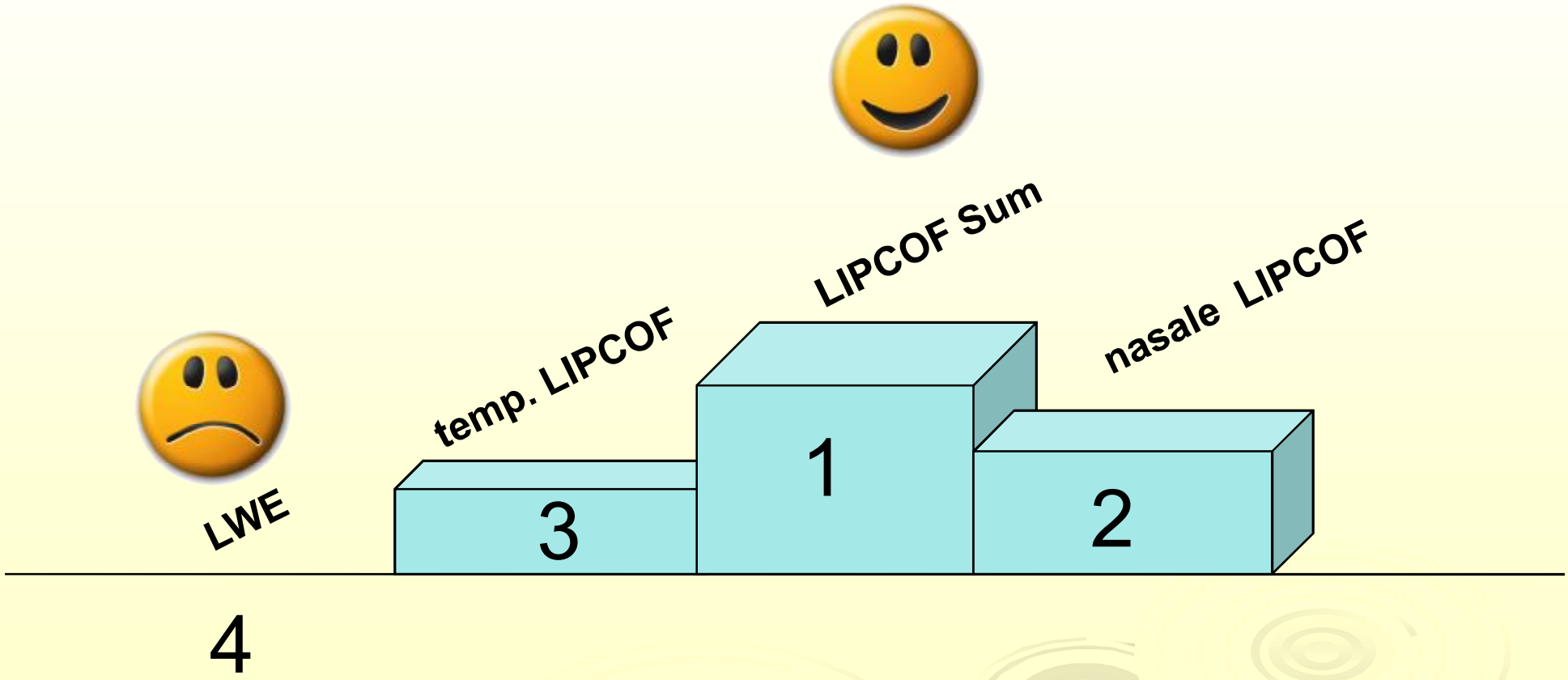

LIPCOF
Sum
Sensitivity
1 - Specificity
0.0
0.2
0.4
0.6
0.8
1.0
LIPCOF Sum
Nasal LIPCOF
Temporal LIPCOF
Upper lid LWE
Reference Line

LIPCOF Sum

LIPCOF Sum = temporal LIPCOF + nasal LIPCOF

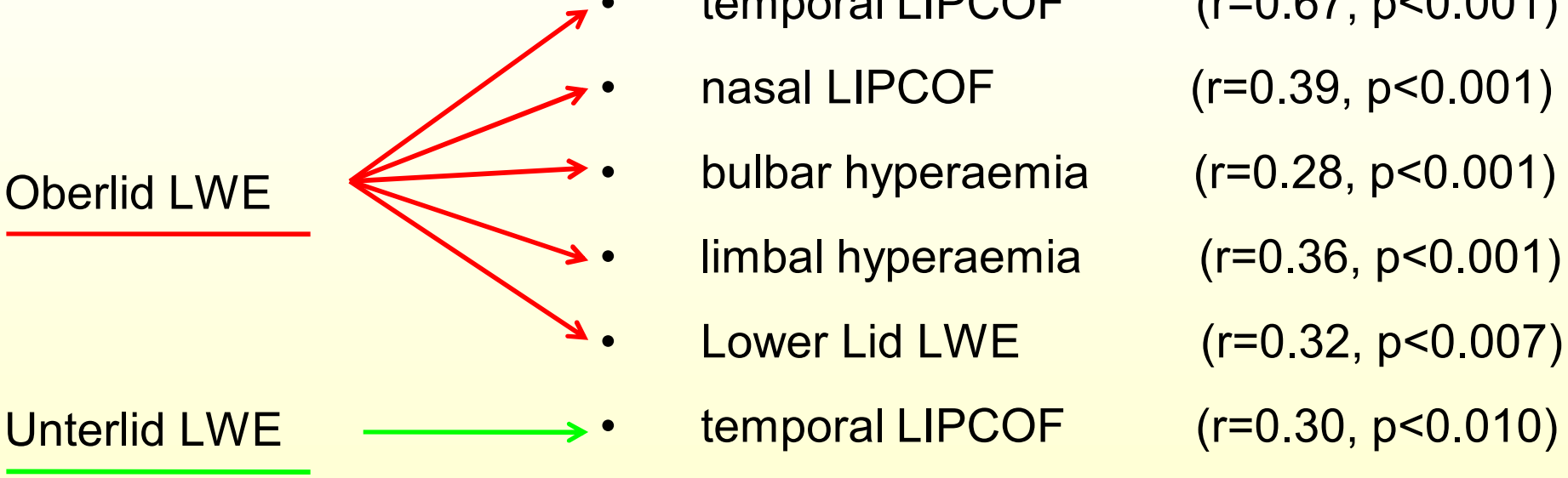


Siegerehrung



Ergebnisse

Signifikante Korrelationen (*Spearman Rank*):



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ORIGINAL ARTICLE

Mucins and Ocular Signs in Symptomatic and Asymptomatic Contact Lens Wear

Monica Berry*, Heiko Pult†, Christine Purslow*, and Paul J. Murphy‡

ABSTRACT

Purpose. Lid wiper epitheliopathy (LWE) and lid parallel conjunctival folds (LIPCOF) are related to dry eye symptoms in contact lens wearers. Both clinical signs are assumed to be related to mechanical forces during blinking. As the mucus layer is a protector of the ocular surface tissue, this study investigates whether any alterations of mucins are detectable comparing symptomatic and asymptomatic soft contact lens wearers.

Methods. Comfort was evaluated using the Contact Lens Dry Eye Questionnaire. Corneal staining, LWE, and LIPCOF were assessed in the right eyes of 50 (19 men, 31 women; mean age, 32.1 ± 11.4 years) experienced lens wearers. The tear film was sampled using Schirmer strips pressed onto the temporal conjunctiva and from harvested contact lenses. Mucins were assessed in dot-blots and Western blots after electrophoresis on 1% agarose or 4 to 12% NuPAGE Gels. Non-parametric analyses were used to study differences between groups and correlations between objective tests, mucins, and symptoms.

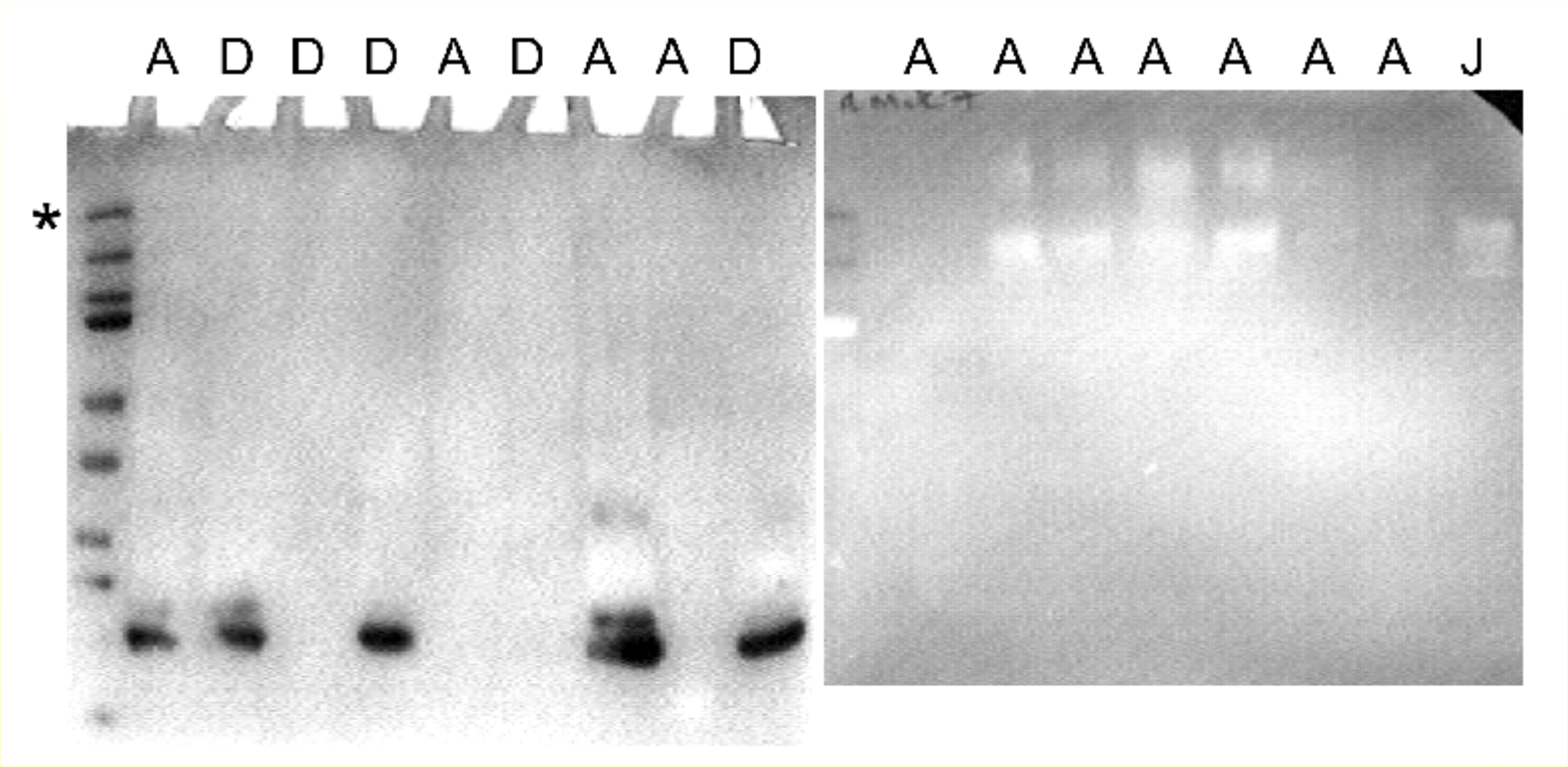
Results. Thirty-one subjects were classified asymptomatic and 19 symptomatic by the questionnaire. LWE and LIPCOF were significantly increased in the symptomatic group ($p < 0.03$). MUC5AC reactivity was significantly decreased in symptomatics ($p = 0.050$). MUC4 was correlated to temporal LIPCOF and LWE, ($r = 0.47$ and 0.46; $p < 0.01$). MUC16 and MUC5AC correlated with corneal staining ($0.36 < r < 0.43$; $p < 0.04$).

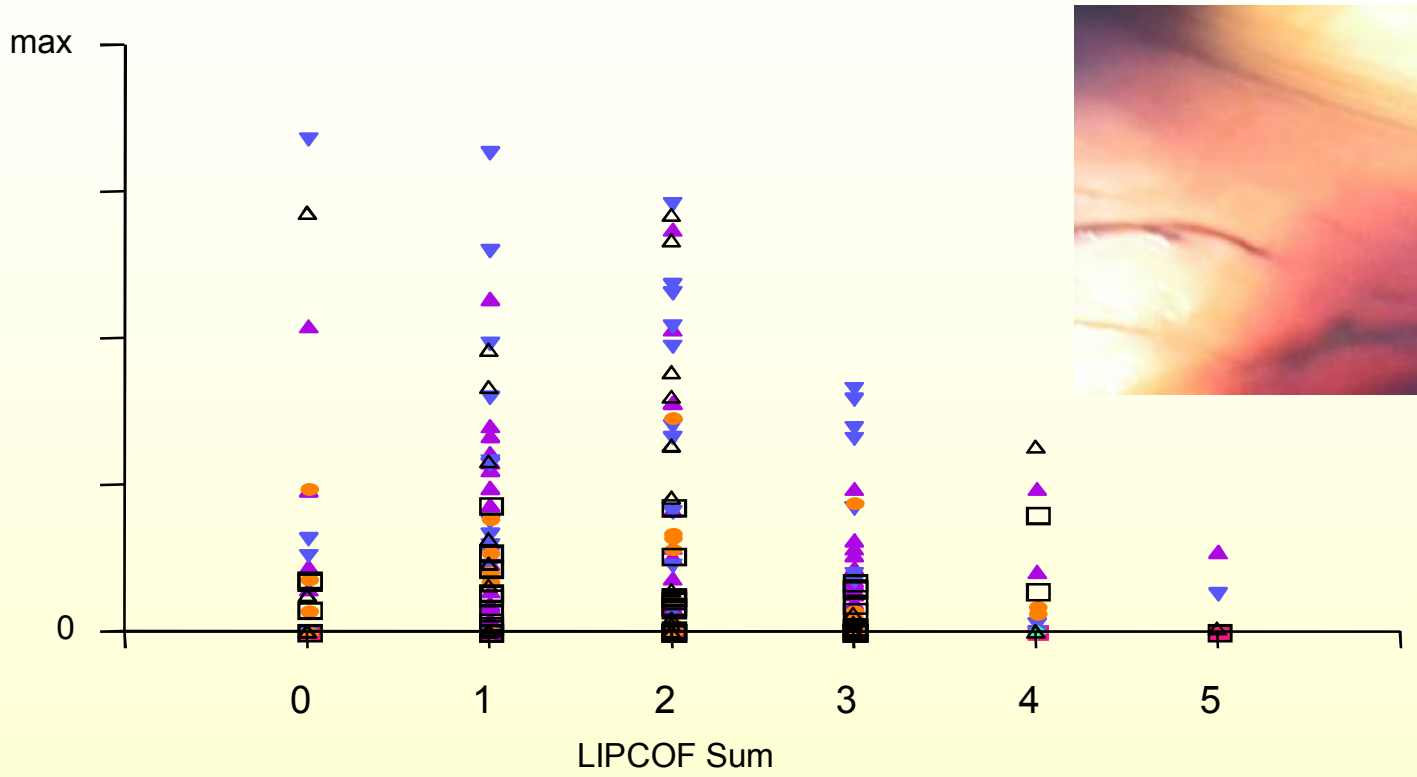
Conclusions. Symptomatic contact lens wearers exhibit significantly more LWE and LIPCOF, and decreased MUC5AC reactivity. LWE and LIPCOF are significantly correlated; this may reflect their common lid wiper origin. Increased friction might follow from insufficient mucins, or an altered composition of the resident mucins at the ocular surface. In this study, we show that decreased mucin production is associated with the severity of LWE and LIPCOF.

(Optom Vis Sci 2008;85:E930–E938)

Key Words: contact lens, lid parallel conjunctival folds, lid wiper epitheliopathy, mucins, symptoms

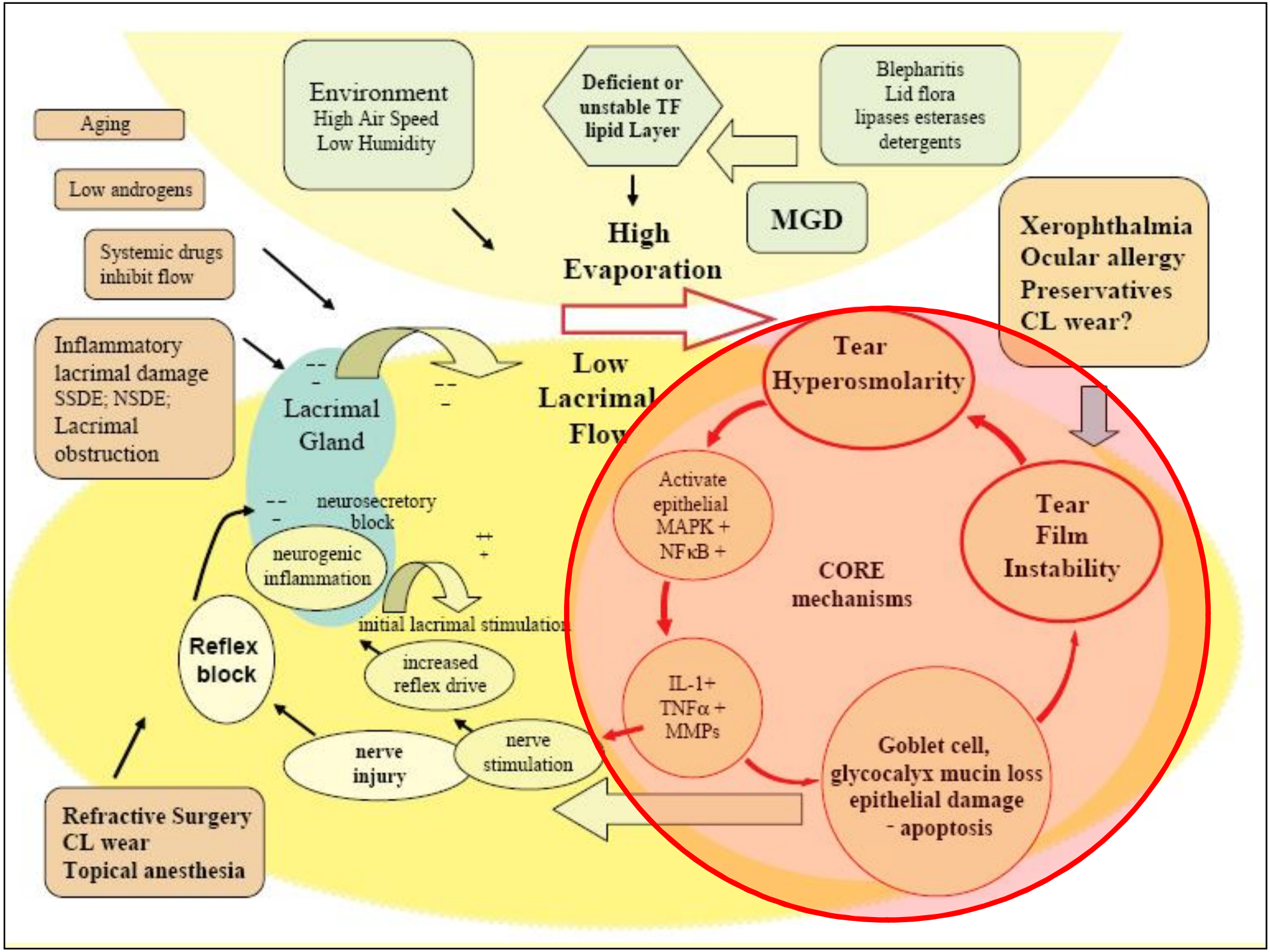
Optometry and Vision Sciences (*Oktober 2008)*


A D D D A D A A D
A A A A A A A J
*



Je weniger Muzine, umso mehr LIPCOF Sum

Passt das in das aktuelle wissenschaftl. Grundmodell?


Environment
High Air Speed
Low Humidity
Deficient or unstable TF lipid Layer
Blepharitis
Lid flora
lipases esterases
detergents
MGD
Aging
Low androgens
Systemic drugs inhibit flow
Inflammatory lacrimal damage SSDE; NSDE; Lacrimal obstruction
High Evaporation
Xerophthalmia
Ocular allergy
Preservatives
CL wear?
Lacrimal Gland
Low Lacrimal Flow
Tear Hyperosmolarity
Activate epithelial MAPK + NFκB +
Tear Film Instability
CORE mechanisms
neurosecretory block
neurogenic inflammation
initial lacrimal stimulation
Reflex block
increased reflex drive
IL-1+ TNFα + MMPs
nerve injury
nerve stimulation
Goblet cell, glycocalyx mucin loss epithelial damage - apoptosis
Refractive Surgery
CL wear
Topical anesthesia

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CLAER

Hyperosmolarität

Tränenfilm-Instabilität

Kern Mechanismus

Zytokine

Muzin-Mangel aufgrund zu geringer Epithelz

Neu-Linsenträger

ORIGINAL ARTICLE

A Novel Method to Predict the Dry Eye Symptoms in New Contact Lens Wearers

Heiko Pult*, Paul J. Murphy*, and Christine Purslow†

ABSTRACT

Purpose. Lid wiper epitheliopathy (LWE) and lid parallel conjunctival folds (LIPCOF) give moderate prediction levels for dryness symptoms in experienced contact lens (CL) wearers. This study investigated whether a combination of LWE and LIPCOF plus other tear film tests and subjective evaluation before contact lens fitting was better able to predict CL-induced dry eye (CLIDE) symptoms.

Methods. Tear meniscus height, non-invasive break-up time (NIBUT), ocular hyperaemia, LIPCOF, phenol red thread test, corneal and conjunctival staining, and LWE of the right eye of 33 new soft CL wearers (12 males, 21 females, median age = 30.5 years; range = 19 to 44) were assessed in a prospective 2-mo longitudinal study. Symptoms were evaluated by the Ocular Surface Disease Index (OSDI) and subjects were grouped according to their response in the Contact Lens Dry Eye Questionnaire (CLDEQ) during the study (20 symptomatic and 13 asymptomatic). The subjects were fitted with vifilcon A and senofilcon A lenses for a 2-week period, consecutively.

Results. Limbal hyperaemia (repeated measures analysis of variance; $p < 0.05$) and LWE (Friedman; $p < 0.004$) increased significantly during the study but not LIPCOF ($p \geq 0.318$; temporal, nasal, and Sum), bulbar hyperaemia ($p = 0.432$), staining ($p \geq 0.060$), OSDI ($p = 0.126$), or CLDEQ ($p = 0.317$, $\kappa = 0.279$). Limbal hyperaemia significantly decreased in senofilcon A lenses. Wearing comfort among symptomatics was significantly better with senofilcon A ($p = 0.005$). At the enrolment visit, the subjects who became symptomatic exhibited significantly decreased NIBUT and increased LIPCOF and OSDI (range, $p < 0.027$). The best test combination to predict CLIDE (logistic regression analyses) was LIPCOF Sum plus NIBUT and OSDI, (positive predictive value = 87% and accuracy = 91%).

Conclusions. LIPCOF, NIBUT, and OSDI are significant discriminators for CLIDE in new CL wearers compared with hyperaemia, tear meniscus height, phenol red thread test, staining, and LWE. The best test combination is NIBUT plus LIPCOF Sum and OSDI (named the Contact-Lens-Predicting-Test).

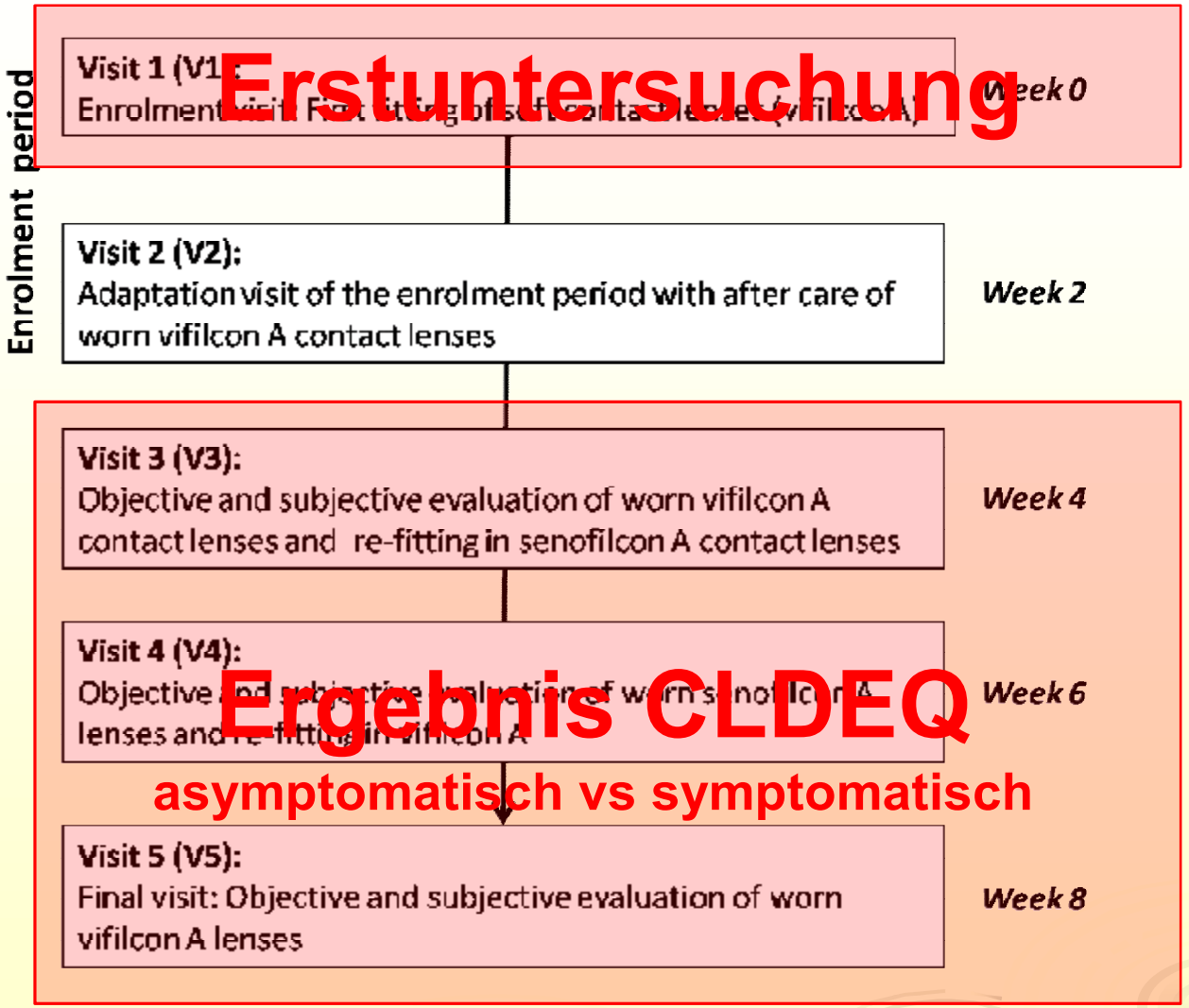
(Optom Vis Sci 2009;86:E1042–E1050)

Key Words: contact lens, dry eye, symptoms, lid parallel conjunctival folds, lid wiper epitheliopathy, tear film, questionnaire

Optometry and Vision Sciences (*September 2009)*

Tests

trocken
ja/nein



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Enrolment period

Visit 1 (V1):
Enrolment visit: First fitting of soft contact lenses (vifilcon A)

Week 0

Erstuntersuchung

Visit 2 (V2):
Adaptation visit of the enrolment period with after care of worn vifilcon A contact lenses

Week 2

Visit 3 (V3):
Objective and subjective evaluation of worn vifilcon A contact lenses and re-fitting in senofilcon A contact lenses

Week 4

Visit 4 (V4):
Objective and subjective evaluation of worn senofilcon A lenses and re-fitting in vifilcon A

Week 6

Ergebnis CLDEQ

asymptomatisch vs symptomatisch

Visit 5 (V5):
Final visit: Objective and subjective evaluation of worn vifilcon A lenses

Week 8

Log. Regression Analyse

Objektive Tests

Subjektive Tests

P-Test

Log. Regression Analyses

Formel - Contact-Lens-Predictive-Test (P-Test)

$CLDEQ = K_1 \times \textbf{LIPCOF Sum} - K_2 \times \textbf{NIBUT} + K_3 \times \textbf{OSDI} - K_4$

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Ocular Surface Disease Index© (OSDI©)[2]

Ask your patients the following 12 questions, and circle the number in the box that best represents each answer. Then, fill in boxes A, B, C, D, and E according to the instructions beside each.

Have you experienced any of the following *during the last week?*	All of the time	Most of the time	Half of the time	Some of the time	None of the time
1. Eyes that are sensitive to light? . .	4	3	2	1	0
2. Eyes that feel gritty?	4	3	2	1	0
3. Painful or sore eyes?	4	3	2	1	0
4. Blurred vision?	4	3	2	1	0
5. Poor vision?	4	3	2	1	0

Subtotal score for answers 1 to 5 (A)

Have problems with your eyes limited you in performing any of the following *during the last week?*	All of the time	Most of the time	Half of the time	Some of the time	None of the time	N/A
6. Reading?	4	3	2	1	0	N/A
7. Driving at night?	4	3	2	1	0	N/A
8. Working with a computer or bank machine (ATM)?	4	3	2	1	0	N/A
9. Watching TV?	4	3	2	1	0	N/A

Subtotal score for answers 6 to 9 (B)

Have your eyes felt uncomfortable in any of the following situations *during the last week?*	All of the time	Most of the time	Half of the time	Some of the time	None of the time	N/A
10. Windy conditions?	4	3	2	1	0	N/A
11. Places or areas with low humidity (very dry)?	4	3	2	1	0	N/A
12. Areas that are air conditioned? . . .	4	3	2	1	0	N/A

Subtotal score for answers 10 to 12 (C)

Add subtotals A, B, and C to obtain D (D = sum of scores for all questions answered) (D)

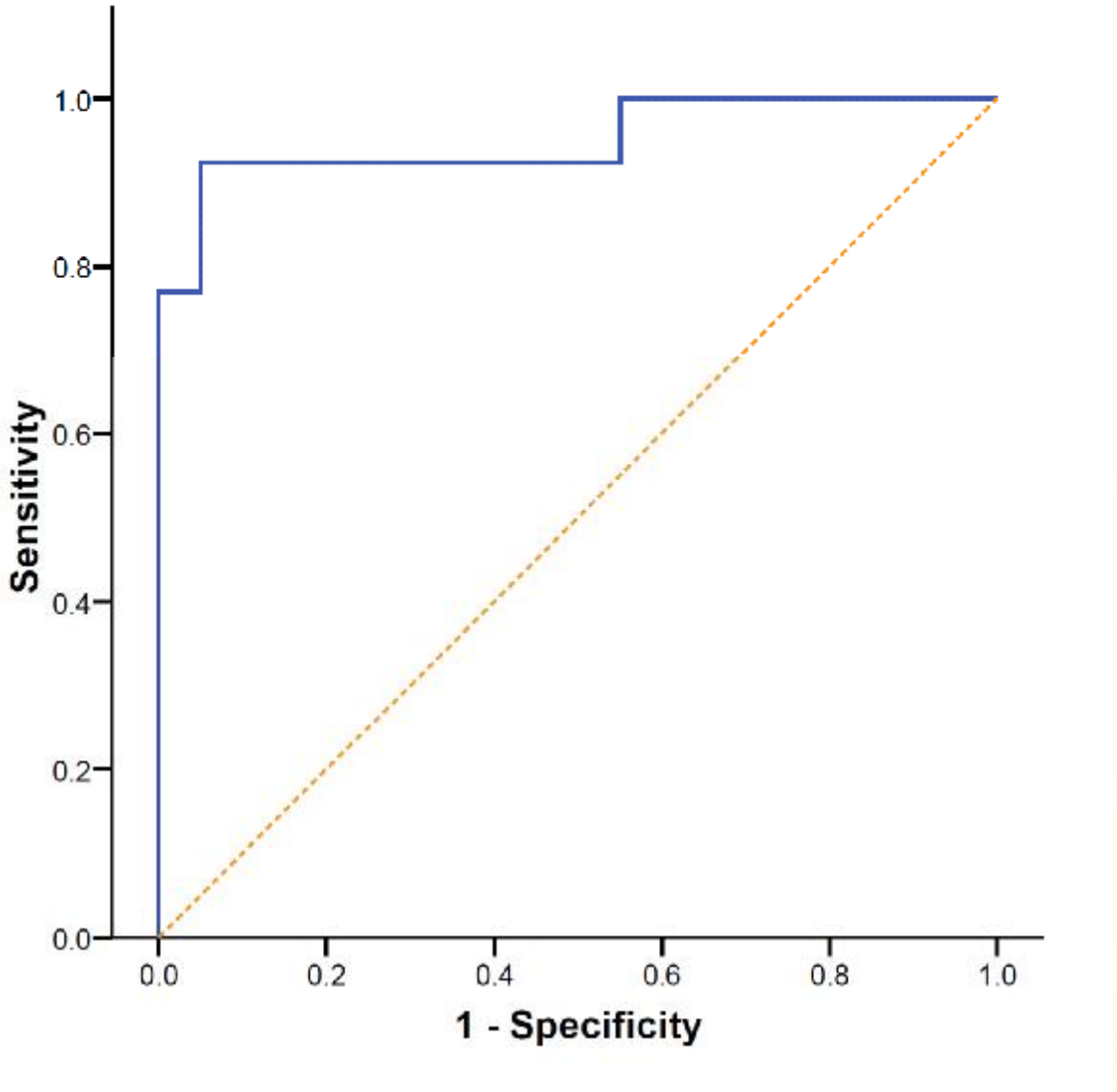
Total number of questions answered (do not include questions answered N/A) (E)

Please turn over the questionnaire to calculate the patient's final OSDI© score.

- LIPCOF Sum
- Nicht invasive Break up Time (NIBUT)
  - (tearscope)
- OSDI

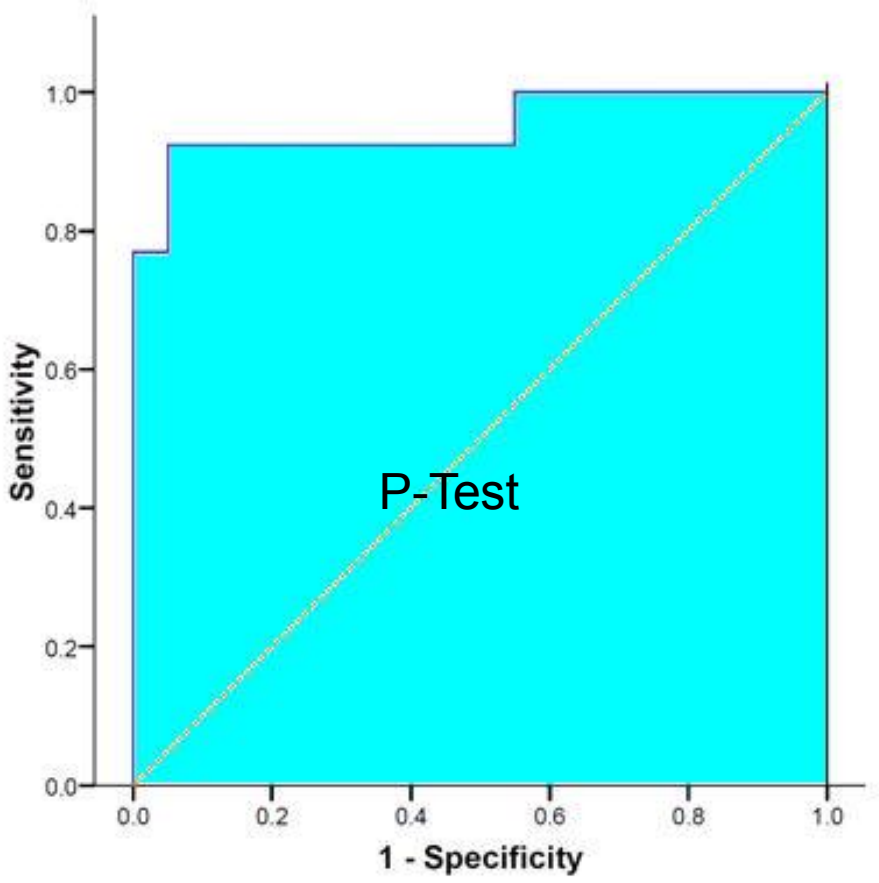
P-Test II

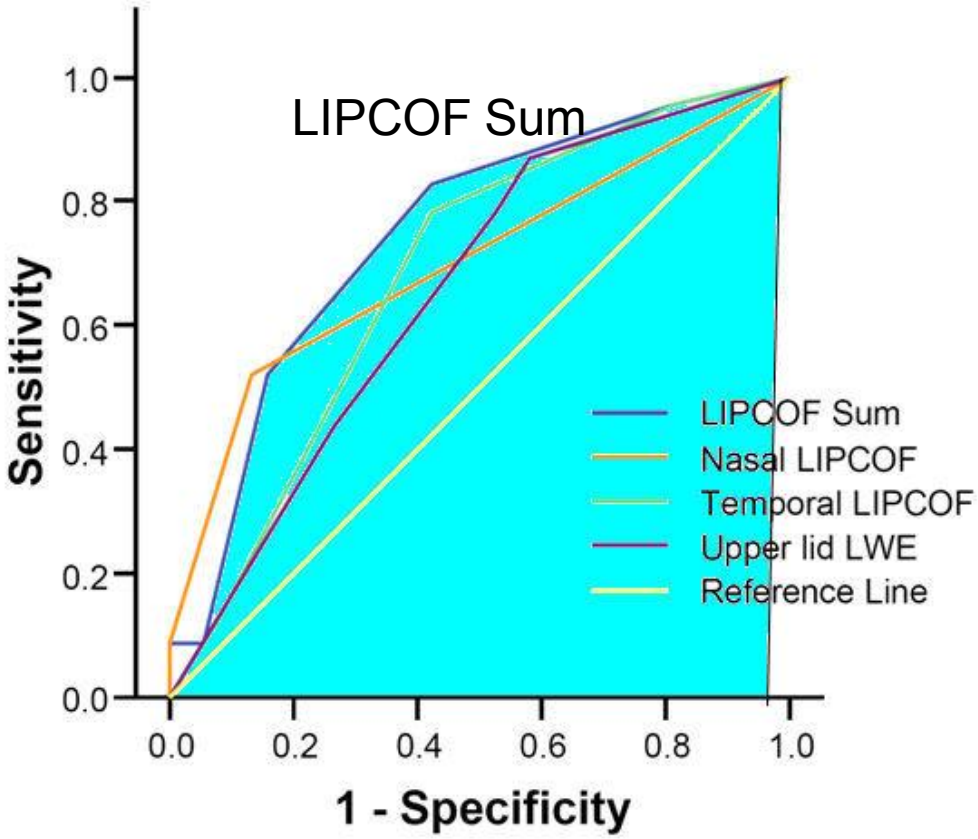
$$CLDEQ = K_1 \times \textbf{LIPCOF Sum} + K_2 \times \textbf{OSDI} - K_3$$



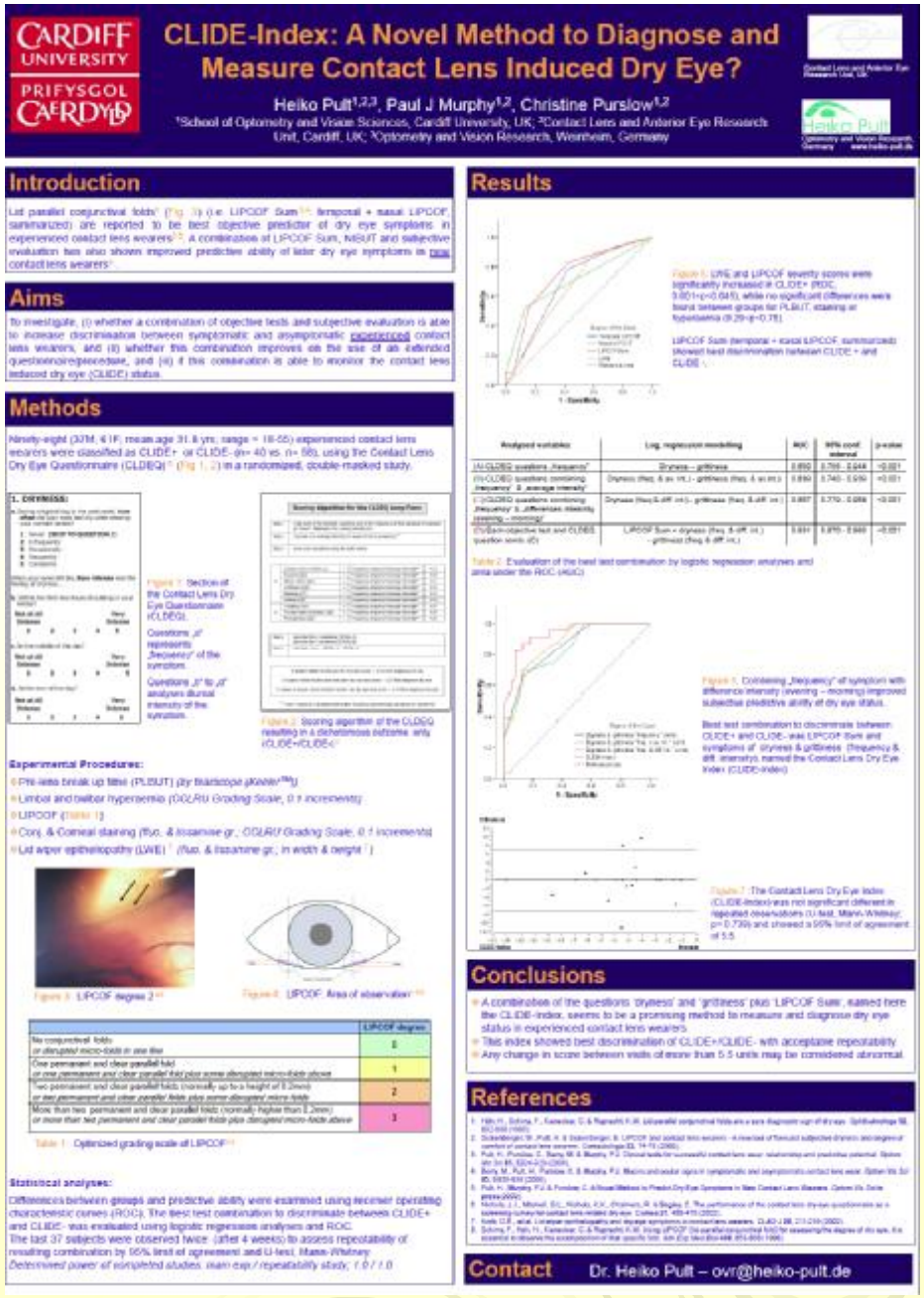
- Diskrimination späterer KL-Symptome, untersucht beim Eingangs-Besuch (Visit 1)

90% Vorhersage-wahrscheinlichkeit





Erfahrene-Linsenträger



CLIDE-Index: A Novel Method to Diagnose and Measure Contact Lens Induced Dry Eye?

Heiko Pult[1,2,3], Paul J Murphy[1,2], Christine Purslow[1,2]
[1]School of Optometry and Vision Sciences, Cardiff University, UK; [2]Contact Lens and Anterior Eye Research Unit, Cardiff, UK; [3]Optometry and Vision Research, Weiterhem, Germany

Introduction

Last parallel conjunctival folds[1] (Fig. 3) (i.e. LIPCOF Sum[1,2]: temporal + nasal LIPCOF, summarized) are reported to be best objective predictor of dry eye symptoms in experienced contact lens wearers[1,2]. A combination of LIPCOF Sum, NIBUT and subjective evaluation has also shown improved predictive ability of later dry eye symptoms in new contact lens wearers[3].

Aims

To investigate, (i) whether a combination of objective tests and subjective evaluation is able to increase discrimination between symptomatic and asymptomatic experienced contact lens wearers, and (ii) whether this combination improves on the use of an extended questionnaire/experience, and (iii) if this combination is able to monitor the contact lens induced dry eye (CLIDE) status.

Methods

Ninety-eight (37M, 61F; mean age 31.8 yrs; range = 18-55) experienced contact lens wearers were classified as CLIDE+ or CLIDE- (n= 40 vs. n= 58), using the Contact Lens Dry Eye Questionnaire (CLDEQ)[4] (Fig 1., 2.) in a randomized, double-masked study.

Figure 1: Section of the Contact Lens Dry Eye Questionnaire (CLDEQ).
Questions „0" represents „frequency" of the symptom.
Questions „1" to „4" analyses diurnal intensity of the symptom.

Figure 2: Scoring algorithm of the CLDEQ resulting in a dichotomous outcome: who is CLIDE+/CLIDE-[4]

Experimental Procedures:

- Pre-lens break up time (PLBUT) (dry fluorescope slitlamp[5,6])
- Limbal and bulbar hyperaemia (OCLARO Grading Scale, 0.1 increments)
- LIPCOF (Table 1)
- Conj. & Corneal staining (fluo. & lissamine gr.; OCLARO Grading Scale, 0.1 increments)
- Lid wiper epitheliopathy (LWE)[7] (fluo. & lissamine gr.; in width & height[7])

Figure 3: LIPCOF degree 2[1,2]

Figure 4: LIPCOF: Area of observation[1,2]

	LIPCOF degree
No conjunctival folds or disrupted micro-folds in one line	0
One permanent and clear parallel fold or one permanent and clear parallel fold plus some disrupted micro-folds above	1
Two permanent and clear parallel folds (normally up to a height of 0.2mm) or two permanent and clear parallel folds plus some disrupted micro-folds	2
More than two permanent and clear parallel folds (normally higher than 0.2mm) or more than two permanent and clear parallel folds plus disrupted micro-folds above	3

Table 1: Optimized grading scale of LIPCOF[1,2]

Statistical analyses:

Differences between groups and predictive ability were examined using receiver operating characteristic curves (ROC). The best test combination to discriminate between CLIDE+ and CLIDE- was evaluated using logistic regression analyses and ROC.
The last 37 subjects were observed twice (after 4 weeks) to assess repeatability of resulting combination by 95% limit of agreement and U-test, Mann-Whitney.
Determined power of completed studies, mean exp / repeatability study; 1.0 / 1.0

Results

Figure 5: LWE and LIPCOF severity scores were significantly increased in CLIDE+ (ROC: 0.801<p<0.841), while no significant differences were found between groups for PLBUT, staining or hyperaemia (0.29<p<0.78).
LIPCOF Sum (temporal + nasal LIPCOF, summarized) showed best discrimination between CLIDE+ and CLIDE-.

Analysed variables	Log. regression modelling	AUC	95% conf. interval	p-value
(A) CLDEQ questions „frequency"	Dryness + grittiness	0.850	0.795 - 0.944	<0.001
(B) CLDEQ questions combining „frequency" & „average intensity"	Dryness (freq. & av. int.) - grittiness (freq. & av.int.)	0.894	0.740 - 0.930	<0.001
(C) CLDEQ questions combining „frequency" & „differences intensity evening – morning"	Dryness (freq.& diff. int.) - grittiness (freq. & diff. int.)	0.867	0.770 - 0.956	<0.001
(D) Each objective test and CLDEQ question (sum) (E)	LIPCOF Sum + dryness (freq. & diff. int.) - grittiness (freq. & diff. int.)	0.931	0.870 - 0.960	<0.001

Table 2: Evaluation of the best test combination by logistic regression analyses and area under the ROC (AUC)

Figure 6: Combining „frequency" of symptom with difference intensity (evening – morning) improved subjective predictive ability of dry eye status.
Best test combination to discriminate between CLIDE+ and CLIDE- was LIPCOF Sum and symptoms of dryness & grittiness (frequency & diff. intensity), named the Contact Lens Dry Eye Index (CLIDE-index).

Figure 7: The Contact Lens Dry Eye Index (CLIDE-index) was not significant different in repeated observations (U-test, Mann-Whitney; p= 0.739) and showed a 95% limit of agreement of 5.5.

Conclusions

- A combination of the questions 'dryness' and 'grittiness' plus 'LIPCOF Sum', named here the CLIDE-index, seems to be a promising method to measure and diagnose dry eye status in experienced contact lens wearers.
- This index showed best discrimination of CLIDE+/CLIDE- with acceptable repeatability.
- Any change in score between visits of more than 5.5 units may be considered abnormal.

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7. Pult, H., Riede-Pult, B.H. & Murphy, P.J. Non-invasive measurement of the tear film lipid layer. Optom Vis Sci 85, 1159-63 (2008).

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107. DOG Kongress, Leipzig, 2009

Log. Regression Analyse

Objektive Tests

CLIDE-Index

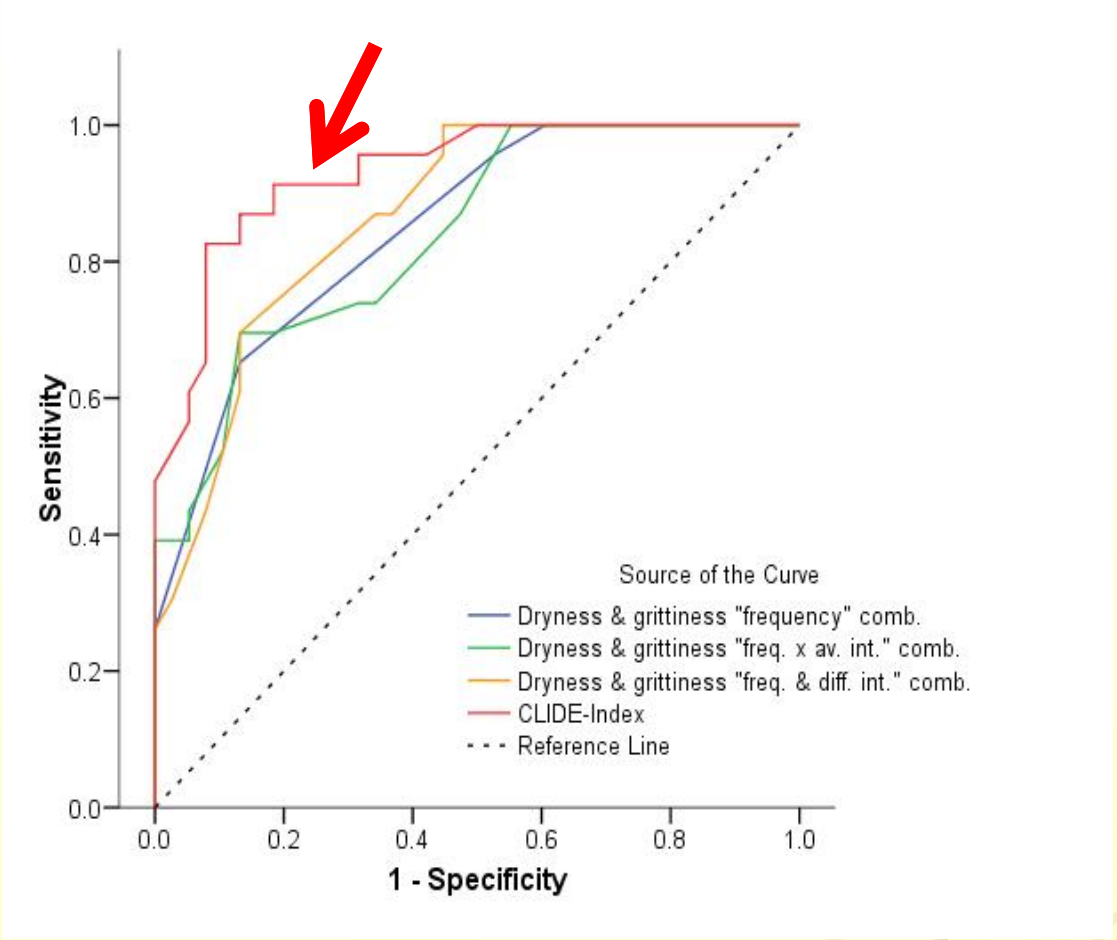
Subjektive Tests

Log. Regression Analyse

- CLIDE Index:
  - Messen und Beobachten von Trockenheits-symptomen bei <u>erfahrenen</u> KL-Trägern

$$CLIDE = K_1 \times \textbf{LIPCOF Sum} + K_2 \times \textbf{Trockenheitsgefühl} - K_3 \times \textbf{Sandkörpergefühl} - K_4$$

Pult et al, 107. DOG Kongress Leipzig, 2009


1.0
0.8
0.6
0.4
0.2
0.0
Sensitivity
0.0
0.2
0.4
0.6
0.8
1.0
1 - Specificity
Source of the Curve
Dryness & grittiness "frequency" comb.
Dryness & grittiness "freq. x av. int." comb.
Dryness & grittiness "freq. & diff. int." comb.
CLIDE-Index
Reference Line

Zusammenfassung

- Klassifikation von Spaltlampenbefunden am besten in **0.1 Abstufungen**
  - Jede Erscheinung hat einen eigenen Werte der Normalität und Auffälligkeit
- **LIPCOF Sum** ist ein Indikator für **Muzindefizit**
  - LIPCOF Sum macht den Kern-Mechanismus des trockene Auges **erstmals** klinisch messbar
- **LIPCOF Sum** ist der am **vorhersagewahrscheinlichste** Einzeltest für trockene Augen

Zusammenfassung

- Neu-Linsenträger
  >> P-Test I
  LIPCOF Sum & NIBUT & OSDI

  >>P-Test II
  LIPCOF Sum & OSDI

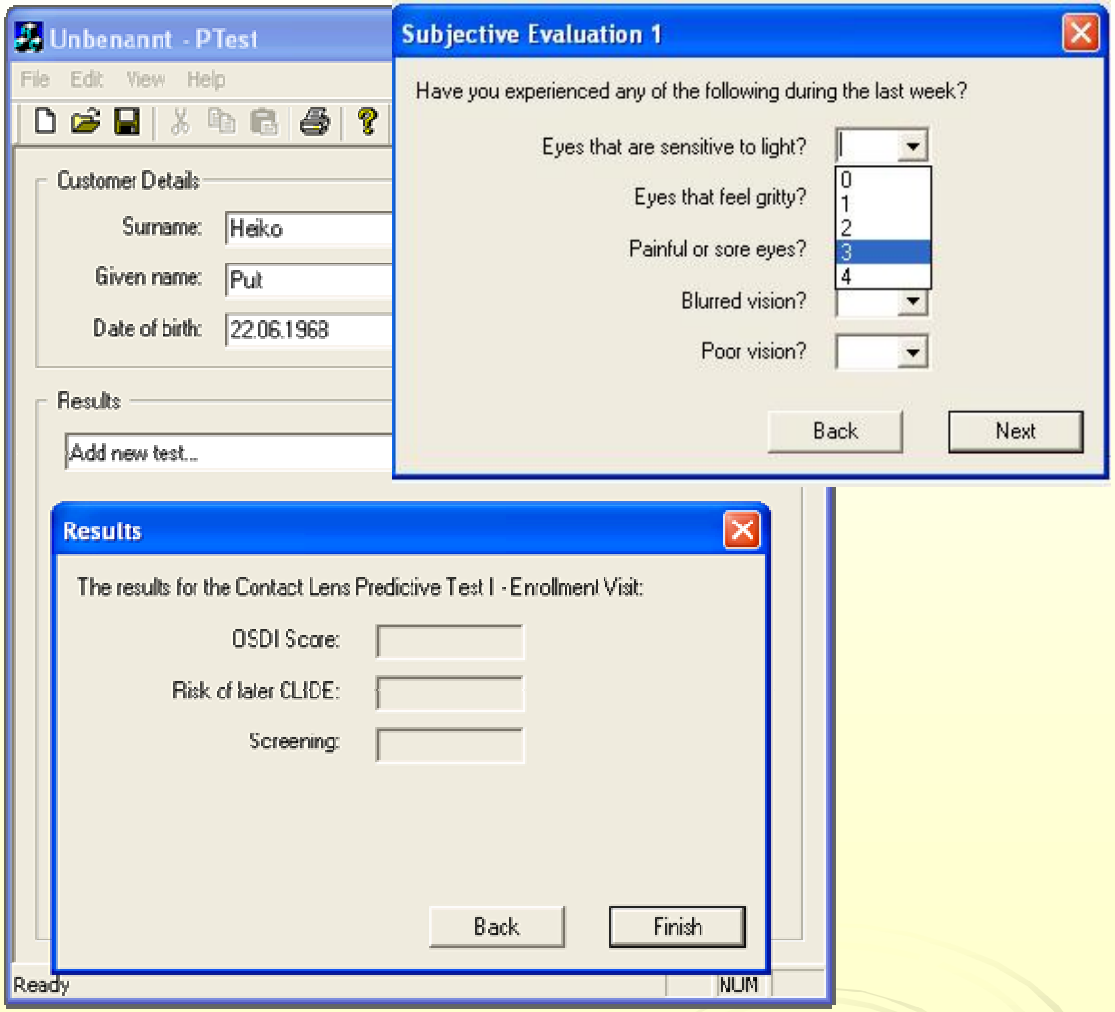
- >> Initial optimierte KL-Versorgung möglich

Zusammenfassung

- Erfahrenen Kontaktlinsenträgern
  >> CLIDE-Index
  LIPCOF Sum & Trockenheit & Sandkörpergefühl

- >>> KL-Träger über Jahre beobachten und frühzeitig umstellen auf optimierte AP bei trockenen Augen

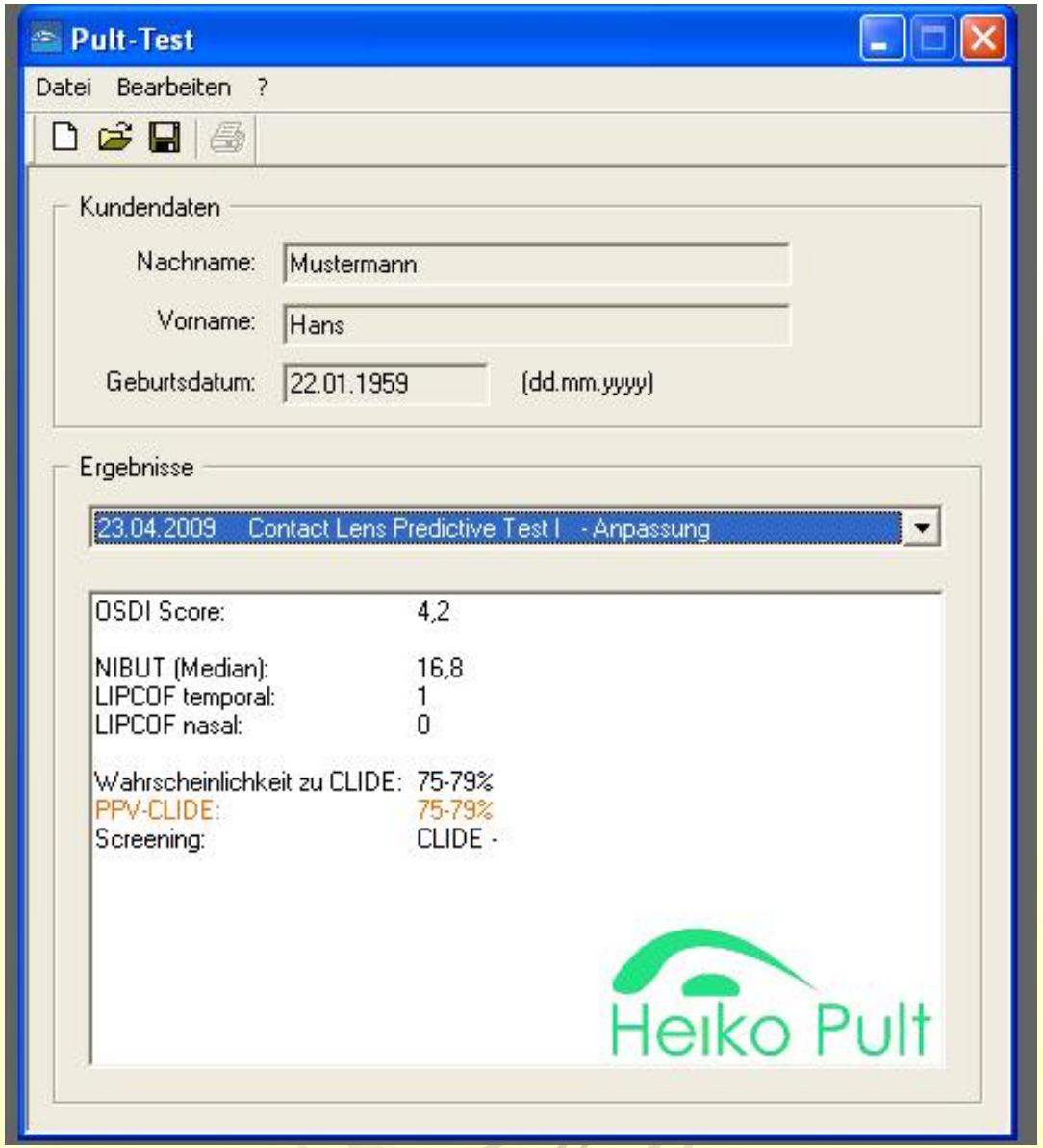
P-Test und CLIDE-Index



www.pult-test.de

- P-TEST:
  - **Vorhersage** , **Screening** und Angabe von **Risiko** von CLIDE bei Neu-KL-Träger zu 90% sicher
- CLIDE-INDEX:
  - **Messen** des CLIDE-Status bei erfahrenen KL-Trägern und **Screening**
  - Beobachten des **Komfort Status**

P-Test

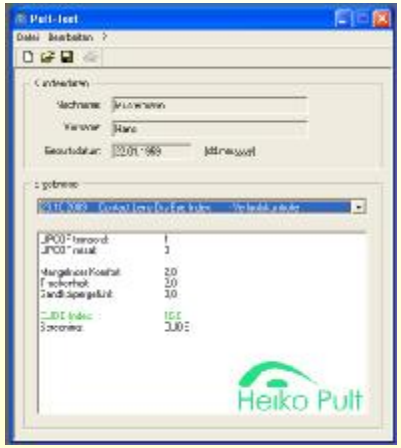

Pult-Test
Datei Bearbeiten ?
Kundendaten
Nachname: Mustermann
Vorname: Hans
Geburtsdatum: 22.01.1959 (dd.mm.yyyy)
Ergebnisse
23.04.2009 Contact Lens Predictive Test I - Anpassung
OSDI Score: 4,2
NIBUT (Median): 16,8
LIPCOF temporal: 1
LIPCOF nasal: 0
Wahrscheinlichkeit zu CLIDE: 75-79%
PPV-CLIDE: 75-79%
Screening: CLIDE -
Heiko Pult

CLIDE - Index

Tendenzen messen & reagieren

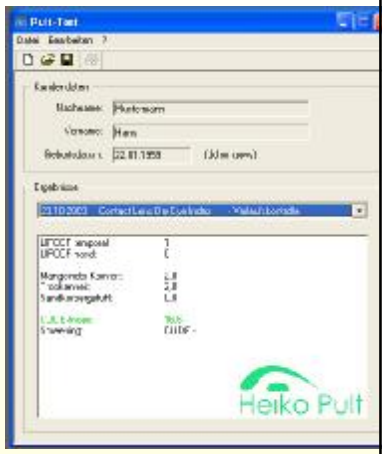
Erst-AP

1. VK



2. VK

3. VK



usw…

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