

University of Messina
Ocular Surface Unit – Italy



Università degli studi di Messina
DIPARTIMENTO DELLE SPECIALITÀ CHIRURGICHE

*CENTRO DI ECCELLENZA REGIONALE PER
LE MALATTIE DELLA SUPERFICIE OCULARE*

Responsabile: Prof. P. Aragona

SOCIETÀ OFTALMOLOGICA SICILIANA

XL CONGRESSO

LENTI A CONTATTO E SUPERFICIE OCULARE

**LA DIAGNOSI DELLA DISFUNZIONE LACRIMALE
NEL PORTATORE DI LENTI A CONTATTO**

Pasquale Aragona

Giardini Naxos (ME), 18 Aprile 2015

Lenti a Contatto e Superficie Oculare

Compiti dell'Oftalmologo:

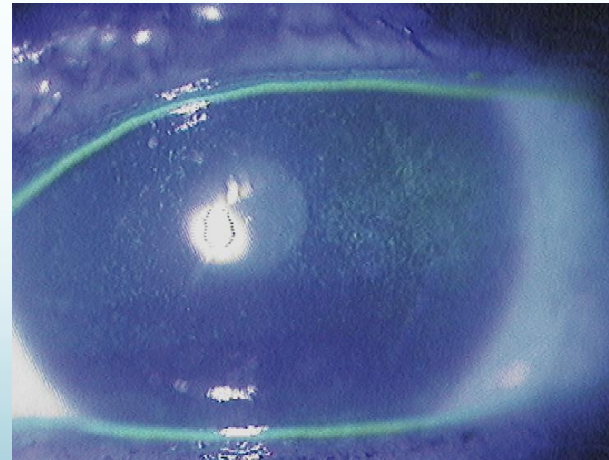
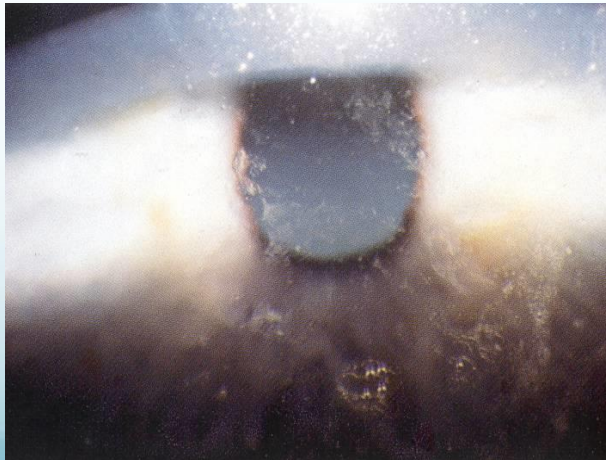
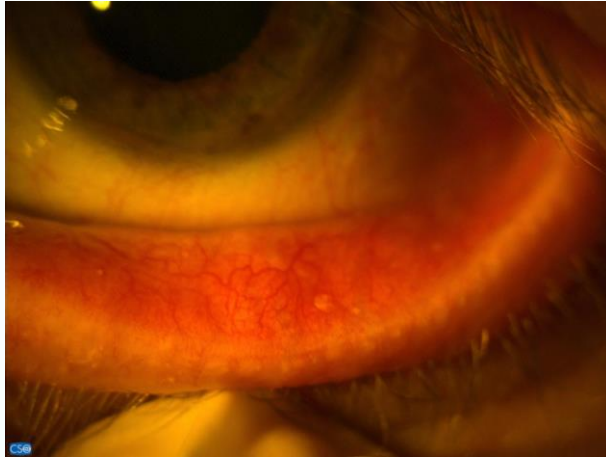
- Valutare la Superficie Oculare prima dell'Applicazione
- Monitorare l'applicazione durante l'uso
- Trattare le complicanze

Prima dell'Applicazione

- Valutare:
 - Congiuntiva e Cornea
 - Regolarità della superficie
 - Blefariti
 - Funzionalità lacrimale



Prima dell'Applicazione



Test Diagnostici per la Superficie Oculare

- Riconoscere le alterazioni delle strutture
- Graduarne la severità
- Fornire una guida per la terapia
- Monitorare i cambiamenti

ANAMNESI

TEST CLINICI

Segni di Disfunzione della Superficie Oculare

Segni Clinici

- Menischi
- Film
- BUT
- EPITELIO
- BORDO PALPEBRALE

Test Funzionali

- OSMOLARITÀ
- TEST QUANTITATIVI
- Schirmer I
- Schirmer I con anestetico
- SENSIBILITÀ CORNEALE
- CLEARANCE LACRIMALE

Test Morfo-Funzionali

- Ferning
- Interferometria Film Lipidico
- MICROSCOPIA CONFOCALE
- CITOLOGIA

TEST SUGGERITI

- PRIMO LIVELLO
 - CUTE DEL VOLTO
 - TBUT
 - COLORAZIONE CORNEALE (Fluoresceina / Verde di Lissamina)
 - MARGINE PALPEBRALE
- SECONDO LIVELLO
 - OSMOLARITÀ LACRIMALE
 - TEST SCHIRMER CON E SENZA ANESTESIA
 - MICROSCOPIA CONFOCALE
- TERZO LIVELLO
 - CITOLOGIA

TEST DI I LIVELLO

- QUESTIONARI (OSDI)
- ESAME CUTE VOLTO
- MENISCO LACRIMALE
- ASPETTO FILM LACRIMALE
- BUT
- COLORAZIONI SUPERFICIE OCULARE
- CLEARANCE DELLA FLUORESCEINA
- ESAME PALPEBRE

TEST DI I LIVELLO

OSDI QUESTIONNAIRE

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	NA
6. Reading?	4	3	2	1	0	NA
7. Driving at night?	4	3	2	1	0	NA
8. Working with a computer or bank machine (ATM)?	4	3	2	1	0	NA
9. Watching TV?	4	3	2	1	0	NA

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	NA
10. Windy conditions?	4	3	2	1	0	NA
11. Places or areas with low humidity (very dry)?	4	3	2	1	0	NA
12. Areas that are air conditioned? ..	4	3	2	1	0	NA

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)

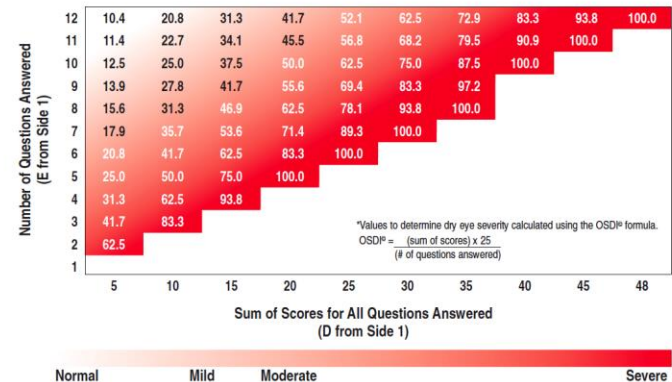
Please turn over the questionnaire to calculate the patient's final OSDI® score.

Evaluating the OSDI® Score¹

The OSDI® is assessed on a scale of 0 to 100, with higher scores representing greater disability. The index demonstrates sensitivity and specificity in distinguishing between normal subjects and patients with dry eye disease. The OSDI® is a valid and reliable instrument for measuring dry eye disease (normal, mild to moderate, and severe) and effect on vision-related function.

Assessing Your Patient's Dry Eye Disease^{1, 2}

Use your answers D and E from side 1 to compare the sum of scores for all questions answered (D) and the number of questions answered (E) with the chart below.* Find where your patient's score would fall. Match the corresponding shade of red to the key below to determine whether your patient's score indicates normal, mild, moderate, or severe dry eye disease.



Patient's Name: _____ Date: _____

How long has the patient experienced dry eye disease? _____

Eye Care Professional's Comments: _____

1. Data on file, Allergan, Inc.
 2. Schiffman RM, Christianson MD, Jacobsen G, Hirsch JD, Reis BL. Reliability and validity of the Ocular Surface Disease Index. *Arch Ophthalmol.* 2000;118:615-621

TEST DI I LIVELLO

Patologie Cutanee

Seborrea



Eczemi



Psoriasi



Rosacea



TEST DI I LIVELLO

LAMPADA A FESSURA

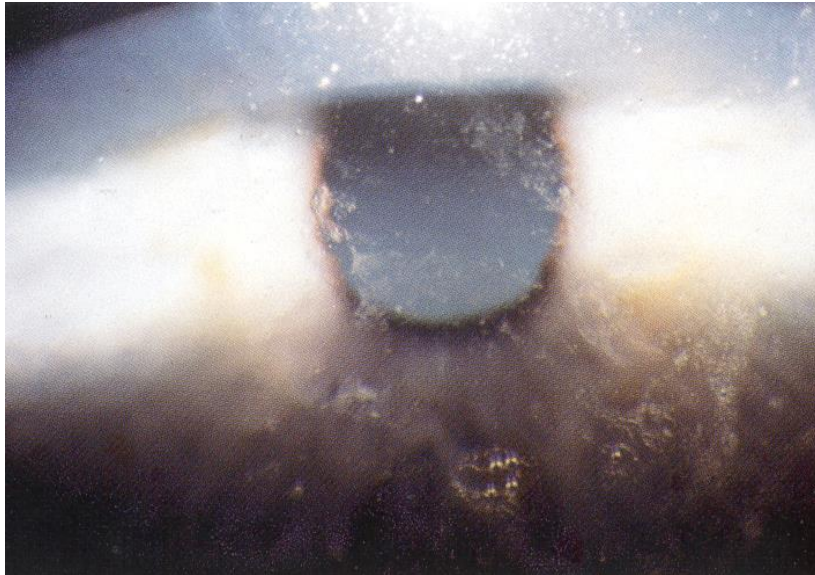
Menischi lacrimali



TEST DI I LIVELLO

LAMPADA A FESSURA

Film Lacrimale



Film sporco per la presenza di muco anomalo

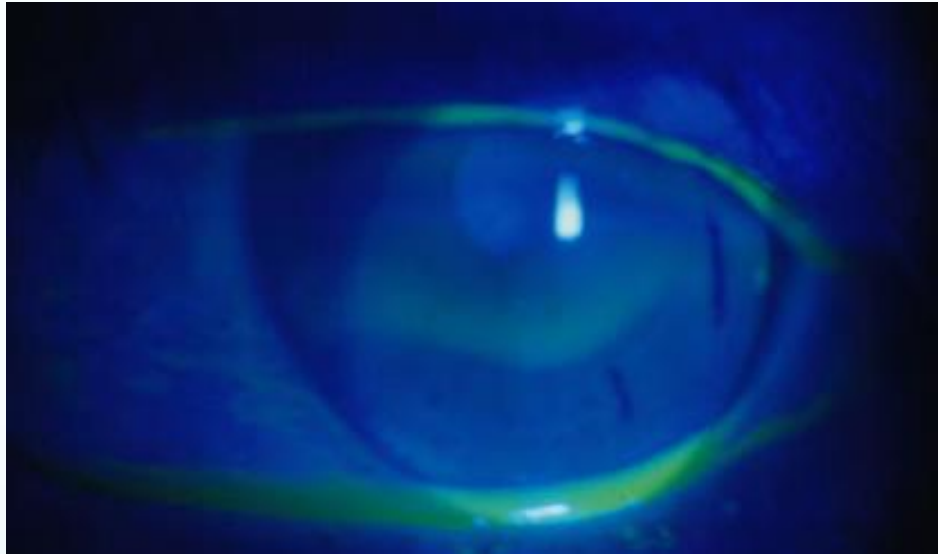


Secrezione schiumosa da alterata secrezione lipidica

TEST DI I LIVELLO

Tear Film Break Up Time (BUT)

Il BUT studia la stabilità del film lacrimale, test che rende un'idea generale della funzionalità lacrimale



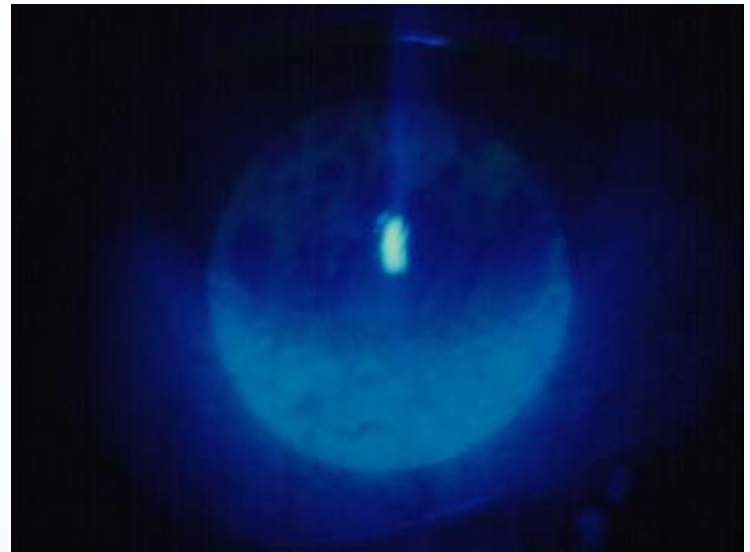
Normale: > 10 sec

Lievi alterazioni: 7-10 sec

Alterato: 5-7 sec

Gravi alterazioni: 3-5 sec

Inefficiente: < 3 sec



CONSEGUENZE DI UN BUT RIDOTTO

Iperosmolarità della zona lacrimale ridotta

Alterazione del glicocalice e delle mucine

Danno all'epitelio esposto

TEST DI I LIVELLO

Colorazioni Epiteliali

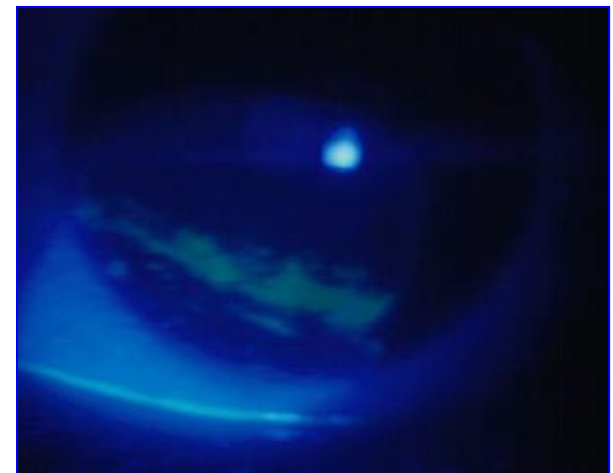
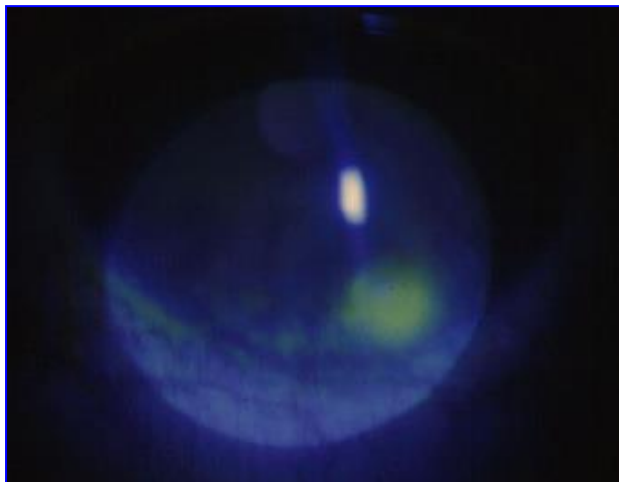
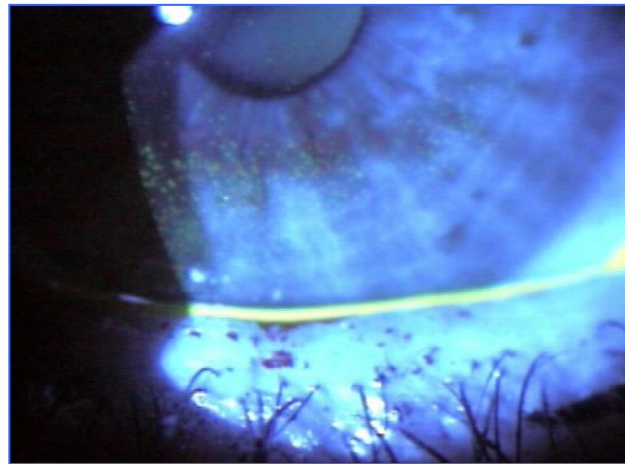
- **Fluoresceina**: Colora aree di degenerazione cellulare o cellule morte, penetrando all'interno delle cellule o negli spazi intercellulari. È anche utile per valutare la permeabilità attraverso le cellule epiteliali.
- **Verde di Lissamina**: colora le membrane cellulari danneggiate o le cellule devitalizzate.
- **Rosa Bengala**: Penetra in aree dove c'è un film lacrimale danneggiato colorando le aree prive del ricoprimento di mucine.

UNA COLORAZIONE COMBINATA CON FLUORESCEINA E VERDE DI LISSAMINA È STATA INDICATA COME LA PIÙ UTILE¹

TEST DI I LIVELLO

LAMPADA A FESSURA

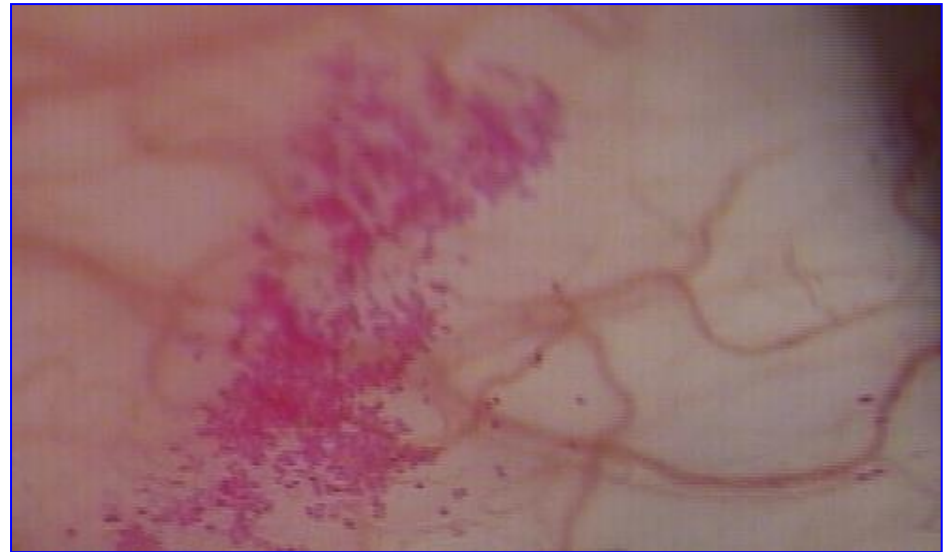
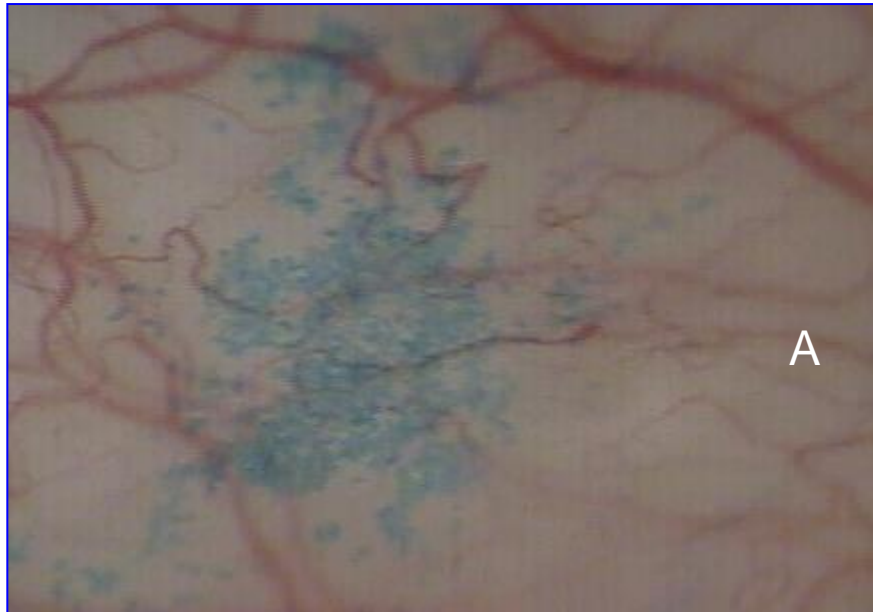
FLUORESCENZA



Colorazione Congiuntivale

- Il danno congiuntivale precede quello corneale
- Una diffusa sofferenza congiuntivale è segno di dry eye severo
- Metodi di valutazione:
 - Verde di Lissamina
 - Fluoresceina (+/- filtro giallo Wratten 12)
 - Rosa bengala

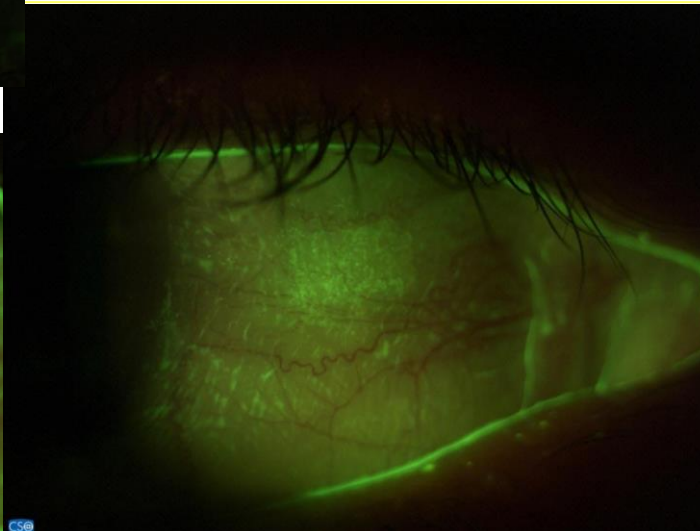
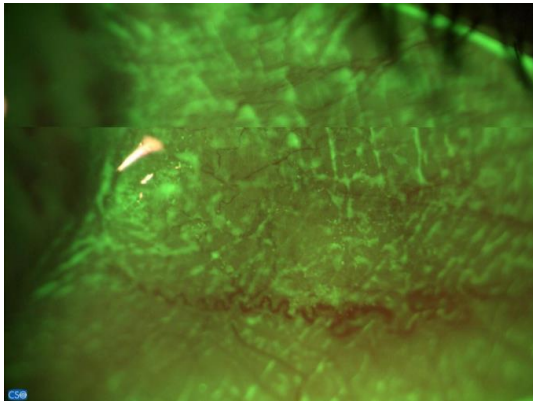
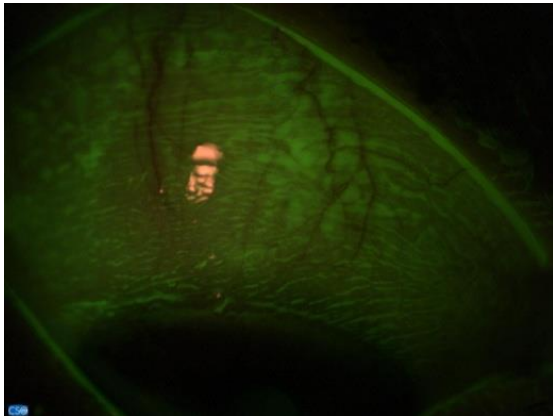
TEST DI I LIVELLO
LAMPADA A FESSURA
VERDE DI LISSAMINA, ROSA BENGALA



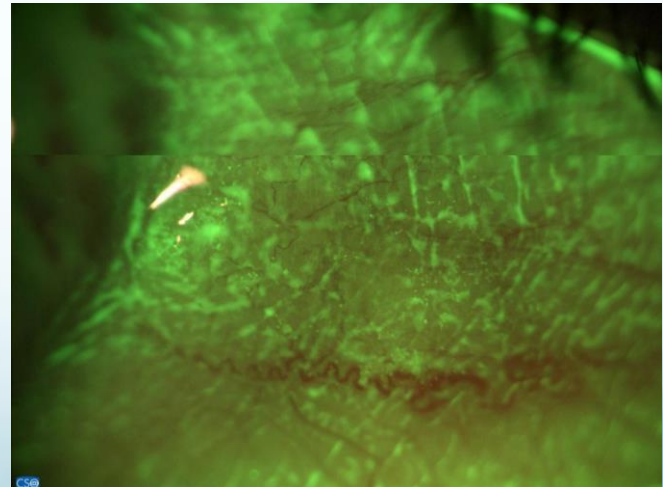
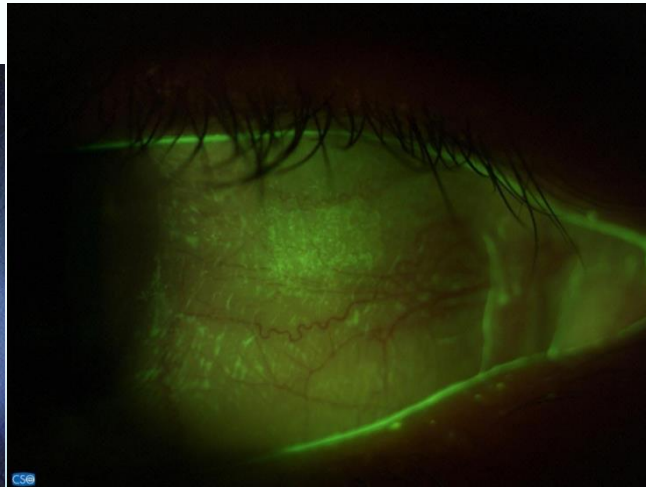
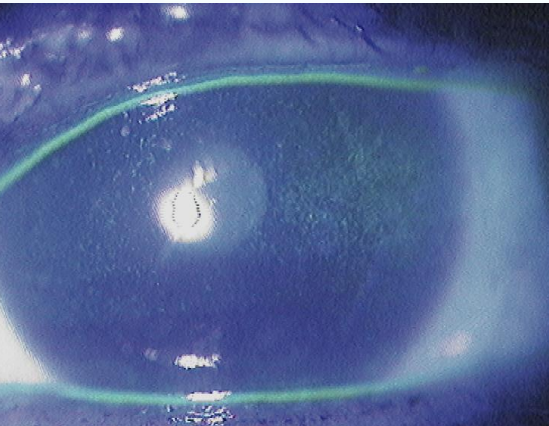
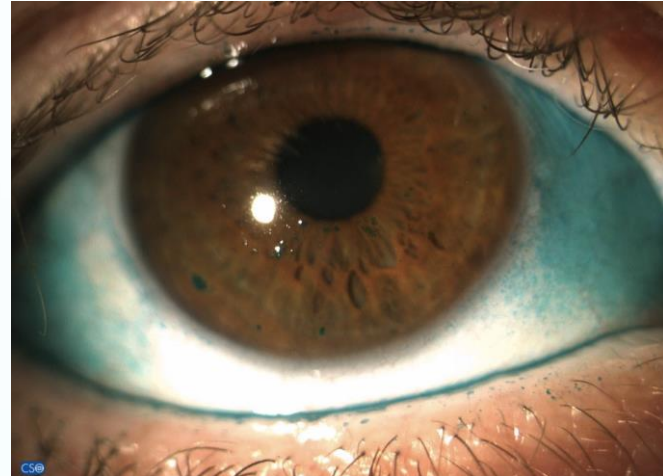
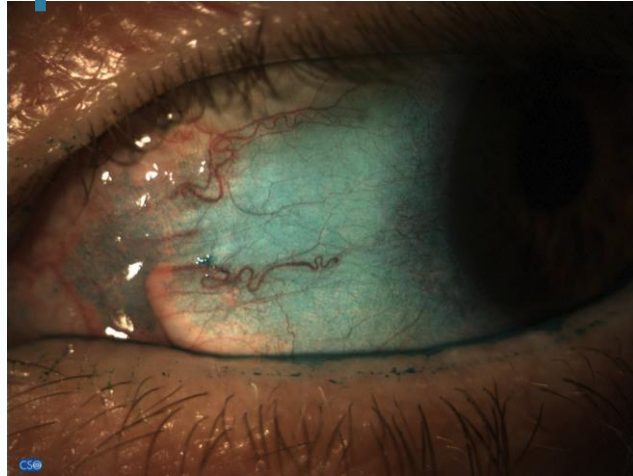
TEST DI I LIVELLO

LAMPADA A FESSURA

E' POSSIBILE RILEVARE E MISURARE LA COLORAZIONE CON FLUORESCEINA DELLA CONGIUNTIVA USANDO UN FILTRO DI BARRIERA GIALLO (WRATTEN # 12).



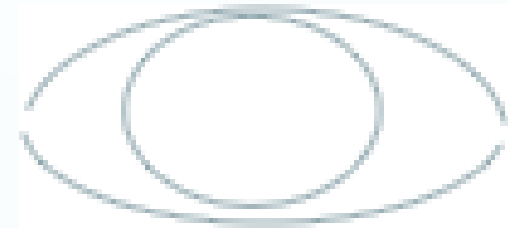
FIRST LINE (Clinical Signs) Epithelial Stains



Grading scale for ocular surface staining

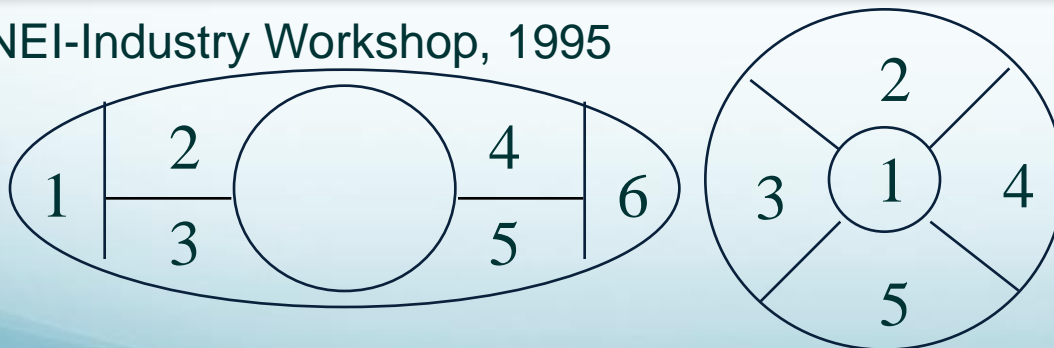
- Several systems of visual grading scale have been suggested
 - van Bijsterveld system,
 - the NEI/Industry Workshop guidelines (Lemp 1995)
- There seems to be no universal consensus among investigators and clinicians as to a single best approach

Van Bijsterveld



Temporal conjunctival staining: 0/3
Corneal staining: 0/3
Nasal conjunctival staining: 0/3






NEI-Industry Workshop, 1995



Grading scale for ocular surface staining

- Several systems of visual grading scale have been suggested
 - van Bijsterveld system,
 - the NEI/Industry Workshop guidelines (Lemp 1995)
 - the Oxford Scheme (Bron 2003)
- There seems to be no universal consensus among investigators and clinicians as to a single best approach

Oxford

PANEL		Grade	Criteria
A		0	Equal to or less than panel A
B		I	Equal to or less than panel B, greater than A
C		II	Equal to or less than panel C, greater than B
D		III	Equal to or less than panel D, greater than C
E		IV	Equal to or less than panel E, greater than D
>E		V	Greater than panel E

FIRST LINE (Clinical Signs) Lid Margin Assessment



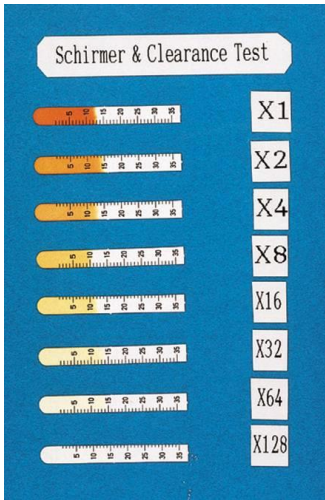
Disease Staging

Grade	Abnormal MG Secretion	Symptoms	Staining	Surface or lid complications
I°	+	-	-	-
II°	+	Mild - moderate	-	-
III-a°	+	Mild - moderate	Mild / Peripheral cornea	-
III-b°	+	Mild - moderate	+Marked / Central cornea	-
IV°	+	Moderate - severe	+	+

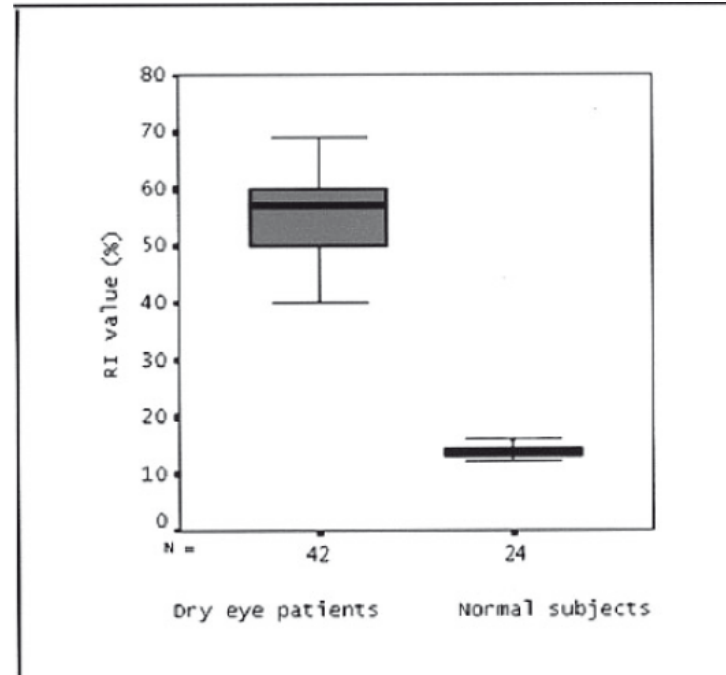
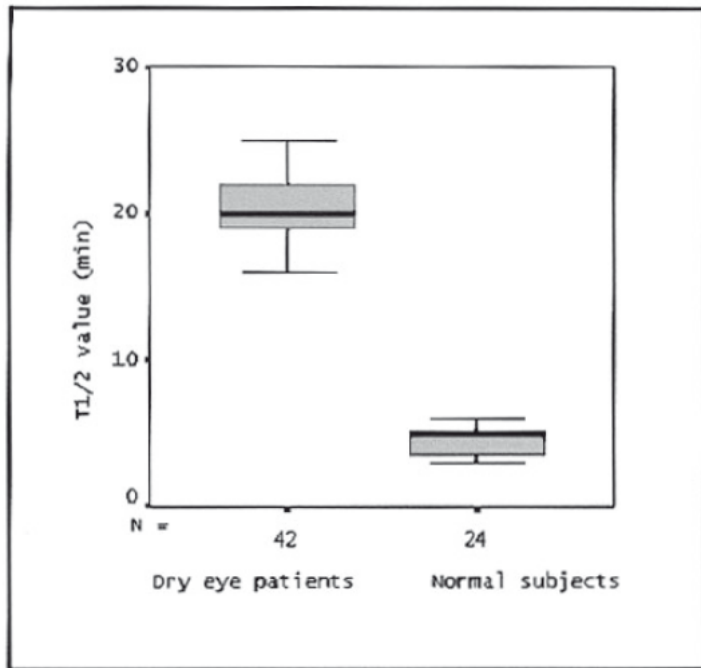
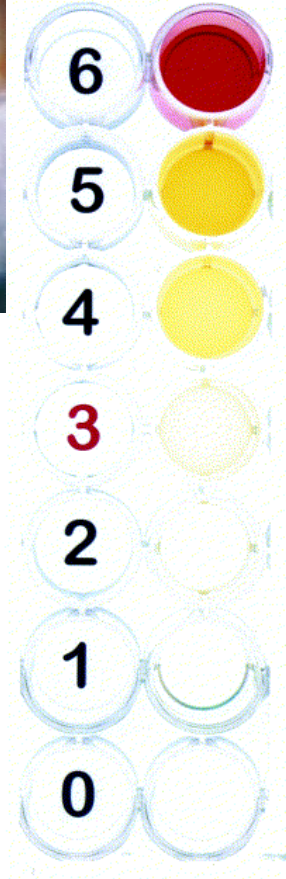
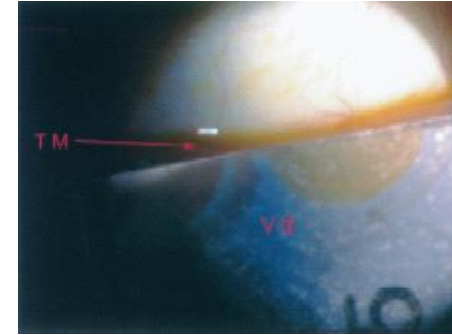
„Plus-Disease“: Signs of microbial involvement

Functional Tests

Tear Clearance



Normal: Fluo disappearance after 15-20 min.



Prabhasawat P, Tseng S. *Br J Ophthalmol* 1998
 Macrì A, Rolando M, Pflugfelder S. *Ophthalmology* 2000
 Gencoglu EA et al. *Ann Nucl Med* 2005

TEST DI II LIVELLO

- TEST QUANTITATIVI DI SECREZIONE LACRIMALE
- SENSIBILITA' CORNEALE
- OSMOLARITA' LACRIMALE

SECONDO LIVELLO (Tests Funzionali)

Test per la produzione della componente acquosa

Def: Il test di Schirmer misura la produzione acquosa attraverso l'imbibizione di una striscia di carta bibula standardizzata posta sul bordo palpebrale tra terzo medio e terzo esterno aggettante nel lago lacrimale e tenuta in sede nell'unità di tempo prescelta.

DEWS *Ocul Surf* 2007

● Quantitative test to determine the tear film

● TEST DI SCHIRMER I:

- Senza anestesia topica
- 5 min, Lacrimazione Riflessa

Secrezione Totale

● TEST DI JONES (modificato):

- Con anestesia topica!
- 5 min, Lacrimazione non stimolata da terminazioni della superficie oculare

Secretion non Stimolata

● La differenza tra test di Schirmer I e di Jones

Secrezione Riflessa

SECONDO LIVELLO (Tests Funzionali)

Test di Produzione Acquosa

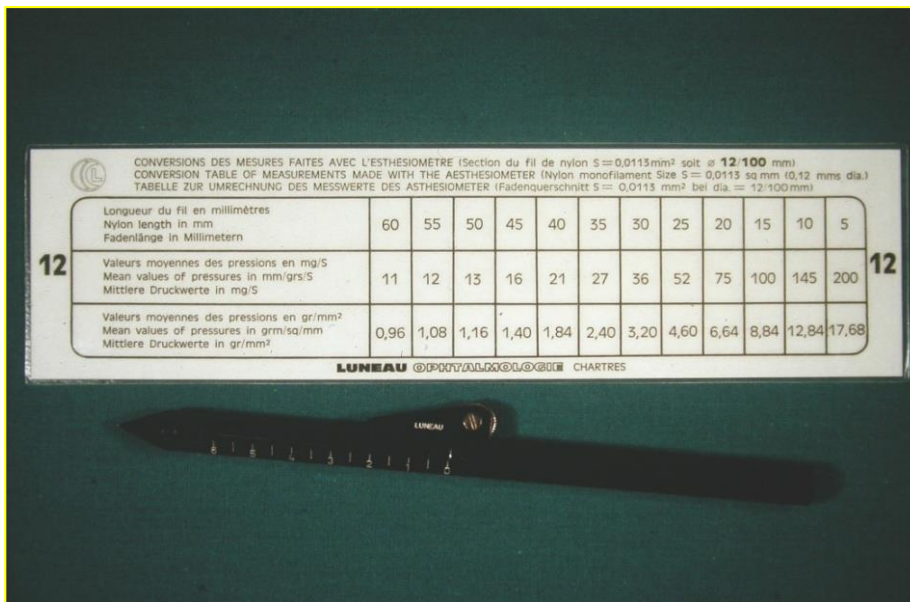
Confronto tra la sensibilità e specificità del test di Schirmer prima e dopo anestesia in pazienti con sindrome di Sjogren (cutoff = 5 mm/5')

- Test di Schirmer I :
 SENSIBILITÀ= 32,6%
 SPECIFICITÀ = 95,5%
- Test di Schirmer dopo anestesia:
 SENSIBILITÀ= 71,9%
 SPECIFICITÀ = 85,3%

SECONDO LIVELLO (Tests Funzionali)

SENSIBILITÀ CORNEALE

- Cochet-Bonnet: sensibilità meccanica
- Belmonte: sensibilità meccanica, chimica e termica



SECONDO LIVELLO (Tests Funzionali)

Osmolarità Lacrimale

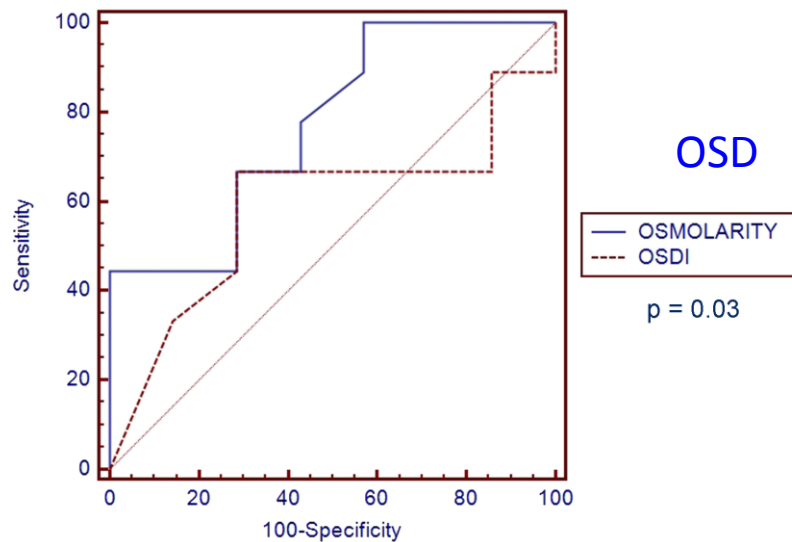
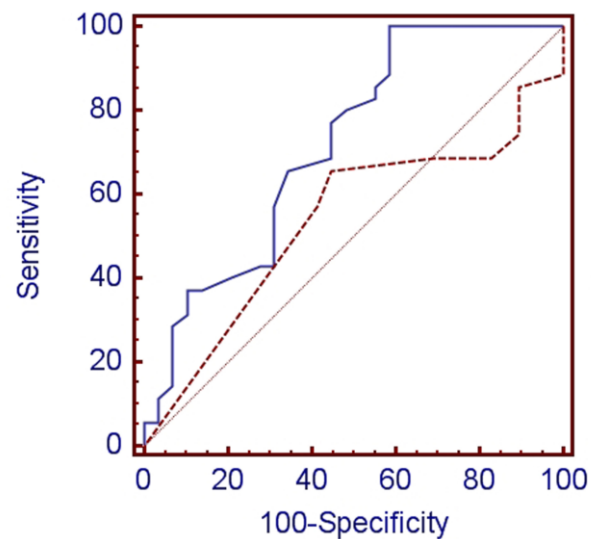
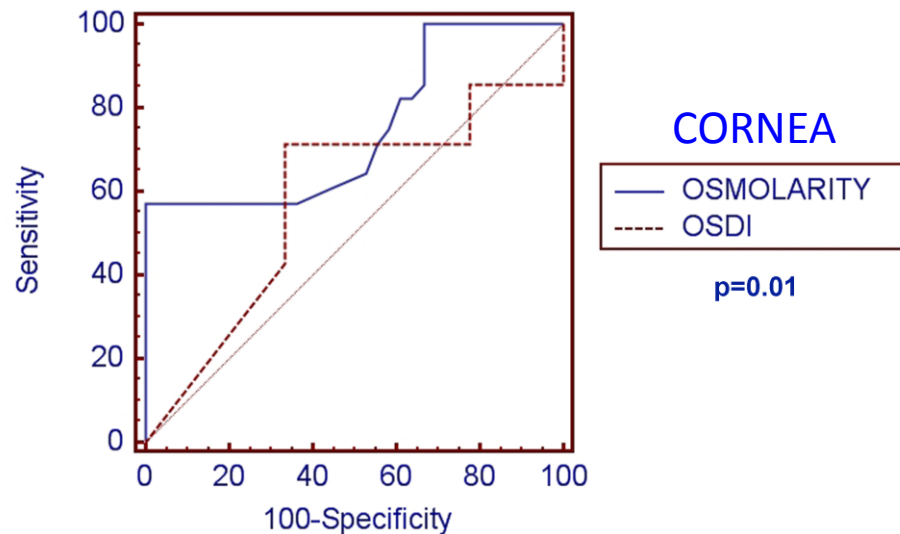
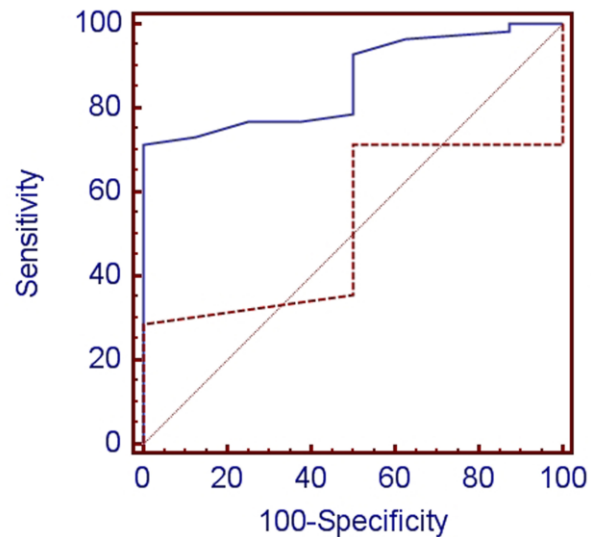


Valore di Cutoff : >308 mOsm/L (soglia più sensibile tra occhi normali e con dry eye lieve/moderato. Lemp MA et al. *AJO* 2010)

Variabilità dell'Osmolarità

- Normali
Range stretto (± 5 mOsm/L) tra I due occhi
- Disfunzione Lacrimale Lieve
Differenza rilevante tra I due occhi ($> \pm 10$ mOsm/L) e in risposta a stimoli ambientali
- Dry Eye
Valori costantemente alti

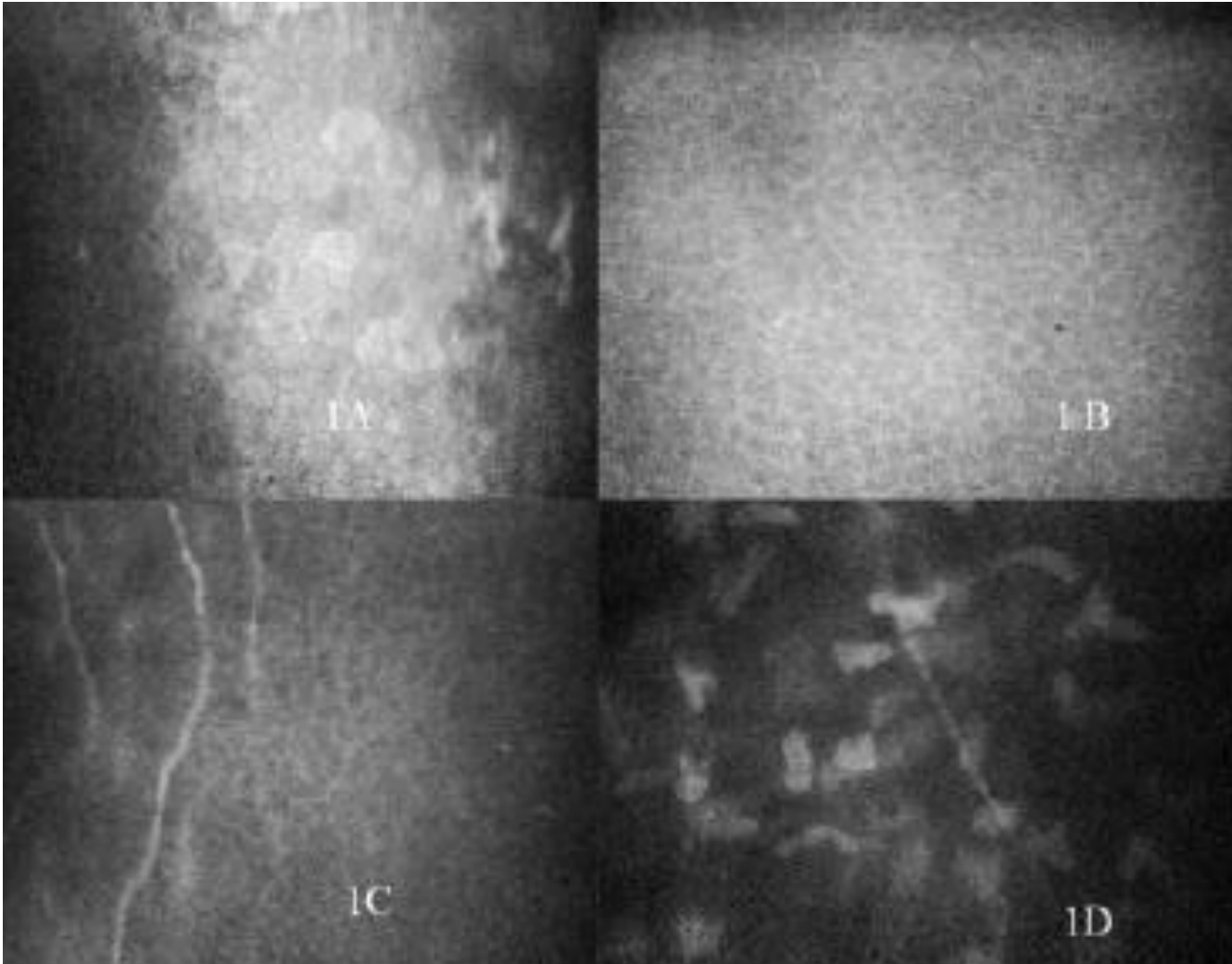
TEAR OSMOLARITY VS OSDI FOR SCREENING IN VDT USERS



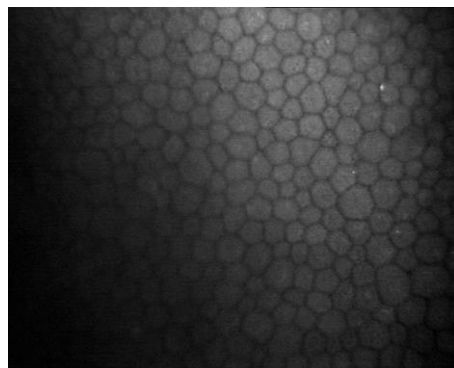
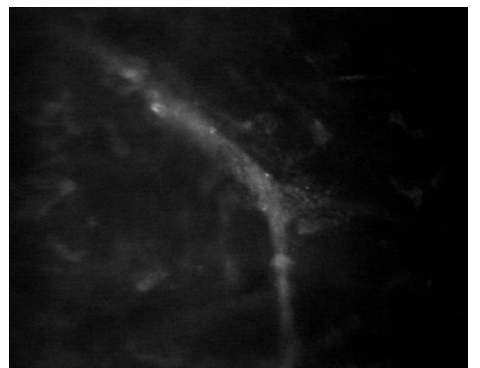
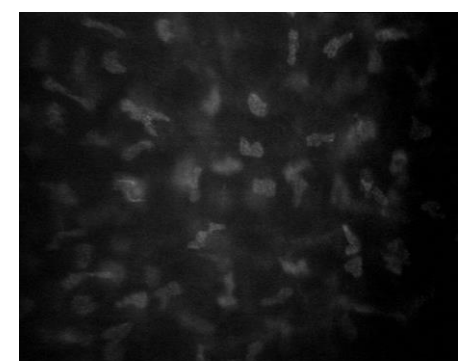
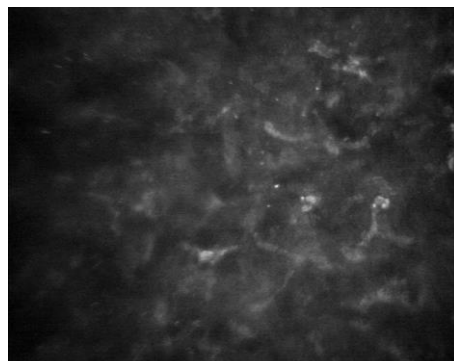
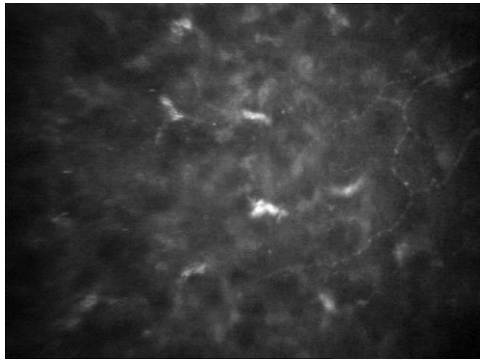
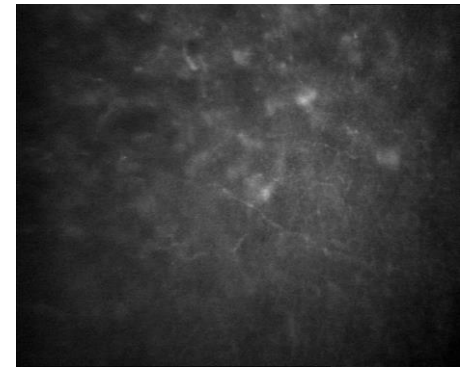
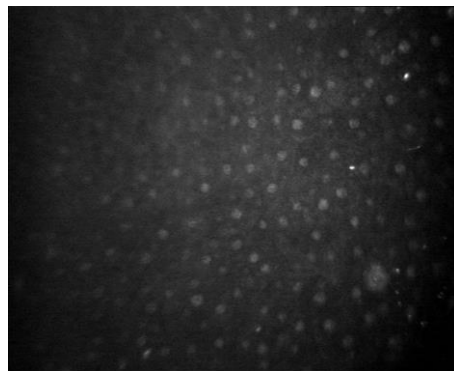
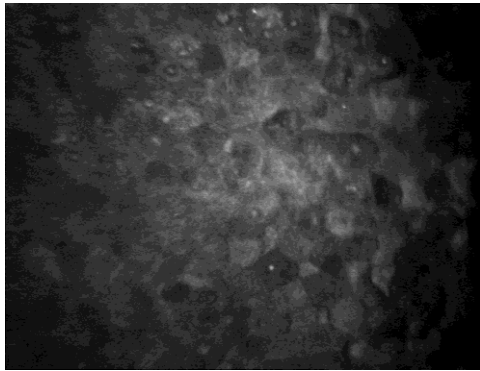
TEST DI III LIVELLO

- MICROSCOPIA CONFOCALE CORNEALE
- CITOLOGIA CONGIUNTIVALE

TEST DI III LIVELLO
INNERVAZIONE
Microscopia Confocale



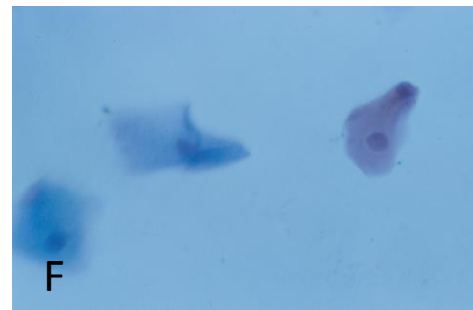
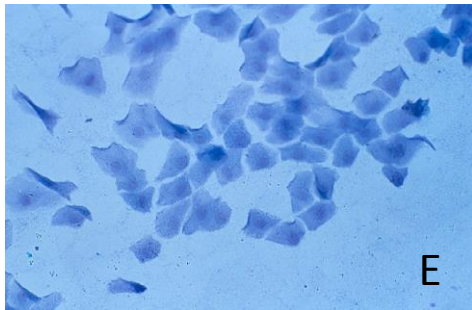
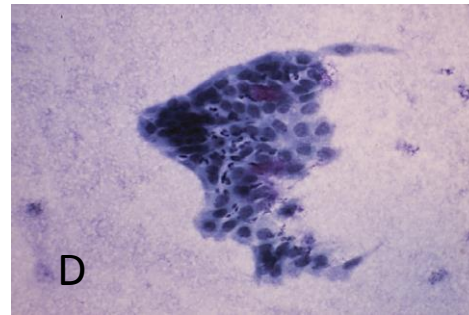
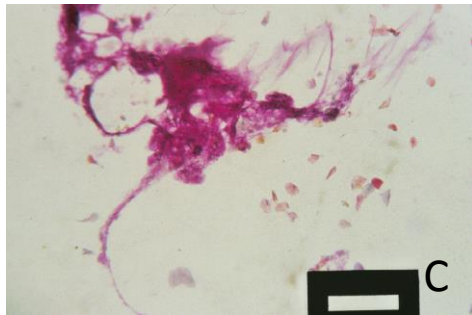
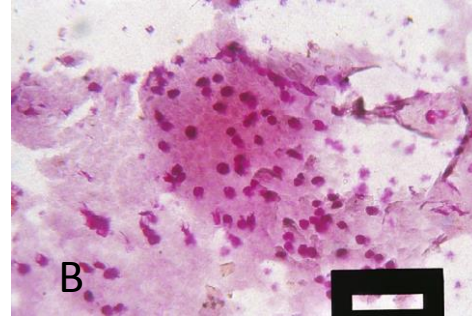
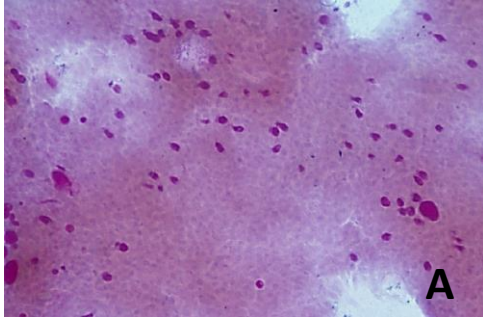
NORMALE



Dry Eye

TEST DI III LIVELLO

CITOLOGIA CONGIUNTIVALE



Aragona P, *Eye*, 1996 – 1998
Aragona P, *Br J Ophthalmol*, 2002

UTILIZZO SICURO DELLE LENTI A CONTATTO

- RICONOSCERE LA CONDIZIONE DELLA SUPERFICIE OCULARE PRIMA DELL'APPLICAZIONE
- SCEGLIERE IL TIPO DILENTE PIÙ ADATTO
- MONITORARE I CAMBIAMENTI DELLA SUPERFICIE OCULARE DURANTE L'USO DELLE LAC
- RICONOSCERE LE ALTERAZIONI DELLA SUPERFICIE OCULARE E INTERVENIRE PER CORREGGERNE LE ALTERAZIONI