DEDICATED DRY EYE PLATFORM

Integrated diagnostic platform easy to use

OS1000

A NEW TOPOGRAPHER GENERATION

Two-in-One true diagnostic workstation for all practitioners

MADE IN ITALY

SBM Sistemi

A NEW TOPOGRAPHER GENERATION

Computerized corneal topography including a module dedicated to the evaluation of the ocular surface.

Computerized corneal topography can be beneficial in the evaluation of certain diseases and injuries of the cornea including:

- Corneal diseases
- Corneal abrasions
- Corneal deformities

Irregular astigmatism following corneal transplants.

Postoperative cataract extraction with acquired astigmatism.

To these features SBM additionally includes:

- Complete dry eye assessment

EXAMS DESCRIPTION

AUTO INTERFEROMETRY

The OS 1000 automatically evaluates the quantity and quality of the lipid component on the tear film.
The device highlights the lipid layer and the software analyses automatically Lipid Layer Thickness (LLT).

TEAR MENISCUS

The thickness of the tear meniscus that is observed on the eyelid margins provides useful information on the tear volume.
The tear meniscus can be examined considering its height, regularity and shape.

NIBUT WITH MAP AND GRAPH

The stability of the mucin layer and the whole tear film is assessed through the study of non-invasive break up time (NIBUT), by using the Placido cone projected onto the cornea.

MEIBOGRAPHY

Meibography is the visualization of the glands through illumination of the eyelid with infrared light. It images the morphology of the glands in order to diagnose any meibomian gland drop out which would lead to tear dysfunction.

3D MEIBOGRAPHY

This new imaging system provides strong evidence to support the choice of a specific therapy (for example IPL treatment) and helps the patient to understand why a certain therapy is being recommended.

BLINK QUALITY

It has been established that efficient blinking plays an important role in ocular surface health during contact lens wear and that it improves contact lens performance and comfort.

BLEPHARITIS

This test helps to visually see blepharitis and presence of Demodex. It can be performed on the outer surface of the eye and eyelids.

OCULAR REDNESS CLASSIFICATION

Once the image of the conjunctiva with its blood vessels is captured, it is possible to compare it with the classification sheets of bulbar and limbal redness degrees.

PUPILLOMETRY

Measurement of the pupil reaction to light with and without glare. Measurement mode: SCOTOPIC, MESOPIC, PHOTOPIC
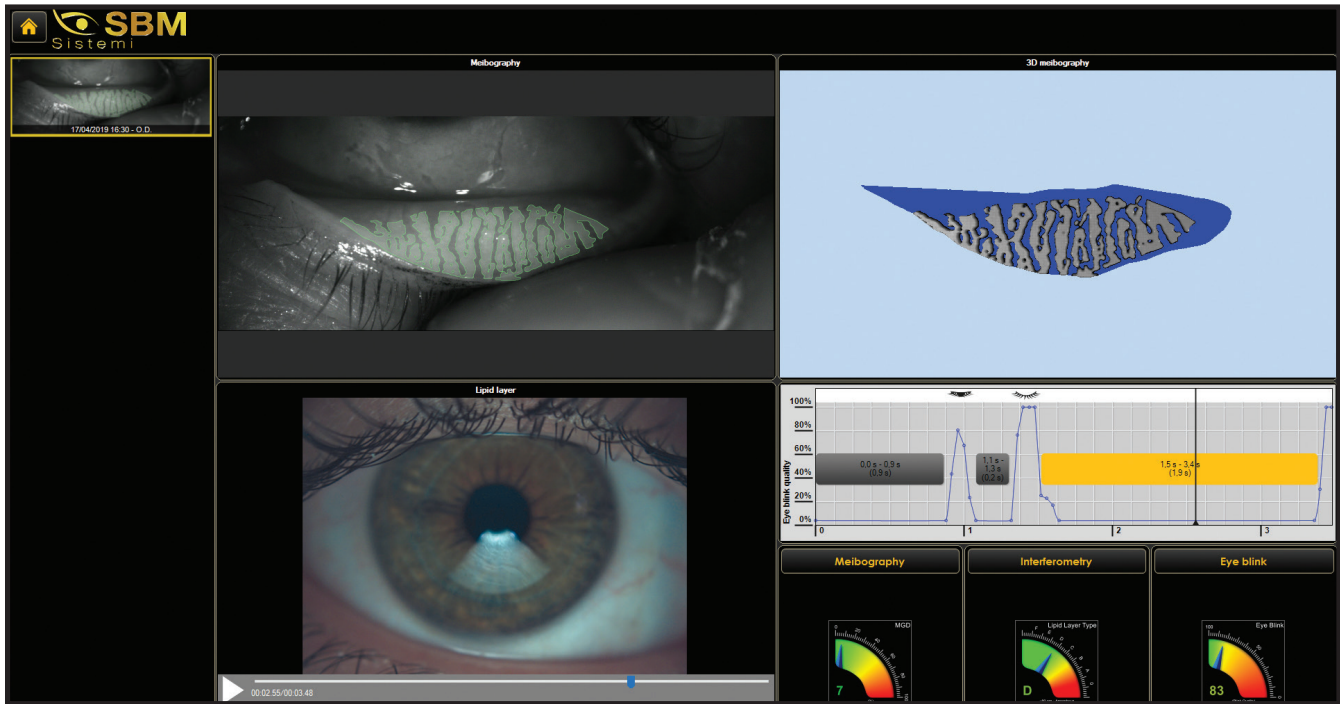
WHITE TO WHITE MEASUREMENT

Evaluation of corneal diameter from limbus to limbus (white-to-white distance, WTW).

ANTERIOR SEGMENT IMAGING

AUTO INTERFEROMETRY

COMPLETE MEIBO ANALYSIS: STRUCTURE AND SECRECTION VIEW

AUTO DETECTION OF:

Maximum thickness of the Lipid layer

Average Thickness

Blinking rate

Using the new Sbm Sistemi OS 1000, Interferometry gets easy, quick and automatic. The software automatically detects the coloured lipids on the patient's eye and determines lipid layer thickness (LLT).

In a few seconds it is possible to get automatically relevant data to understand functionality of Meibomian Glands such as: Avg LLT.

AUTOMATED LIPID LAYER ANALYSIS

The OS 1000 software analyses lipid layer thickness and allows to understand the functionality of Meibomian Glands.

It is possible to carry out a follow up after MG treatment detecting an increase in secretion.
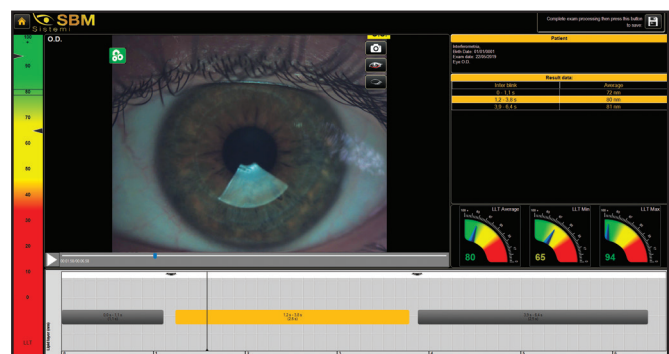
The evaluation of the lipid layer is part of your overall Dry Eye Assessment. Knowing what is causing Dry Eye will help determine the best treatment option.

After your assessment is complete, the Optometrist will discuss your treatment options.

Lipid pattern classification, incidence and clinical interpretation is adapted from Guillon & Guillon description incidence (%) with estimated thickness (nm).

Observation of blinking frequency and completeness should also be considered - while listening to history and symptoms can be an ideal time to observe this.

A typical blink pattern can be observed as approximately one blink every five seconds, ie 11 blinks per minute. Incomplete blink can often be observed in contact lens wearers, and frequent blink may be a result of an attempt to maintain a relatively thin lipid layer.

# TEAR MENISCUS HEIGHT MEASUREMENT
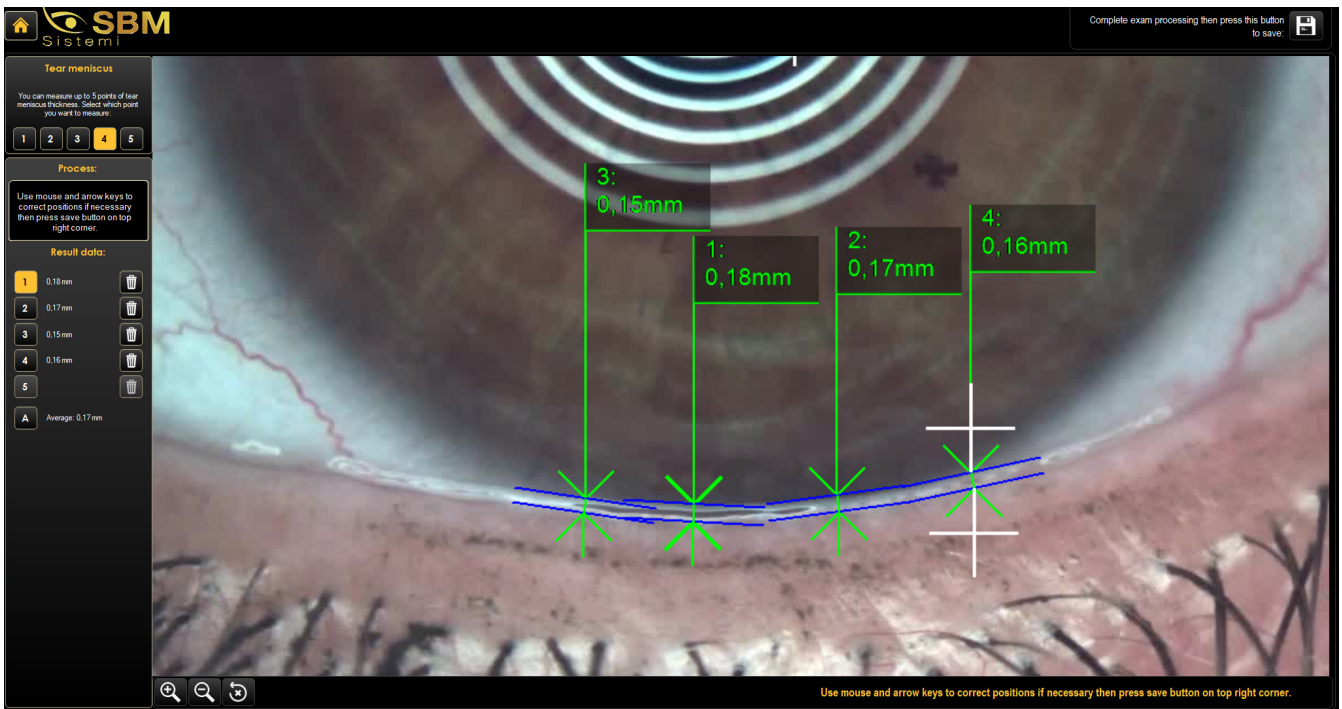
POSSIBILITY TO ACQUIRE UP TO 5 MEASURING POINTS

Low tear production may result in aqueous tear deficiency (ATD) and cause dry eye symptoms. However, measuring the tear volume is difficult since the methods available nowadays are invasive and irritating.

Reflex tear production can be induced, giving an overestimation of basal tear flow and volume. The sizes of the tear meniscus are related to the tear secretion rate and tear stability, and they are good indicators of the overall tear volume. Tear meniscus height is related to the tear secretion rate and tear stability and is so a good indicator of tear production.

The aqueous layer is evaluated through the non-invasive "Tear Meniscus" test and is then classified into different categories.

AUTO-NIBUT
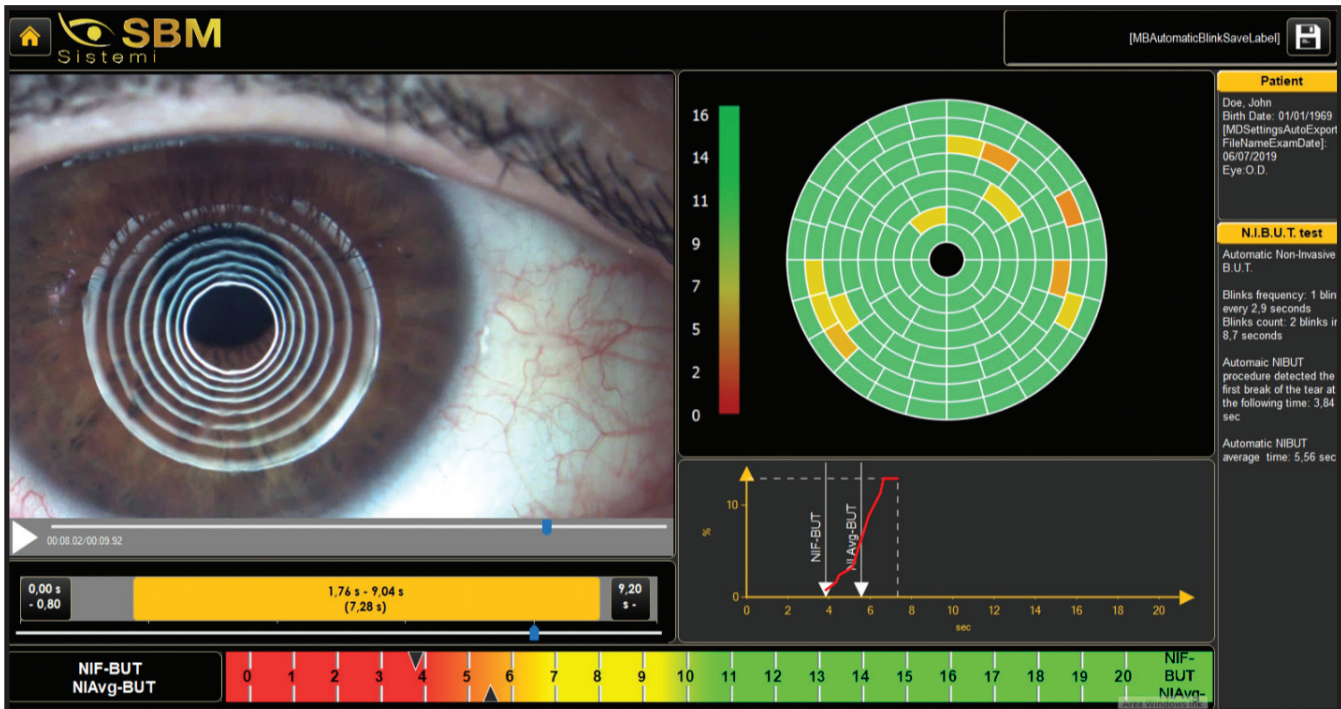
The Sbm Device allows to evaluate tear film stability and regularity, using non-invasive break up time measurement (NIBUT). This measures the number of seconds between one complete blinking and the appearance of the first discontinuity in the tear film.

With the Sbm Device, thanks to one single video, the physician can gain lots of information:

- Automatic NIBUT
- Average of more than one value
- Graph to understand the trend of tear film stability during the video
- Tear topography that shows all breaking the tear film during time.

Through the Placido rings, OS 1000 automatically provides:

- First BUT
- Avg BUT
- Stability graph
- Tear topography
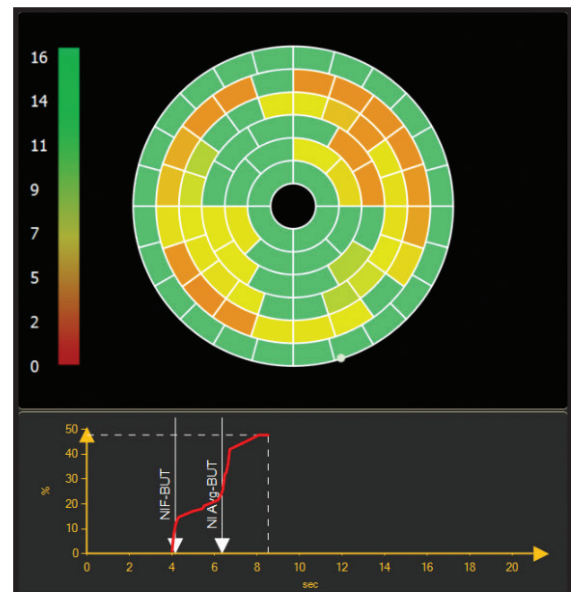
BLINKING QUALITY

A healthy person should be expected to show periodic blinking, by closing the eyelids briefly. Most blinks are spontaneous, occurring regularly with no external stimulus. However, a reflex blink can occur in response to external stimuli such as a bright light, a sudden loud noise, or an object approaching towards the eyes.

A voluntary or forced blink is another type of blinking in which the person deliberately closes the eyes and the lower eyelid raises to meet the upper eyelid.

A complete blink, in which the upper eyelid touches the lower eyelid, contributes to the health of the ocular surface by providing a fresh layer of tears as well as maintaining optical integrity thanks to a smooth tear film over the cornea.

The rate of blinking and its completeness vary depending on the task undertaken during blink assessment, the direction of gaze, the emotional state of the subjects and the method under which the blink is measured.

It is also well known that wearing contact lenses (both rigid and soft lenses) can induce significant changes in blinking rate and completeness.

It is been established that efficient blinking plays an important role in ocular surface health during contact lens wear and that it improves contact lens performance and comfort.

Inefficient blinking during contact lens wear may be related to a low blinking rate or incomplete blinking and can often be a reason for dry eye symptoms or ocular surface staining.

OS 1000 automatically detects and analyses blinking, determining its quality.

MEIBOGRAPHY
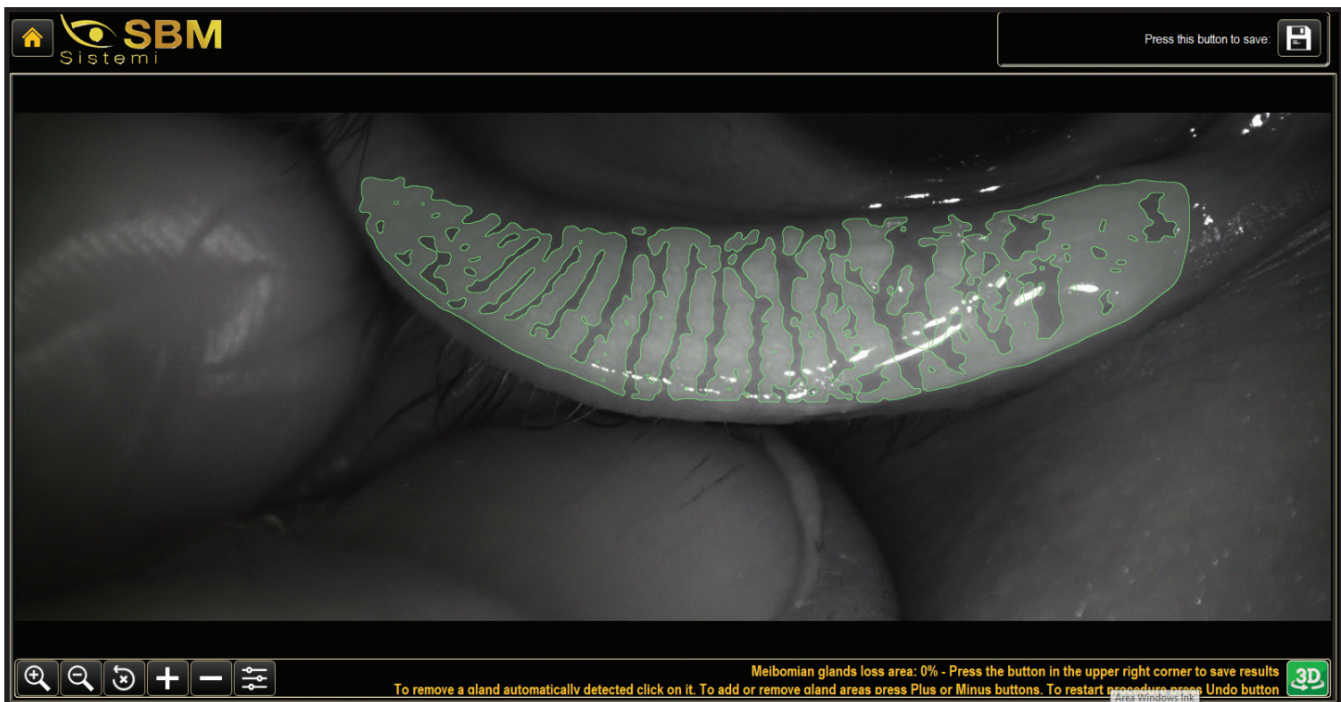
MEIBOMIAN GLAND AUTO DETECTION ON UPPER AND LOWER EYELIDS

Meibomian Glands (MGs) play a significant role in tear quality by producing lipids (meibum) that are part of the superficial tear film. Dysfunction of the MGs destabilizes tear composition resulting in evaporative dry eye.

The posterior lamella of the eyelid hosts a fleet of parallel MGs situated between the palpebral conjunctiva and tarsal plate. A normal Meibomian Gland is approximately linear and 3–4 mm in length, traversing the posterior eyelid perpendicularly to the lid margin.

Closer inspection of a Meibomian Gland demonstrates a tubulo-acinar architecture with saccular arrangements of acini and a ductal system that communicates with orifices near the muco-cutaneous junction of the eyelid.

HOW IT WORKS

The System automatically analyses the images taken through a sensitive infrared camera (NIR) to locate the Meibomian Glands in a guided way:

- An exam valid both for the upper and the lower eyelids;
- Automatic percentage of the extension of MGs in the chosen area
- Automatic percentage of the Meibomian Gland loss area

If the operator prefers, it is also possible to manually compare the images taken with three different related grading scales.

Glandular acini contain clusters of modified sebaceous cells called meibocytes (functional unit of the Meibomian Gland). These cells synthesize and secrete lipids (meibum) into the pre-corneal tear film. Meibum permeates the tear surface where it serves several important functions. It prevents tear evaporation and thus desiccation of the ocular surface; it acts as a physical and hydrophobic barrier to the inward movement of environmental and organic agents; and it lubricates the ocular surface to prevent irritation while promoting a clear ocular image. Consequently, tear physiology is dependent upon the proper functioning of the MGs.

AUTOMATIC LID DETECTION

To decrease evaluation time, the software automatically detects the lid margin for MG analysis.
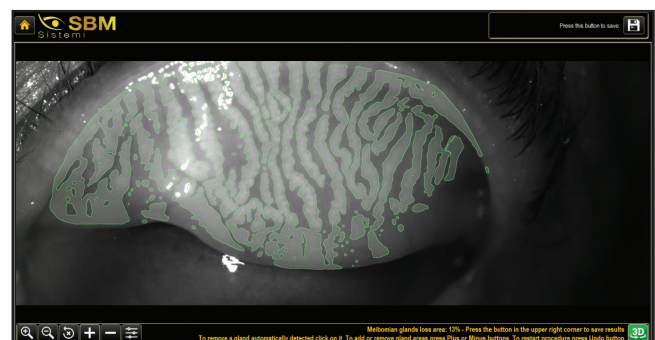
THE SBM DEVICE CAN DETECT THE LENGTH AND WIDTH OF MEIBOMIAN GLANDS SHOWN THROUGH INFRARED MEIBOGRAPHY WITHOUT REQUIRING ANY INPUT FROM THE USER. THE IMAGES ARE THEN AUTOMATICALLY CLASSIFIED.

MEIBOGRAPHY 3D

AN OUTSTANDING DIAGNOSTIC EVALUATION IS NEEDED TO DEMONSTRATE THE EFFECTIVENESS OF THE IPL TREATMENT TO PATIENTS
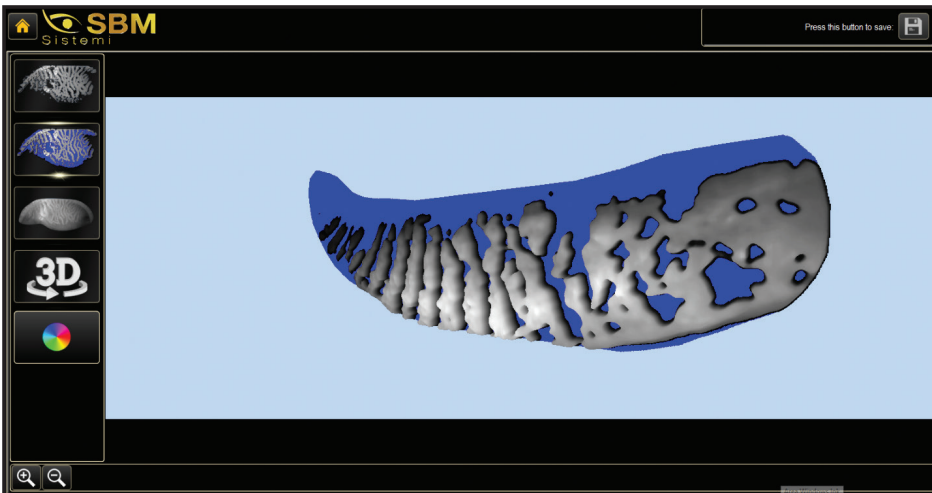

BENEFITS FOR PATIENTS:

- For the first time, a 3D image can help to understand the structure of the eyelids. It can show possible diseases of Meibomian Glands and differences with healthy MGs.

- Patients can see for themselves why they are getting eye discomfort and fluctuating vision

- Patients can understand why a specific treatment is suggested.
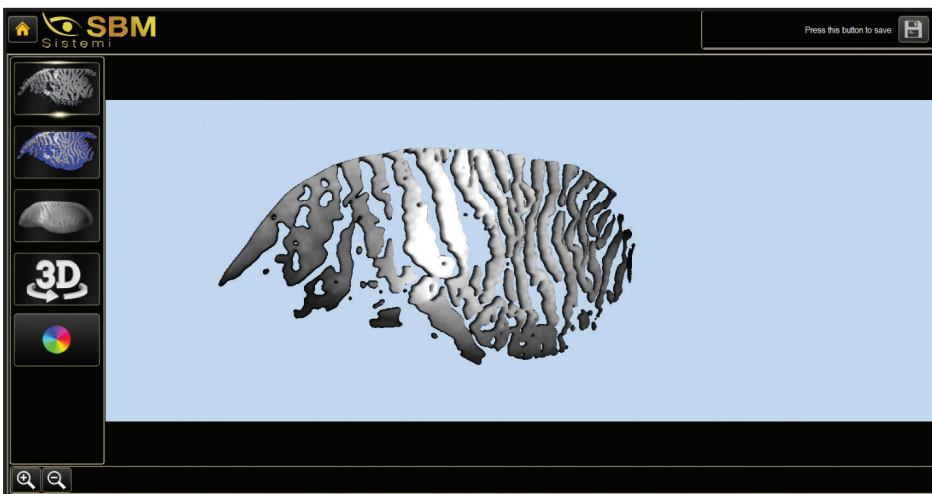
ADVANTAGES FOR THE PHYSICIAN:

- Ability to view the presence of abnormal gland structures in a high-resolution 3D image

- To be able to compare a normal patient gland profile with that of an MGD patient

- Evidence that supports the diagnosis in the case of evaporative dry eye disease and the explanation of the reasons for the choice of MGD therapy (including IPL)

- Compelling evidence to help the patient visualise what is happening to the Meibomian Glands

- Providing the reassurance that MGD is a contributory factor in the diagnosis of evaporative dry eye disease.

CYLINDRICAL DANDRUFF AND BLEPHARITIS
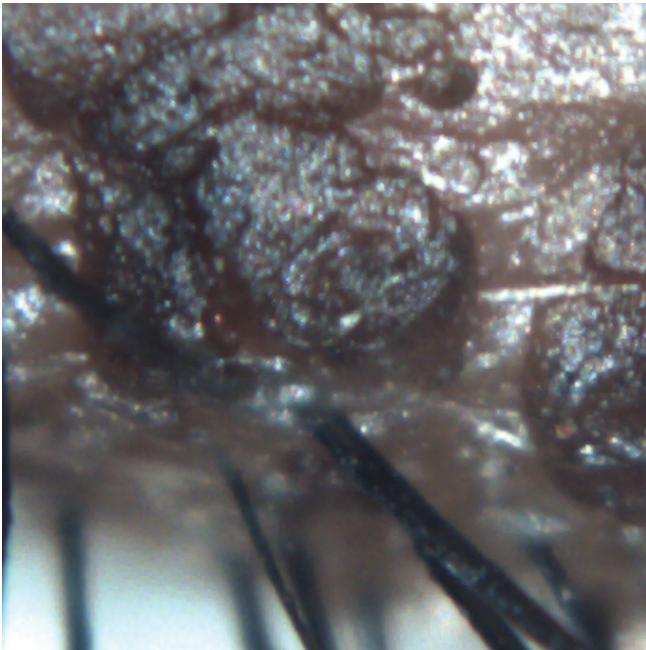
BLEPHARITIS AND CYLINDRICAL DANDRUFF

This test helps in the detection of blepharitis. It can be performed on the outer surface of the eyeball and eyelids.

The process includes:

- Analysis of the patient's history.
- Extrinsic detection of the eye structure, skin texture, and appearance of eyelashes.
- Examining the openings of the Meibomian Glands, base of the eyelashes, and eyelid margins using a bright light.
- Checking for abnormalities by evaluating the quantity and quality of tears.

The type of blepharitis can be determined based on the appearance of the eyelid edges. If the symptoms frequently exhibited by the patients are mildly sticking eyelids, thickened lid margins, and missing/misdirected eyelashes, then the type of blepharitis is diagnosed as Staphylococcal.
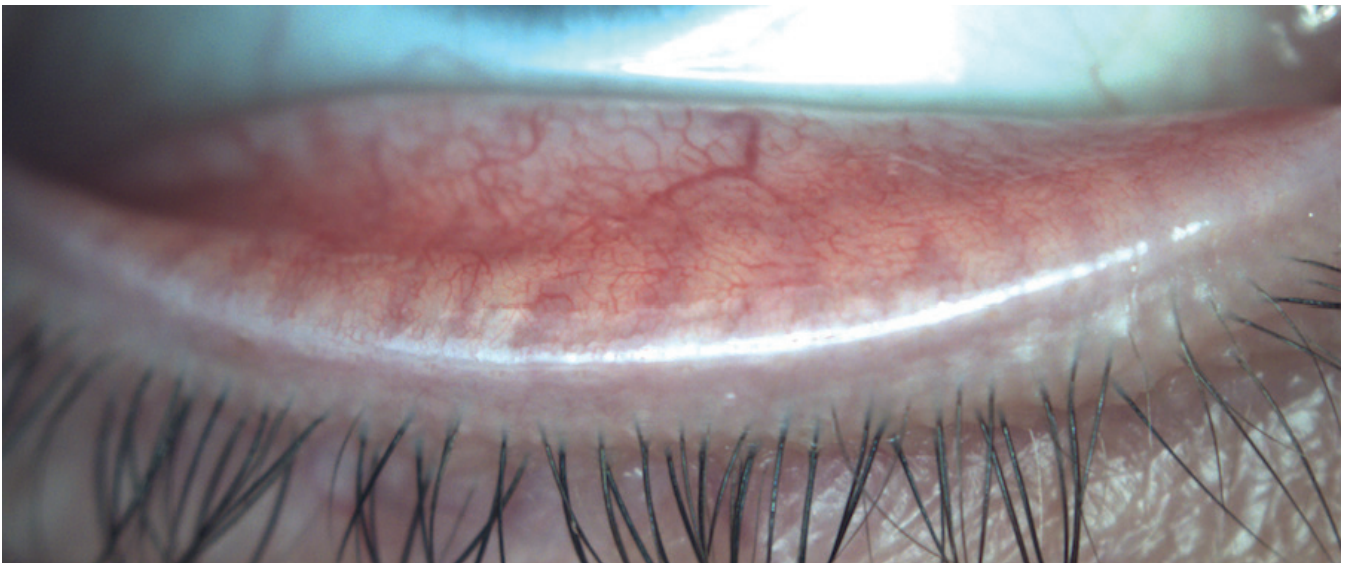
WHAT IS DEMODEX BREVIS?

Demodex brevis is a kind of mite found on the skin of humans. Like its counterpart Demodex folliculorum, D. brevis is naturally occurring. D. brevis is so small that mites can't be seen macroscopically.

The average mite causes noticeable reactions and problems in people largely infested.

Symptoms of D. brevis usually only occur in case of large infestations. Signs might include:

- Red skin
- Rough or tough skin
- Scaly or patchy skin

The symptoms of D. brevis are similar to those of D. folliculorum. The key difference is their location.

While D. folliculorum tends to stay on the face, D. brevis can distribute all over the body. Chest and neck are common areas of D. brevis infestation.

Once in the skin, D. brevis feeds of the product of the sebaceous glands. These glands are connected to hair follicles underneath the skin's surface.

Infestations of D. brevis aren't common in young children, but their numbers naturally grow with age. The mites may also be spread between humans.

OTHER POSSIBLE EXAMINATIONS

AN ASSESSMENT OF GRADING SCALES FOR MEIBOGRAPHY IMAGES

The evaluation of the Meibomian Gland dysfunction appears to be of increasing interest in research and clinical practice. Consequently, the evaluation of MGs morphology using Meibography is of high interest for both researchers and clinicians.
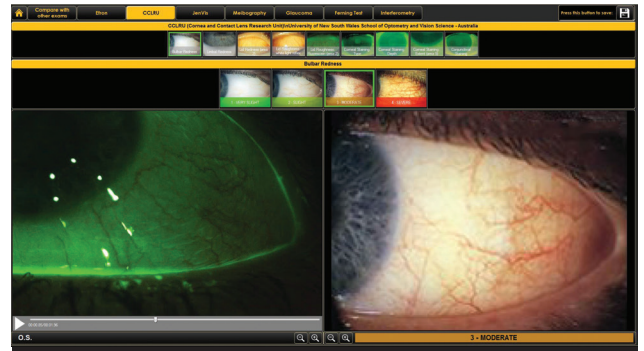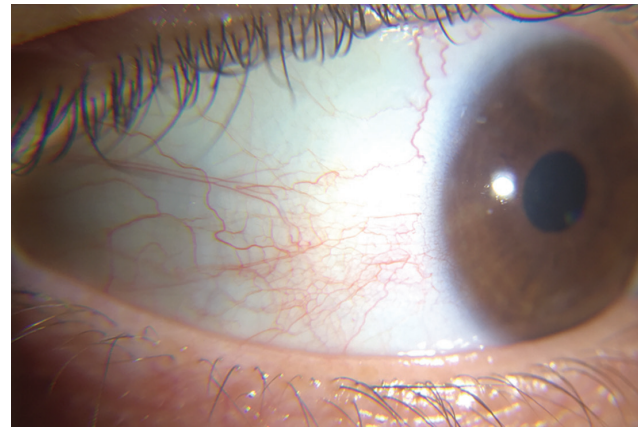

COMPARISON WITH THE MAIN INTERNATIONAL GRADING SCALES

EFRON - CCLRU - JENVIS - GLAUCOMA - FERNING TEST - MEIBOGRAPHY
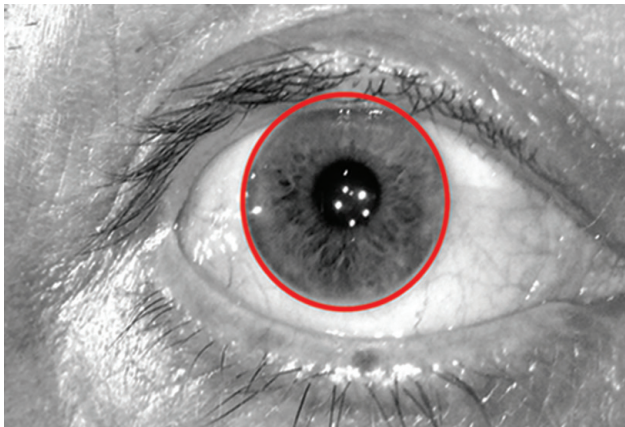
WHITE TO WHITE MEASUREMENT

Evaluation of corneal diameter from limbus to limbus (white-to-white distance, WTW).

BULBAR REDNESS CLASSIFICATION

Acquiring an image of the conjunctiva, it will be possible to compare the patient's condition with different international grading scales.

PUPILLOMETRY

The measurement of the pupil diameter has become increasingly important in the field of refractive surgery.
Larger scotopic pupil sizes may be partially responsible for the occurrence of postoperative symptoms such as halos, glare, and monocular diplopia.
Refractive surgeons also need an accurate scotopic pupil measurement to determine appropriate treatment zones for excimer laser, corneal, and intraocular surgery.

MD. VIGO TREATMENT SUGGESTION

SUGGESTIONS FOR DIAGNOSIS AND TREATMENT BASED ON CLINICAL PROCEDURE OF DR. LUCA VIGO AND STUDIO CARONES (MILAN, ITALY)

DATA RESULTS VIEW

A complete and dry eye-focused database allows to understand and properly diagnose the dry eye patient. With the useful data result tab, the ophthalmologist can check the complete tear film assessment, determining all deficiencies that cause the pathology and, in the meantime, understanding which treatment is needed to approach each case.

DIAGNOSIS SUGGESTION

Ocular surface data and pathology classification

Thanks to Studio Medico Carones with MD. Luca Vigo's experience, OS 1000 includes a suggestion algorithm able to share a possible treatment approach for each patient.

All suggestions can be useful for diagnosis and treatment.
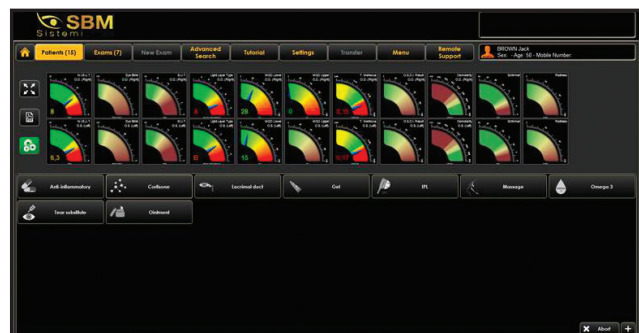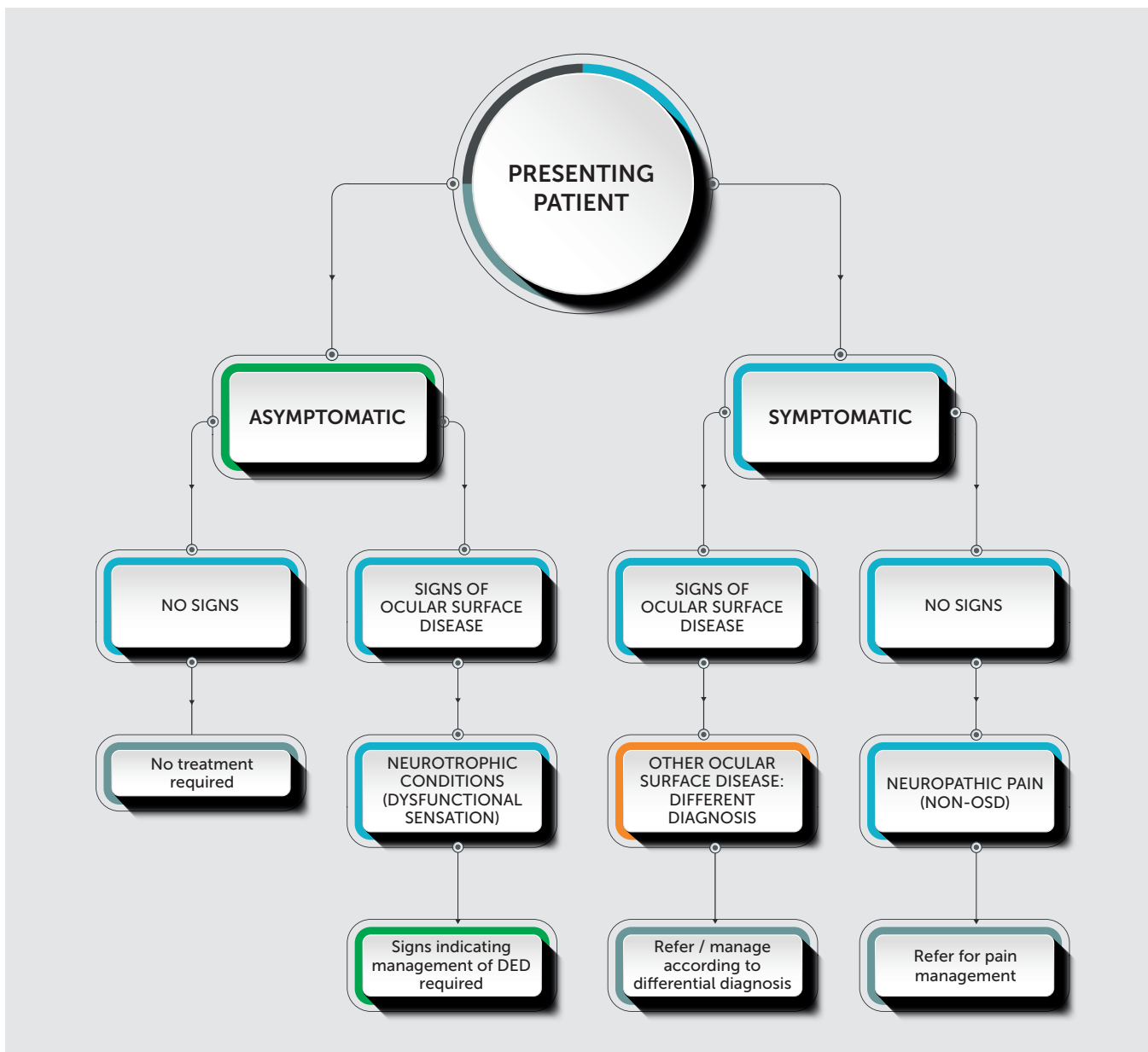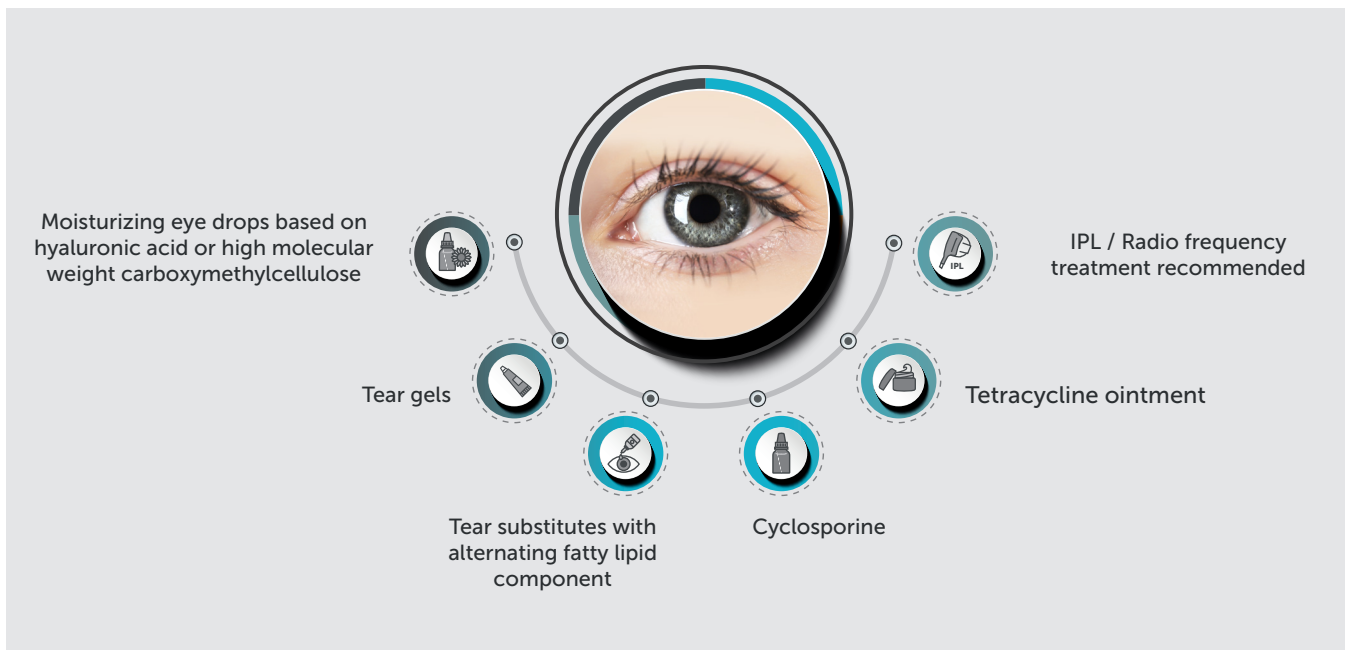
TREATMENT MANAGING

Through TREATMENT MANAGING tab, the software allows the physician to fill in the database with all drugs, integrators and treatments available in his practice.

Any treatment as vitamins, Omega-3, eye drops, hot packs and IPL/Radiofrequency, can be loaded on the software to prescribe the products of the brands that the doctor prefers. The whole report with the diagnosis and treatment suggested by the ophthalmologist will be printed directly.

Moreover, it is possible to store and reuse the treatments with other patients (e.g.: Bausch+Lomb Hyaluronic Acid 3 times/day every 8 hours, or Bausch+Lomb Hyaluronic Acid daily every hour for 3 months).

It is also possible to check and follow up the patient's treatment, in order to understand the clinical situation, the time spent from the initial examination, the progresses achieved (e.g.: IPL, 2 sessions already done and 1 missing).

Moisturizing eye drops based on hyaluronic acid or high molecular weight carboxymethylcellulose

IPL / Radio frequency treatment recommended

Tear gels

Tetracycline ointment

Tear substitutes with alternating fatty lipid component

Cyclosporine

PRESENTING PATIENT

ASYMPTOMATIC

SYMPTOMATIC

NO SIGNS

SIGNS OF OCULAR SURFACE DISEASE

SIGNS OF OCULAR SURFACE DISEASE

NO SIGNS

No treatment required

NEUROTROPHIC CONDITIONS (DYSFUNCTIONAL SENSATION)

OTHER OCULAR SURFACE DISEASE: DIFFERENT DIAGNOSIS

NEUROPATHIC PAIN (NON-OSD)

Signs indicating management of DED required

Refer / manage according to differential diagnosis

Refer for pain management

REPORT

DIFFERENT REPORTS AVAILABLE

The OS 1000 software is a dedicated platform for dry eye and allows, in addition to helping in the diagnosis and classification of diseases, to print and save various medical reports, offering the most professional and clinical solutions to patients.

For customer satisfaction, it is often advisable to provide technical documentation relating to the exams taken.

Thanks to the various press reports of the Sbm device, you will have the possibility to visually explain and simply demonstrate the pathology situation. Furthermore, it's possible to explain how the pathology has changed over time.