



Public hospital

Post-operative  
follow up

Specialist  
diagnosis

Screening  
service

Optometrist

Private  
ophthalmologists

Ophthalmic diagnostics anywhere, anytime



## CONCEPT

### ICP by SBM Sistemi

is an integrated diagnostic platform easy to use for anywhere and anytime.  
Connection to the most common telemedicine systems.

### The Most Important Results at a Glance

Focus on what is essential – your professional competence  
Delegate the entire measuring procedure to your assistants – instrumentation for the ocular surface and the anterior segment.

*“Unlike words, and their interpretation,  
the image is a neutral constant a benchmark  
reference frozen in time.*

*It becomes the quintessentially unbiased witness  
to the condition at the moment of capture”.*

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## COMPANY PROFILE

### History

The SBM was founded in 1984.

The core activity of the new company is to produce software for optical centers.

The territorial development begins with the opening of new distribution facilities on the Italian territory, especially to offer services and assistance. In the '90s, the company began its real growth path that is still the main goal for the future.

Thanks to large investments and sacrifices in those years began working for production.

Later in time also starts working as a provider of information technology services and optics and ophthalmology instrumentation.

After more than twenty years these services are still carried out at the office of our customers or our operating offices on the Italian territory and abroad.

The experience achieved over the years with important and prestigious brands allows us to be present on the market as a serious and reliable partners for Strategic Outsourcing services or part of them.

## Vision & Mission

Our vision at Sbm Sistemi is to bring new diagnostic system to market to ensure that people living without have access to primary healthcare and even more primary eyecare. Under such circumstances, villagers have to travel long distances and endure hardships to access basic eye care.

From an clean hospital room to a dirty tent in the desert. Our innovative and experienced team of scientists, physicians, researchers and business leaders have dedicated much of their lives to advancing treatments for eye diseases. This team has worked together extensively and values having an environment of collaboration, transparency and trust that results in accelerated and needed innovation.

Sbm Sistemi incorporates the research and innovative technologies developed by a team of medical researchers in the fields of diagnostic.

Sbm's mission is to overcome the complexity of adaptive optics, to make them practical and easy to use both for those who operate ophthalmic devices and for patients themselves. All Sbm sistemi products offer comfort, fast, easy, use and are 'mobile devices'.

## Mission Statement

Our mission at Sbm Sistemi is to provide surgeons and medical institutions with innovative diagnostic technologies that enhance, preserve and heal the conditions of people worldwide. We embrace this role as the market leader and prepare for their demands.

Our focus is on building the value of the company through ideas, innovation, technology and efficiency. The results will continue to be increased market share, revenue and income.

Our "mission completes" are the result of our people: our customers, employees and investors. Our successes will be the result of our ideas, planning, goals, execution, fair compensation and focused "innovation management".

Our fuel is multi-faceted: it is symbolized by our autonomy, determination, focus, creativity, consistency, resiliency, family and personal happiness.

### **Doct. Giordano FANTON**

MD, Surgeon - Specialist in Ophthalmology  
PhD in Clinical Sciences  
FEBO, Fellow European Board of Ophthalmology  
DiSSO, Diploma of Superior Specialist in  
Ophthalmology





# COMMERCIAL STRUCTURE

## Production

A good product must be made from a precise projecting including a careful materials choice. The final difference consists in availability of personalized solutions for every need.

SBM Sistemi customers have a complete post-sale support. Any request related to the software is solved with remote assistance from local partners or directly by the SBM company. Any need related to the hardware can be managed by our local partners all-over the world that, in constant contact with SBM company, have the opportunity to ship the instrument for complete check-up.

All SBM Sistemi products are realized with hi-precision by factory technicians. Pre-sale checks and verifications consist in 24 hours non-stop test session to ensure the quality of the components. Only after this task an instrument can be packaged and considered ready for delivery.

## Structure

Our offices encloses the brain and more important the heart of the company. Here our products are created and SBM people have all relations with dealers and customers around the world.

The modern factory located near Turin ensures continuous and workmanlike production because constantly under our control.

The stock of instruments, already tested by technicians, guarantees delivery within days from the order.





## Our Quality Policy

We are committed to provide our customers a competitive advantage by offering high quality products, innovative engineering and promises they can depend on. The foundation of this commitment is our employees and their focus on compliance with our quality system requirements and the effective implementation of quality system requirements, continuous improvement and outstanding customer service.

## Made in Italy

The term "Made in Italy" is the process of reassessment of craft and industrial production that has often led Italian products to excel in international business competition. Over time Italian products abroad have earned a high reputation and started to constitute a separate category respectively in each of the affected product fields. Italian products are generally recognized as a remarkable achievement, attention to detail, imaginative design and shape, durability.

During the year SBM Sistemi participates to international fairs, congress and exhibitions.

We maintain an effective quality system by managing product risk and executing objectives related to:

1. Product development and improvement
2. Quality system planning and improvement
3. Supplier quality assurance
4. Personnel training and competence
5. Regulatory compliance and internal/external audits
6. Process effectiveness and efficiency.

## Our customer

- Local Health Organization
- Public and University Hospital
- Rest and Health Private Clinic
- Hospital Construction Company
- Medical Equipment Manufacturer

**Francesca Borioli  
e Nicoletta Summo**





### Quality Control

All SBM Sistemi Medical products are supplied CE marked in accordance with the Medical Devices Directive 93/42/EEC and also conform to a variety of international standards as applicable.

However, the Sbm sistemi Medical internal commitment to product quality goes beyond adherence to internationally recognised standards and extends into the attitude of our highly trained production staff and dedicated Quality Team, who are always mindful that the products they manufacture are used to save lives in critical care applications both locally and across the world.

### Customer Focus

- Clinical studies and presentations
- Congresses
- E-Marketing
- Customer relationship - marketing actions
- Continuous trainings
- Technical specifications sheets
- Magazines and advertisements
- Symposiums
- Web 3.0
- Social networks (Facebook, Twitter, YouTube)



# I.P.L. TREATMENT DIAGNOSIS

Today many company distribute devices for the treatment of Dry Eye and MGD (Meibomian Gland Disease).

A new and attractive approach in order to solve the cause of Dry Eye with fast and effective treatment.

Treatment itself is based on removing causes of inflammation from skin and eyelids thanks to the IPL effect.

Nevertheless, an outstanding diagnostic evaluation is needed to demonstrate to the patient the effectiveness of the IPL treatment. Best option is to provide a subset of examinations before and after IPL sessions to assess Dry Eye level and achieved results.

On the other side, a simple and inexpensive diagnostic tool is the best and most attractive bundling argument together with IPL unit for your doctors, enabling them to proper promote IPL treatment in their practices.

We realized a portable diagnostic platform for Dry Eye evaluation including:

- Tearscope (tear film screening)
- Meibomian Gland Analysis (meibography)

These diagnostic tools are completely modular and based on iPad.

the protocol in the system will allow to carry out a series of analysis votes to quantify the problematic of the patient.

Thanks to this digital system, your doctor will be able to show the patient either eloquent images, or the results of the examinations, so as to better explain both the pathology that the recommended treatment.

"We support  
IPL distributors"





## *WHY CHOOSE I.C.P.*

Dear professionals,

the aging of the population, the high expectations for a better quality of life and lifestyle of modern society require a better, more efficient and economically sustainable health care.

Crucial elements to meet these expectations are the progress in understanding of human body functioning at molecular and Nano metric scale, as well as the ability to intervene in a pre-symptomatic, acute or chronic stage of illness.

In diagnostics the ultimate goal is to identify the disease as early as possible, ideally at the level of its manifestation in a single cell. To achieve this, research and development activities must be undertaken in technologies field to improve the efficiency of diagnosis stage.

SBM Sistemi technologies can provide diagnostic tools with characteristics of sensitivity, specificity and reliability, plus the ability to record several measures or to integrate different analytical steps.

In general terms the mobile technology will have a great impact on the methodologies available for both the diagnosis of diseases and the discovery of new drugs. It will be possible to get early and reliable diagnosis using advanced detection systems.

Thanks to its evolution, the ophthalmology market is heading in increasingly innovative and decisive directions. For some time now, in fact, has come the need to use portable and reliable equipment and diagnostic tools every time and everywhere, limited so far by their size and characteristics to be used only within the consulting room.

With SBM Sistemi unique innovation, designed and created entirely in Italy, from now on you can carry your own professionalism and examination room according to your needs. We are pleased to announce the birth of the first portable refraction unit in fully digital platform that will allow you screening and diagnosis tests in the easiest and most innovative way ever designed.

# MEDICAL CERTIFICATE

The CE marking is the affixing of a brand by the Manufacturer that certifies that the product is accordant to the essential requirements required by UE Directives. In case of Medical Device it concerns safety and efficacy requirements that the devices and their productive system must to have.

Harmonized Norm to the Directive 93/42/CEE is the standard ISO 13485:2012 Medical Devices-Quality Management Systems - Requirements for regulatory purposes, that specifies the requirements for Management System of Organizations Quality that produce Medical Devices and is useful to demonstrate that the Medical Devices and the related service answer to the requirements of law and to the end user needs. The CE Marking route expects a series of obligations at the expenses of the Manufacturer and the intervention of a Notified Entity to specific risk classes.

The medical devices (generally) - Directive 93/42/CE (MDD)

Diagnostic devices in vitro - Directive 98/79/CE (IVD)

Standard compliance

EN 60601-1-2:2007

EN 60601-2-57:2011

All instruments for visual screening I.C.P. are certified and registered at the Ministry of Health like "Medical Devices in class I" valid for Europe.

ID registration BD/RDN

**I.C.P. IOL** registration number at the Ministry: 1340867/R

**I.C.P. SLIT LAMP** registration number at the Ministry: 1340861/R

**I.C.P. SLIT LAMP PLUS** registration number at the Ministry: 1340862/R

**I.C.P. TEARSCOPE** registration number at the Ministry: 1340864/R

**I.C.P. MEASUREMENT** registration number at the Ministry: 1340865/R

and more

Furthermore all devices are certified CE and are accordant to the European regulations in force.

## Registration made in the following extra cee countries

- KOREA
- AUSTRALIA
- SINGAPORE
- EUROPA
- FILIPPINE
- INDONESIA
- MALESIA
- SUD AFRICA
- IRAN
- USA (pending)
- OCEANIA
- CANADA





# DRY EYE SYNDROME

Homeostasis of the tear film involves delicate hormonal and neuronal regulatory mechanisms. The eye appears to be a target organ for sex hormones, particularly the androgens, as they modulate the immune system and trophic functions of the lacrimal glands and the functioning of the meibomian glands.

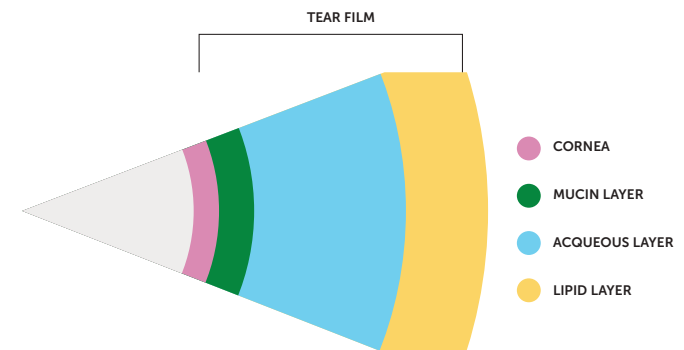
The cornea, lacrimal glands, mucous cells, and meibomian glands are all richly innervated, indicating the importance of nervous regulation in their function. Parasympathetic, sympathetic, and sensory innervation play complex stimulatory or inhibitory roles, and neuronal pathways interact via complex surface results cascades.

Abnormalities at any point in these pathways can cause overall dysregulation of lacrimal function. Whatever the initial causes of dry eye, chronic dryness of the ocular surface results in inflammatory reactions and gradual destruction of the lacrimal glands and conjunctival epithelium.

Once dry eye disease has developed, inflammation is the key mechanism of ocular surface injury, as both the cause and consequence of cell damage. In practice, dry eye can be associated with Sjögren's syndrome, allergies, infection, blepharitis, and preservative-containing eye drops.

## Wizard protocol

The system, thanks to analysis protocol, will guide you through the necessary examinations for the diagnosis.





## Dry eye syndrome

(DES), also known as dry eye disease (DED), keratoconjunctivitis sicca (KCS), and keratitis sicca, is a multifactorial disease of the tears and the ocular surface that results in discomfort, visual disturbance, and tear film instability with potential damage to the ocular surface. Dry eye syndrome is a common form of ocular surface disease (OSD) and may overlap with other causes of OSD, such as ocular allergy and meibomian gland dysfunction (MGD).

### **THE FOLLOWING ARE THE MOST COMMON COMPLAINTS ASSOCIATED WITH DRY EYE SYNDROME:**

- Foreign-body sensation and ocular dryness and grittiness
- Hyperemia
- Mucoïd discharge
- Ocular irritation
- Excessive tearing (secondary to reflex secretion)
- Photophobia
- Fluctuating or blurry vision





# THE PROTOCOL FOR THE RESEARCH AND THE CLASSIFICATION OF THE DED

## DED (Dry Eye Disease)

Dry Eye is a multifactorial pathology of the tears and the ocular surface that brings symptoms like discomfort, visual disturbances, instability of the tear film with potential damage to the ocular surface. It is accompanied by an increase of the osmolarity of the tear film and by the inflammation of the ocular surface. The term Dry Eye includes different typologies and classifications of the same pathology.

The different degrees are determined thanks to the individuation of the typology of tear deficiency. In this classification are included:

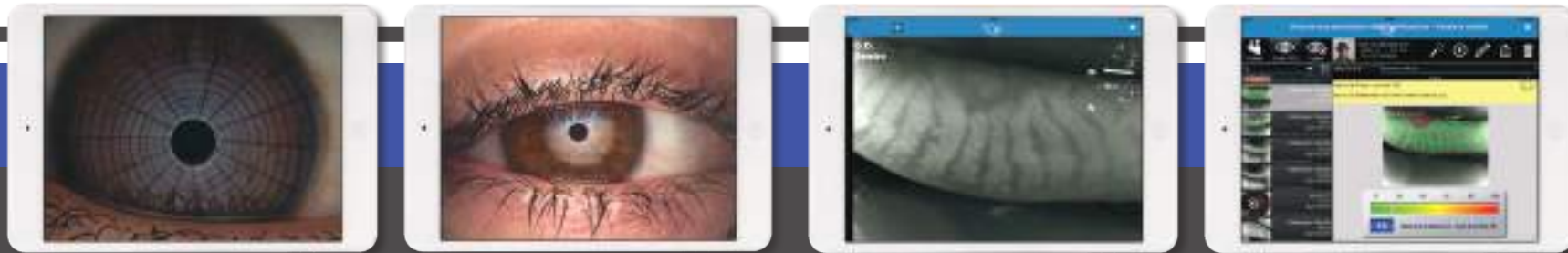
- Dry eye by reduced tear production (ADDE)
- Dry eye by augmented evaporation (EDE)
- The pathologies of eyelids symptomatic, including Meibomian Glands Dysfunction (MGD).

## I.C.P. Dry eye

Thanks to the innovative protocol I.C.P. Dry eye (usable with I.C.P. Tearscope and MGD), in a few and fast steps inside a wizard will be possible to classify in automatic and precise way the dry eye category in relation to the made examinations so as to be able to undertake the treatment more suitable for the solution of the problem.

Exploiting the technology of I.C.P. Tearscope, will be defined on which tear layer there is a deficiency, analyzing singly:

- Thickness of the lipid layer LLT
- Mucin analysis (through N.I.B.U.T. o B.U.T.)
- Quantitative analysis of the aqueous layer with calculation of tear meniscus
- Classification of possible corneal / conjunctival Staining.



ICP Tearscope allows to quantify directly and indirectly each single layer:

- Analysis stability and calculation of the lipid layer thickness
- Analysis of the break up time of the lipid layer invasive or with installation of fluorescein
- Analysis meniscus tear with calculation of automated heights and parameters

### Area calculation

Subsequently, through the I.C.P. MGD technology, with a simple photo will be ascertained the state of the Meibomian Glands that in a guided way will calculate the area of loss and the active area of the glands.

- The instrument in a few seconds allows to take photo with 8MP in resolution in infrared vision, making visible in each environment condition the presence/absence of the glands on the eyelid.
- The analysis of the glands happens in a guided way thanks to the advanced recognition software that studies the eyelid through the use of dedicated filters in real time after the acquisition.

### Test

With more optional test like the inserting of:

- Osmolarity value
- Schirmer Test value
- Phenol Red value

In a guided way I.C.P. Dry Eye will evaluate, thanks its protocol, the effective category of dry eye, allowing a more focused and decisive treatment.

Made the various tests and filled up some optional parameters I.C.P. Dry Eye will indicate automatically the category:

- EDE (Evaporative Dry Eye)
- ADE (Aqueous Dry Eye)
- MGD (Meibomian Gland Disease)

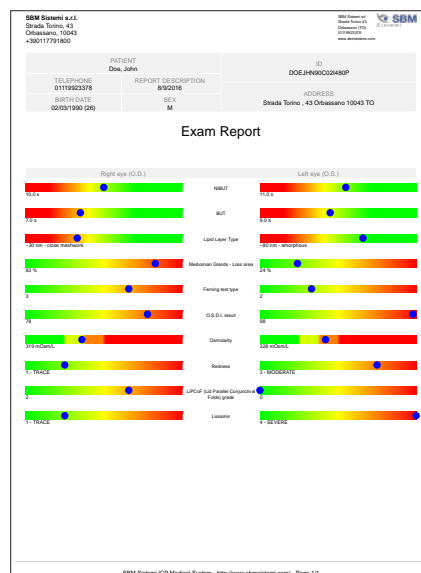


# NEW RESULTS AND EXAMS

These values have been grouped in a new section in the exam results screen with all these new values. All values from "Grading scales" were deliberately put together in a single section later providing the ability to filter the values seeing only those of interest (Redness, Staining, ...)

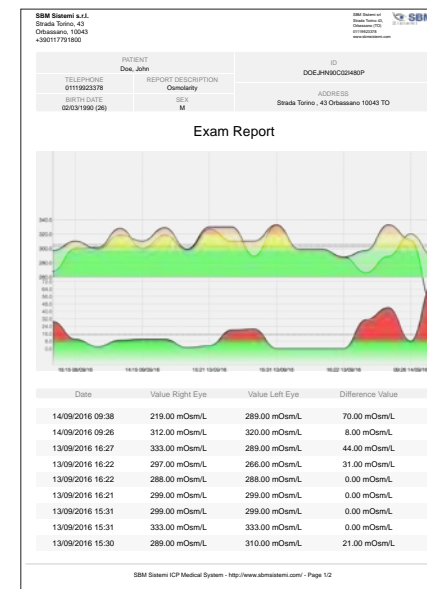
## Daily report

with all exams values of a given day  
Report with values and graph of a specific exam value (nibut, osdi, osmolarity)



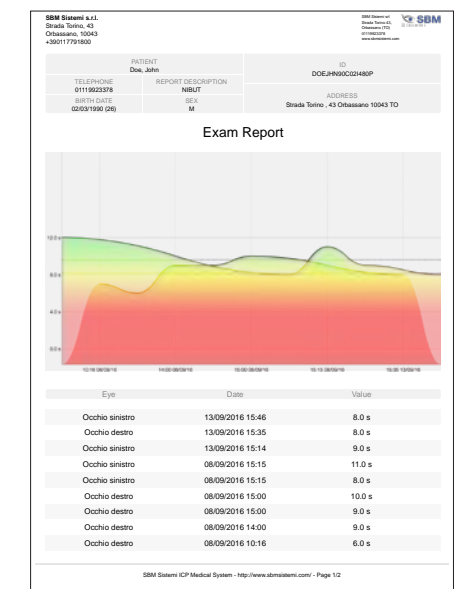
## Osmolarity

Values and graph of osmolarity values



## N.I.B.U.T.

Values and graph of nibut values





# HOW IS DRY EYE SYNDROME TREATED?

## ARTIFICIAL TEARS

Eye drops that increase eye moisture are among the most common treatments for dry eye syndrome. Artificial tears also work well for some people.

## LACRIMAL PLUGS

The doctor might use plugs to block the drainage holes in the corners of your eyes. This is a relatively painless, reversible procedure that slows tear loss. If your condition is severe, the plugs may be recommended as a permanent solution.

## MEDICATIONS

The medication most commonly prescribed for dry eye syndrome is an anti-inflammatory called cyclosporine (Restasis). The drug increases the amount of tears in your eyes and lowers the risk of damage to your cornea. If your case of dry eye is severe, you may need to use corticosteroid eye drops for a short time while the medication takes effect. Alternative medications include cholinergics such as pilocarpine. These medications help stimulate tear production.

If another medication is causing your eyes to become dry, you may switch your prescription to try to find one that doesn't dry out your eyes.

## PROBING

It consists in cleaning the Meibomian glands with a special cannula. It's a non-invasive outpatient treatment that is practiced with a single drop of anesthetic eye drops and effectively solves the dysfunction of the Meibomian glands.

## LIPIFLOW

A thermal pulse, which has revolutionized the treatment of dry eye caused by Meibomianitis immediately improves not only the symptoms, but almost always solves the disease.

## PULSED LIGHT

The IPL, IPL or newly IRPL (Regulated Intense Pulsed Light), is a next generation device that creates a new type of pulsed polychromatic light that stimulates the Meibomian glands to resume their normal functioning.





# OCULAR SURFACE ANALYSER SOFTWARE

Expertise and experience. We are witnessing an explosive growth in medical devices that use wireless technologies. The data from these sensors and monitoring equipment together with patient observations of daily living can be transmitted wirelessly to another location for review by relevant specialists.

The new ICP mobile app devices lets you diagnose a number of diseases such as the Dry Eye

Efficient, Intelligent & Intuitive

- Training
- Trust
- Reliability
- Data Security

Uniquely customizable to each physician's individual workflow and distinctive charting preferences, the ICP solution can work the way you want.

ICP blazes a new trail in Ophthalmic Asynchronous Telemedicine and features:

A complete diagnostic package including:

- Patient history
- Acuity test information
- Measurement history
- Follow up
- Comparison of detected images at different times
- International grading scale
- Slit light, diffuse light and fluorescein photographs

Lightweight, portable and easy to set up.

The user interface is intuitive, users can operate the system without reference to a user manual. It transmits the eye information from emergency departments, clinics, doctor's surgeries, remote hospitals or screening centers to a specialist for diagnosis and/or screening.

Designed to be used in locations remote from the specialist's practice as well as in the practice. It extends your practices reach, meaning the specialist can virtually be in two places at the same time diagnosing patients.

Specialist interface to allow easy interpretation of diagnostic package icp provides increased convenience and efficiency for the specialist.

If the specialist is not near the office/practice or hospital, information can delivered by email.

A device interface allows other diagnostic devices such as your corneal topographer to be connected and data to be sent.

Emergency information can be sent at any hour no matter where the specialist is.

## Screening Service

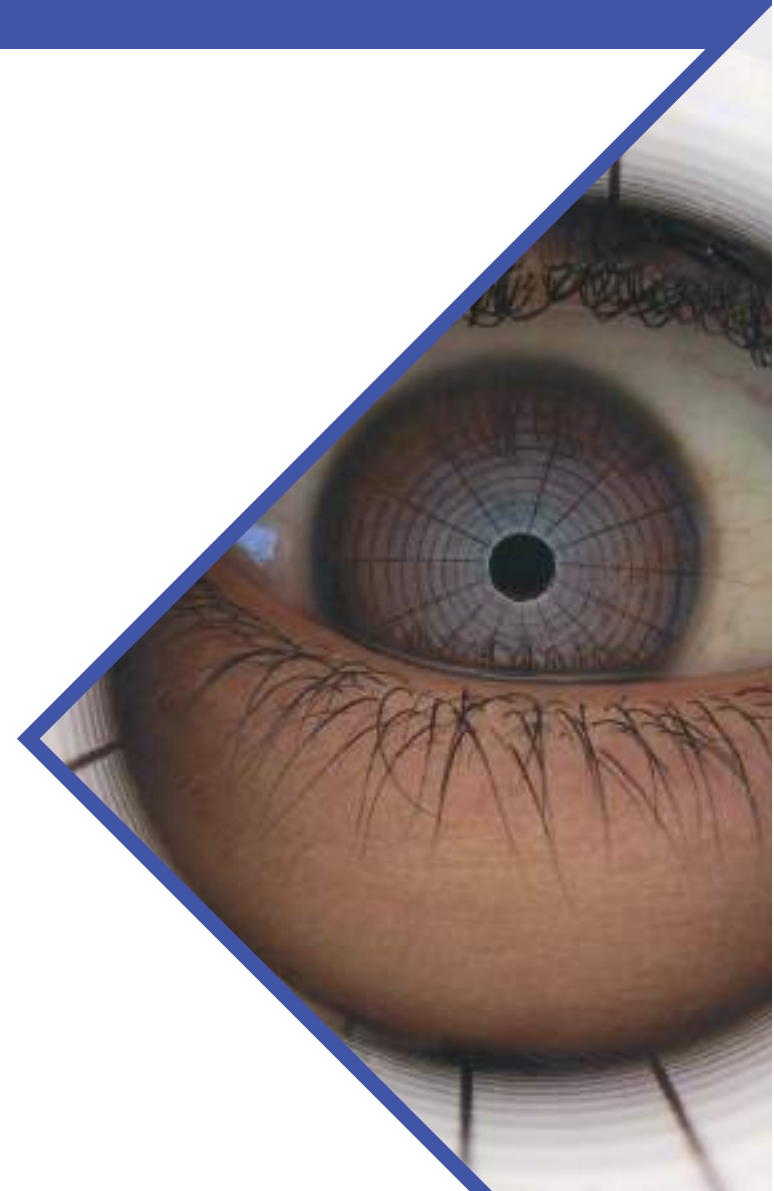
A standard diagnostic package provides ideal reference for screening.

High resolution images of the Anterior segment showing details of the injury or disease. Slit light, Diffuse light and Fluorescein photographs can be provided. A review and send feature that allows the user to review the diagnostic package and the remote specialist details prior to transmitting the information.

Quick documentation with international grading scale.

Documenting conditions and symptoms is faster and more accurate using intuitive templates.

Auto Check-In Kiosk feature lets the patients Check-In on their own. This feature reduces workload and helps in managing a high patient flow.





### Type of exams

- Exam in slit lamp
- Exam in Fundus camera
- Exam in backlight
- Tearscope
- Analysis of Meibomian Glands
- Calculation of cyclotorsion's system for insertion of toric IOL
- Data analysis for the Oculoplastic surgery
- Ferning test
- Amsler test
- Optotype for visual acuity measurement
- etc...

### POSSIBILITY OF IMAGE MANIPULATION

The captured image can be re-elaborated, allowing to highlight details of the patient's eye.

### VIDEO MANAGEMENT WITH THE EDITOR POSSIBILITY

Editor movie with possibility vision frame on frame, choose of image and possibility to save it.

### USE OF THE TABLES OF EFRON, CCLRU, JENVIS

Comparison image of patient's eye with the respective rating scales of EFRON, CCLRU, JENVIS.



## The software functions present in all versions of the program

- Comparison of database's images
- Saving of images and movies comparing the situation before and post application
- Direct comparison with the taken images and the tables of Efron
- Direct comparison with the taken images and the tables of CCLRU
- Direct comparison with the taken images and the tables of Jenvis
- Possibility to point out and to show to your patient the pathology
- Evaluation of the visual acuity from a distance
- Evaluation of the visual acuity from close
- Show visually with the help of the iPad the difference between the use of the lac and the use of the ophthalmic lens
- Database dedicated and structured for the saving of the sensible data and of the made exams during the time.
- Technical follow up targeted to the LAC application.
- The electronic medical record with the essential registry of the Patient
- The medical history of the patient
- Optometric data
- Results of examinations
- Privacy management
- The archive of images and movies (photographs and radiographs)
- Test and results
- Follow up visits allowing the simultaneous visualization of images related the next visits. With this function is possible to evaluate the upgradability of the pathology through direct comparison
- Reporting and printing





## I CLOUD

### Windows system

A practical personal archive to bring always with you

A practical archive connected in Wi-Fi with the various ICP medical instrumentation

The electronical medical cartel that includes:

- The essential patient registry
- The history
- The formula of the current therapeutic cycle
- The descriptive diary of the made interventions
- The archive of images
- Report

With this module is possible to manage the database of patient, his history, the medical examinations, the surgical interventions and their Follow Up.

It follows that, through a unique screen, will be possible to visualize the whole clinical history of the patient and will be made all related prints.

The doctor has then, at the end of the visit, the possibility to print and deliver to the patient a report that presents only the data of the clinical cartel that he considers appropriate, inserting also a textual discursive section. He can also choose to send these documents via email.

### I Cloud management

- Sending telemedicine DICOM exams
- Multisite/multi iPad with synchronization between them to visualize all medical reports from a computer
- External memory to download exams when the memory of the various supports is finished
- Backup and recovery of the achieve
- Access to the exams by pc with QR code
- Working also in background
- Saving photo and video on FTP instead that on the device to safeguard the space

# APPLE WATCH APP



With watch OS 3, you can send all the information related to the diagnostic results made directly on the APPLE WATCH of the patient, so that it can store and search the data.

A practice board, including graphics useful to inform the patient on the evolution of the treatments or a useful guide to remember the drugs to be used.

How to communicate the data to your patient so comfortable and safe?



# TELEMEDICINE

It collects a standard package of diagnostic information from a patient at any location and transmits it to a specialist at any site for diagnosis and/or screening. The specialist views the patient information in an easy to use browser and communicates patient instructions back to the remote site.

## Why telemedicine

Telehealth systems enable the healthcare industry to cope with an ever-increasing elderly population and the associated chronic diseases.

The ageing of the world's population is a fact in our society. Baby boomers are now becoming our senior citizens, fuelling the growth of the aged population. To accommodate this dramatic population shift drastic changes in our health systems are necessary. Today, these changes include new therapies and early diagnostic tools based on advanced sensor and microcontroller (MCU) technologies that are accessible by the general population.

Non-communicable diseases account for almost 50% of the global disease burden, according to the World Health Organization (WHO). Among these, the highest incidences are for chronic degenerative diseases, such as cardiovascular disease, in which hypertension plays a large part (600 million people worldwide), as do metabolic diseases like diabetes (90 million people).

Telemedicine that is easy to use for medical ancillary staff, nurses, GPs or specialists. It collects a standard package of diagnostic information from a patient at any location and transmits it to a specialist at any site for diagnosis and/or screening.

The specialist views the patient information in an easy to use browser and communicates patient instructions back to the remote site.



## Our project in telemedicine

We are working for an innovative web tele-diagnostic application dedicated to the world of Vision. The mission is to make easily available rapid reporting of the main Ophthalmological diagnostic tests, according to the European laws about sensitive data protection.

This service will offers expertise and professional skills of a huge number of Ophthalmologists. Physicians will report only exams acquired by Sbm and other system that are selected diagnostic centers really easily accessible by patients.

The reporting will be granted within 72 working hours after acquiring data, although statistically, thanks to Ophthalmologists professionalism and cooperation, the report will be performed within 24 hours. The project's goal is to even reduce this timing in order to provide to the patients a fast, safe and effective eye care service. The spread out of this diagnostic network will allow patient to get the nearest doctor in order to access immediately to a diagnostic service and a skilled Specialist reporting without any waiting list and at convenient price.

The web-application is written in dynamic multilingual, translated into the main foreign languages, in order to allow an international use, anticipating the recent European Community provisions about health care. Finally the patient will have the opportunity to save all his exams on his personal account without any loss or damage risk. By the use of a free mobile app (compatible with iOS, Android and Windows Mobile), the patient will can also share his exams with his Family Doctor or ask for a second opinion to his Ophthalmologist.

The website has been developed with the latest technology IT, ensuring technical reliability and operational safety in the management and storage of data and guarantee of privacy in compliance with current legislation.





## I.C.P. MGD ANALYSIS MEIBOMIAN GLAND DISEASE

Through an acquisition of images, or by infrared camera, it allows the evaluation of the gland.

The criticality is made through five-level scale. The evaluation scales are an essential instrument for the registration and for the clinical monitoring of the modifies to the ocular tissues.

These scales are used to evaluate the gravity of a wide range of conditions, included those associated to the contact lenses.

The dysfunction of the Meibomian Glands (MGD, Meibomian Gland Dysfunction) is caused by a chronic alteration of the sebaceous glands that are located inside of the eyelids.

Thanks to the modular double LED illumination, the image will result ever without reflections and side effects. The instrument has the possibility to be used in a portable way or like fixed instrument in your clinic, exploiting a support that you can insert inside the hole of the tonometer on the slit lamp.

### TECHNICAL SPECIFICATIONS

<b>TYPOLGY</b>	Device for evaluation of the meibomian glands
<b>CAMERA</b>	Coloured,sensitive to infrared (NIR)
<b>RESOLUTION</b>	8 MPx
<b>LIGHT SOURCE</b>	Infrared LED
<b>PART EXAMINED</b>	Upper and lower eyelids
<b>RATING</b>	Calculation of the extension percentage in the glands detected through selection made by the operator or with recognize in a guided way
	Calculation of percentage of missing glands
<b>GRAPHIC RESULT</b>	Coloration absent area and present
<b>TOOLS</b>	Editor to highlight the area of the glands to be evaluated



Invented and developed 100% in Italy

Medical instrument in CLASS I registered to the Ministry of Health

Medical electrical equipment CLASS I complies with the norm En. 60601-1.

The technical features of the instrument and its accessories can be improved in any time and without notice.

To obtain an updated description we suggest to visit the website [www.sbmsistemi.com](http://www.sbmsistemi.com)



I.C.P. MGD: the new instrument made in Italy by futuristic design is the simplest instrument of structural and qualitative research of the Meibomian Glands.



In a few seconds the instrument allow to take photo with 8MP resolution in infrared vision making visible in every environmental condition the presence/absence of the glands on the eyelids.



The analysis of the glands happens in an automatic way thanks to the advanced recognition software that studies the eyelid through the use of dedicated filters in real time after the acquisition.

System analysis of the images obtained through a sensitive infrared camera (NIR) in order to locate in a guided way:

- The position detected from the image, valid both for the superior both for the inferior part of the eye
- Calculating percentage of the extension in area of the present glands, taken by the operator
- Calculating percentage of the area of the missing glands
- Absent and present coloring area
- Classification in 4 different degrees
- Loss between 0 and 25%
- Loss between 25 and 50% in yellow
- Loss between 50 and 75% in orange
- Loss between 75 and 100% in red
- Through the editor system is possible to modify the brightness of the picture for a better evaluation.

## Meibography

It serves to build the morphology, diagnosis and drop out of the Meibomian Glands and for the diagnosis of the vital dysfunctions.

Meiboscopy is the visualization of the glands through trans-illumination of the eyelid with infrared light.

The software allows to analyze the working and not working areas, and to compare the glands of the patient with the diagnostic evaluation scales.





### Automatic detection module area of Meibomian Glands

ICP can, in case of a good quality of image, in a guided way detect the length and width of meibomian glands imaged by infrared meibography without requiring any input from the user.

The images are then automatically classified.

### Problematic evaluation of the dry eye

For dry eye diagnosis are recommended a series of exams:

- Measurement of the blinking frequency and calculation of the inter blink interval
- Measurement of the height of the lower tear meniscus
- Measurement of the tear osmolarity (if available)
- Calculation of the tear film break up time (TFBUT) and the index of ocular protection (OPI)
- Classification of the corneal and conjunctival coloration with fluorescein
- Schirmer Test
- Phenol red test
- Quantification of the morphological characteristics of eyelids
- Squeezing: quantification of the squeezability and of the quality of the lipid component
- Meibography: quantification of atrophy.



## Meibomian gland dysfunction (MGD) may well be the leading cause of dry eye disease throughout the world

Meibomian gland dysfunction (MGD) is a chronic, diffuse abnormality of the meibomian glands, commonly characterized by terminal duct obstruction and/or qualitative/quantitative changes in the glandular secretion. It may result in alteration of the tear film, symptoms of eye irritation, clinically apparent inflammation, and ocular surface disease.



These glands produce oily lipid substances that are released to the eyelid margins reaching the tear film thanks to eyelid winks.

Oily lipid substances floating on the surface of the tear film and needs to reduce evaporation.

The MGD alters the lipid component of the tear film and this can cause the appearance of an evaporative dry eye with its characteristic symptoms.

In severe cases, the MGD can also cause inflammation of the eyelids called blepharitis rear edge.







# TEARSCOPE

## (Tear Film Screening)



The scattered light emitted by the I.C.P. allows to evaluate the interference fringes caused by the “quality” of the tear film and to classify them in different pattern tear.

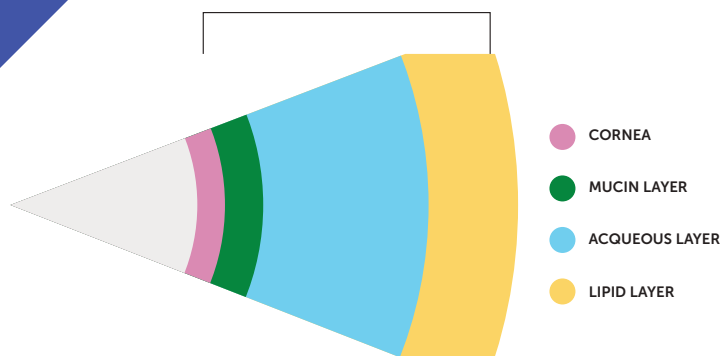
The observation of the lipid layer allows us to intervene in a targeted way, evaluating the use of a particular artificial tear, an integrator or the presence or not of lacrimal abnormalities.

- Quantitative test that evaluate the quantity of basal and/or reflected secretion
- Qualitative test that evaluate the functionality and the stability of the tear film
- N.I.B.U.T.: the observation is made without the use of fluorescein
- Dystrophies with Placido's rings without fluorescein.

### TECHNICAL SPECIFICATIONS

<b>TYPOLGY</b>	Tear Film
<b>IMAGE RESOLUTION</b>	From 8 to 12 mp
<b>ACQUISITION MODE</b>	Multi shot, tube
<b>FOCUS</b>	Autofocus, manual focus
<b>ISO MANAGEMENT</b>	Variable
<b>MAGNIFICATION</b>	4x to 8x magnification with change via software
<b>GRIDS</b>	Placido disc, NIBUT grid
<b>FILTERS</b>	Yellow filter
<b>LIGHTING</b>	White led - Blue led

TEAR FILM



Invented and developed 100% in Italy  
Medical instrument in CLASS I registered to the Ministry of Health  
Medical electrical equipment CLASS I complies with the norm En. 60601-1.  
The technical features of the instrument and its accessories can be improved in any time and without notice.  
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Analysis of the break up time of the lipid layer invasive or with installation of fluorescein



Analysis stability and calculation of the lipid layer thickness



Analysis meniscus tear with calculation of automated heights and parameters

### ICP Dry eye analysis

I.C.P. Tearscope the new instrument of individual analysis of lacrimal layers that allow with a quick detailed structural research of the tear composition.

Possibility of research on the single layers:

- Lipid
- Aqueous
- Mucin

Thanks to ICP Tearscope is possible to identify the type of DED(Dry Eye Disease) and determine which deficient layers can be treated with a specific treatment.

### ICP Tearscope allows to quantify directly and indirectly each single layer

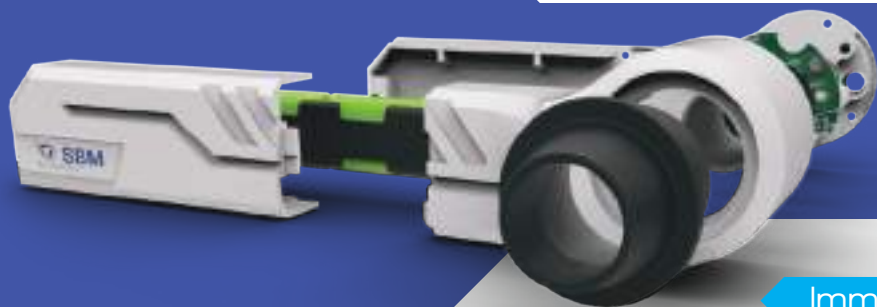
With white LEDs lighting displays in vivo the phenomenon of interference fringes possible to assess the thickness of the lipid component of the tear and run the NiBUT.

With blue LEDs lighting (with the fluorescein) creates a large area and allows you to perform the BUT and look fluorescein of large diameter scleral and mini scleral contact lenses type.

### Mucin layer and water layer analysis

The layer watery is evaluated on the meniscus tear categorizing in different categories and possible issues related this. The measurement in mm allows without invasiveness the direct evaluation of the quantity.





### Immediate interpretation and follow up

Through the use of GRADING SCALE dedicated to each value obtained from the exams, the interpretation of the obtained data results easy and immediate making the iPad a real platform dedicated to the analysis of dry eye with detailed temporal graphics that allow to demonstrate in simple steps the need of the treatments and then the effective functioning of these!

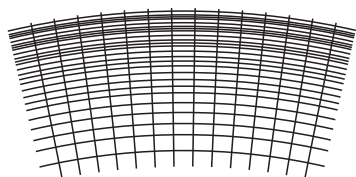
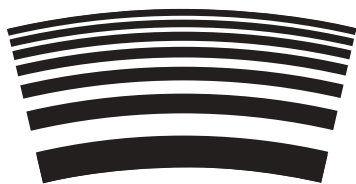
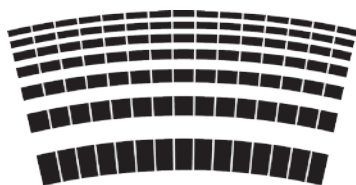
### Supplied accessories

The system is provided with a kit of useful grids to perform various screening, all filters are already present in the system software and includes tests to evaluate and diagnose dry eye problems and can recommend artificial tears.

- Measurement of BLACK LINE (MLMI)
- Evaluation of the integrity of cornea and ascertaining the presence of corneal scars and bruises.

The product is already ready for the connection to Digital Imaging and Communications in Medicine (DICOM)

- Blue and white Led
- A thick grid to observe the quality of the tear film and measure the N.I.B.U.T.
- A fine grid to evaluate the quality and the structure of tear
- A Placido's disc to highlight possible distortions or corneal irregularities
- A yellow and cobalt blue filter via software for applicative evaluation of rigid contact lenses.





N.I.B.U.T or B.U.T.  
(with the use of fluorescein)



Interpretation and explanation to the patient



Graphic pre and post treatment with easy interpretation for the patient



All Dry Eye with scales and classified parameters on basis of standard

## Analysis lipid layer

Through a quick and easy acquisition of a series of 3 blinks, ICP Tearscope allows to obtain the thickness of the single Lipid Layer of the tear film classifying it in 7 different categories in a quick and precise way the secretion of the lipids by the Meibomian Glands.

Presence of grading scale and comparison in the time for detailed and precise follow up

For a detailed analysis of the mucin layer, ICP Tearscope evaluates in both modes the break up time of the lipid layer and, so, the stability through the classic TBUT with possibilities of use of fluorescein in blue light the non-invasive and quick N.I.B.U.T.

## Tear meniscus height measurement

The tear film is the thin layer of liquid (about  $8\ \mu$ , its thickness is variable on basis the considered portion and it results at maximum at cornea level) composed 98% of water and for the remaining 2% by protein and lipids, that is continuously and uniformly distributed on the ocular surface of the closing of the eyelids and that performs irreplaceable functions for our sight.

In fact it is able to improve the optic quality of the image regularizing the corneal surface (it has an index of refraction of 1,33, very close to that of the cornea); it allows an adequate lubrication reducing the friction of the eyelids, it allows the transport and the diffusion of molecules (oxygen, carbon dioxide, ions, mucins, lipids with a slightly alkaline pH 7,3/7,8), vital elements for the survival of the epithelia and of the cornea, it has strong antibacterial activity thanks to the presence of some enzymes and it guarantees the parts and keeps the ocular surface clean removing impurities from the environment, the waste of metabolism and exfoliated cells.

In the photos (on the left) is possible to recognize the diffraction of light on the lipid layer, on the right is possible to see the meniscus composed by tear film between the edge of the eyelid and the cornea (normal if its height is included between 0.2-0.5 mm).





## I.C.P. OSA

### I.C.P. OSA

A full assessment of the ocular surface through a combination of tests for dry eye diagnosis, from tear break up time to the tear volume production test.

### MGD Analysis meibomian gland disease

Easily and efficiently integrates complex examination, such as meibography into the ophthalmological and optometric practices.

Dry Eye is most commonly caused by the Meibomian Gland Dysfunction (MGD). The Meibo-Scan shows the morphological changes in the glandular tissue.

System analysis of the images obtained through a sensitive infrared camera (NIR) in order to locate in a guided way:

- The position detected from the image, valid both for the superior both for the inferior part of the eye
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- Loss between 75 and 100% in red
- Through the editor system is possible to modify the brightness of the picture for a better evaluation.

### Integrated system for the analysis of the ocular surface

The instrument is fit in the slit lamp tonometer's hall, it is designed to make all the related tear film tests, from the quality of the same to the analysis of Meibomian glands, as well as various measurements and classifications according to international grading scales.



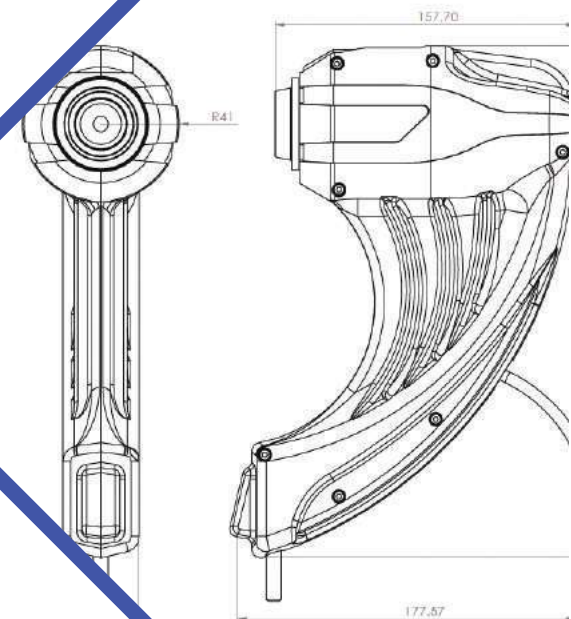


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### TECHNICAL SPECIFICATIONS

<b>IMAGE RESOLUTION</b>	5 mp
<b>ACQUISITION MODE</b>	Multi shot, tube, movie
<b>FOCUS</b>	Autofocus, manual focus
<b>ISO MANAGEMENT</b>	Variable
<b>GRIDS</b>	Placido disc, NIBUT grid
<b>CAMERA</b>	Coloured, sensitive to infrared (NIR)
<b>LIGHT SOURCE</b>	Infrared LED - Blue and white Led



Analysis of the break up time of the lipid layer not invasive without of installation of fluorescein



Analysis stability and calculation of the lipid layer thickness



Analysis meniscus tear with calculation of automated heights and parameters

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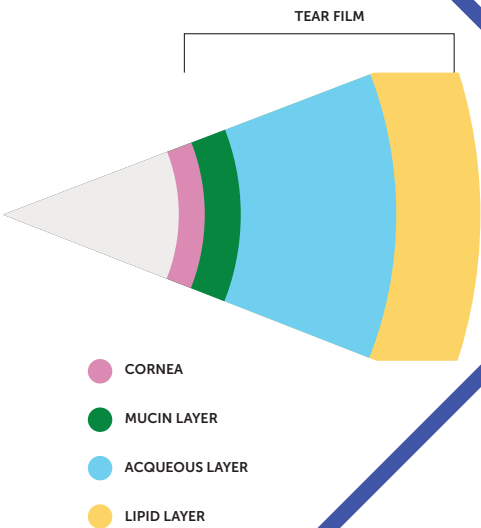
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N.I.B.U.T or B.U.T.  
(with the use of fluorescein)



Interpretation and explanation to the patient



Graphic pre and post treatment with easy interpretation for the patient



All Dry Eye with scales and classified parameters on basis of standard

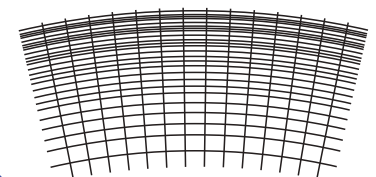
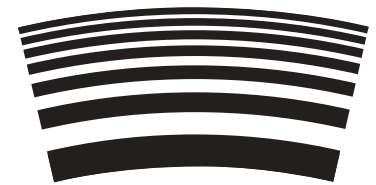
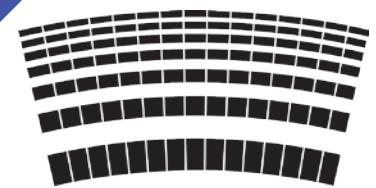
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- Blue and white Led
- A thick grid to observe the quality of the tear film and measure the N.I.B.U.T.
- A fine grid to evaluate the quality and the structure of tear
- A Placido's disc to highlight possible distortions or corneal irregularities
- A yellow and cobalt blue filter via software for applicative evaluation of rigid contact lenses.







### Tear meniscus-height

Evaluation of the tear film quantity.

With a various magnification tools, you can measure the tear meniscus height and evaluate its characteristics along the lower lid margin.

The tear film is the thin layer of liquid (about  $8\ \mu$ , its thickness is variable on basis the considered portion and it results at maximum at cornea level) composed 98% of water and for the remaining 2% by protein and lipids, that is continuously and uniformly distributed on the ocular surface of the closing of the eyelids and that performs irreplaceable functions for our sight.



### Palpebral angle measurement

Measurement of the nasal lower palpebral angle useful in the management of the contact lens.



### N.I.B.U.T.

Evaluation of tear film break-up time non invasive and fully automati. In the B U T test the presence of fluorescein in the tears may stimulate reflex tearing and may also result in changes to the tear film properties. To overcome these potential limitations, using a non-invasive procedure because the eye is not touched.



### MEASUREMENT

Mesopic, Scotopic, Photopic



Comparison Guillon scale



Benchmarking with Efron, CCLRU and Jenvis boards



### WHITE TO WHITE MEASUREMENT

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



### CORNEAL PLACID PLATE WARPAGE

subjective evaluation by the projection of palcido rings.





### Pupillometry

Measurement of the pupil reaction to light with and without glare.

Measurement mode:

- **SCOTOPIC**
- **MESOPIC**
- **PHOTOPIC**



### Lipid layer

#### **EVALUATION OF THE LIPID LAYER THICKNESS**

The color and structure of the lipid layer is visible and can be recorded. This shows the lipid layer thickness, which correlates with tear film evaporation and dry eye symptoms.



### Bulbar redness classification

Detected the fluidity of the blood vessels of the conjunctiva, evaluating the degree of redness, it will be possible to compare the classification sheets of the degree of redness of bulbar and limbal.



Comprehensive and easy to use report  
off all the examinations related to DED



Specific reports per exam



Complete management and fast  
registration data



#### **CORNEAL TOPOGRAPHER**

- Topography made through the placid rings placed in a non-invasive cone
- Rating with 4 different maps
- Possibility to simulate contact lenses
- Simple and assisted acquisition



#### **CONTACT LENSES APPLICATION SIMULATION WITHOUT FLUORESCEIN**

Ability to digitally test the CL application from database with simulation with fluorescein.





# DIGITAL SLIT LAMP

The new LED illumination systems on our slit lamps deliver our sharpest, brightest and most homogeneous slit ever. This ensures optimal diagnostic details from the cornea to the retina.

All filter and slit controls are conveniently situated for ease of use and, as with the cross slide mechanism, have a silky smooth, effortless movement. The slit mechanism is a masterpiece of engineering in itself, affording faultless precision in both shape and movement.

## TECHNICAL DATA

<b>TYPOLGY</b>	Digital slit lamp
<b>IMAGE RESOLUTION</b>	8 Mpx
<b>ACQUISITION MODE</b>	Multi shot, tube
<b>FOCUS</b>	Autofocus, manual focus
<b>ISO MANAGEMENT</b>	Variable
<b>MAGNIFICATION</b>	8x to 24x magnification with change via software
<b>DISTANCE OF FOCUS</b>	+/- 30mm
<b>SLIT WIDTH</b>	Adjustable up to 4 mm
<b>FILTERS</b>	Red-free, cobalt blue filter, yellow
<b>LIGHTING</b>	Led 5V - 6 Watts corresponding to 30 W halogen
<b>INTENSITY OF ILLUMINATION</b>	Adjustable from 0 to 100%

Invented and developed 100% in Italy

Medical instrument in CLASS I registered to the Ministry of Health

Medical electrical equipment CLASS I complies with the norm En. 60601-1.

The technical features of the instrument and its accessories can be improved in any time and without notice.

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I.C.P. Slit Lamp is an innovative system of images acquisition of the entire anterior segment that consists in the use of a cover technology for iPad equipped with a variable lighting body with slit opening from 0,1mm to 4mm.



I.C.P. Slit Lamp is the unique portable slit lamp with 12MP camera for the acquisition of video and images always clear and on focus, thanks to the simple use of the autofocus mode, it in fact make possible a focusing range more practical and profound of the classical fixed focus.



The instrument with the software, available on App Store, allows a very simple results interpretation and it is a convenient platform focused on the patient's education through the international scales of EFRON, CCLRU and Jenvis and a simple and guided follow up.



I.C.P. slit lamp is the new concept of digital instrument with the high performance and quality made in Italy.

The software contains a complete section of patient management with Database of related photos, images and exams.



The system is provided of DICOM communication and is available a Windows software for a simple data extraction on your PC.





# FERNING TEST

## ICP Dry eye analysis

The test reflects the conditions of the mucus and indirectly provides guidance on the osmolarity of tears. It is obtained atraumatically with a micropipette, without anesthesia, it is placed on a glass slide and allowed to dry at room temperature (20-22°C). The preparation is observed under phase contrast microscope 40-100 final magnifications. The test is based on a characteristic common to all mucous secretions, that is their capacity to crystallize in the form of ferns, when dried, because of evaporation.

The ferning test is an indirect qualitative index of the stability of the tear film with whom it is possible to evaluate the balance between the mucoproteins and the salts dissolved in the tears. A drop of tears is dried on a glass slide at room temperature.

The classification of the tears sample is made with Rolando in 4 different degrees: 1° degree: it indicates a ferning distributed evenly on the whole dried drop; it is detectable in the 52% of subjects. 2° degree: it indicates crystallization with small gaps (defects); it is detectable in the 31% of subjects. 3° degree: it indicates a ferning with big defects; it is present in the 15% of subjects. 4° degree: it indicates a dried drop with scattered granules but without ferning, or with a hint of ferning; it is present in the 1% of subjects.

The 1° and the 2° degrees are present in the great majority of normal subjects, while in the 3° and the 4° degrees it is found more frequently in patients with dried keratoconjunctivitis. The problem of this test is that the classification can result difficult for the inexperienced because it must occur for comparison with reference patterns and so it will be necessary more detailed cytological knowledge. Furthermore, if the dehydration is too fast, the ferns are altered and it is necessary to pay attention during the sample collection in order to not cause abrasions of the conjunctival mucosa with the tip of the suction pipette.

However, it is a test that, if made with others, can help to identify the subjects with alteration of the mucin layer that can be found for example in hypovitaminosis A, keratoconjunctivitis, chemical trauma and topical medications.

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## Ferning classification

Type I: contiguous ferning denoting a good protein carpet due to dense branching, in this case we know that in the film there is a fair amount of protein and that all parameters are respected, then we can safely apply all kinds of polymer.

Type II: The ferning is still abundant, but they begin to highlight gaps between the branches. The stability of the film is decreased, but we still have a good range of application for all types of lenses.

The sampling takes place via a microsyringe with a tube of rubber at the level of the conjunctiva, and not in the bulb; with a quick movement to prevent subsequent tearing.

The removal of the tear would distort the test.

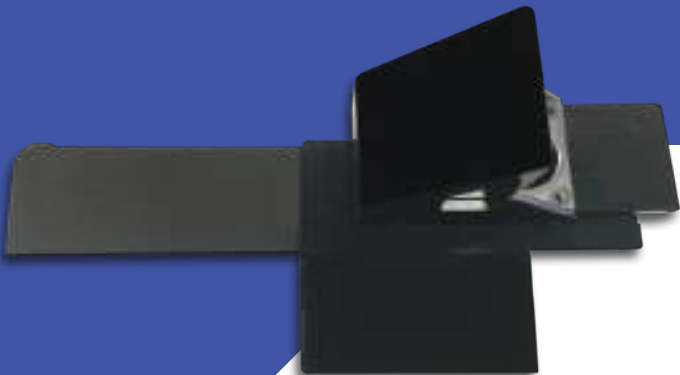
Type III: the ferning due to proteins and to precipitate salts begins to thin; appear blanks and uniform conglomerates mucin. For the application of lac, the film must be partially reinstated, in case of hydrophilic polymer must be rehydrated. For contact lenses Extended wear using artificial tears.

Type IV: the ferning phenomenon is absent and the sampled material does not show any organization, we see clusters and filaments of degenerated substances and possibly exfoliated cells. In this case there are no directions for the application of lac.





# PUPILLARY PARAMETERS DETECTION



## Oculoplastic surgery

The oculoplastic surgery specializes in the treatment of eyelids pathologies, the portion of the face around the eyes, the tear system and the orbits (deep structures that surrounding the eye).

The oculoplastic surgeons are Doctors Ophthalmologists that made a specific surgical training for this discipline, they have a depth knowledge of the eyelids, of the eye and of all orbital structures.

In addition they also have neuro-ophthalmologic knowledge that allow to manage the diseases to the border between neurology and ophthalmology.

Surgery is concerned with abnormalities of the eyelids or of the surrounding tissues, like the position and profile anomalies (for example eyelid ptosis or descent of the eyelids), of the distiroidea pathology (Basedow), of the eyes that weep as in the occlusion of the lacrimal streets, of the removal of cysts and tumors and of the installation and/or management of ocular prostheses.

- Visible horizontal iris diameter (HVID) that can be used to choose the total initial diameter of the trial lens
- The average and maximum diameter of the pupil that will affect the choice of BOZD.
- The vertical eyelid opening width (VPA), in both cases to support the choice of TD and also as basic initial measurement.

## IN CONDITION

- Mesopic (4 lux)
- Photopic (50 lux)

Demonstration of the lens in the eye diameter of the wearer with the various light conditions.

The product is already ready for the connection to Digital Imaging and Communications in Medicine (DICOM)

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### PUPIL DIAMETER

evaluation of the pupillary diameter directly on the patient's eye.



### MEASUREMENT WITH TOOLS



### IRIS DIAMETER

Evaluation of pupil size directly on the patient image



### WHITE TO WHITE MEASUREMENT

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

The function of the family Corneal Parameters Measurement is the typical one for this kind of devices:

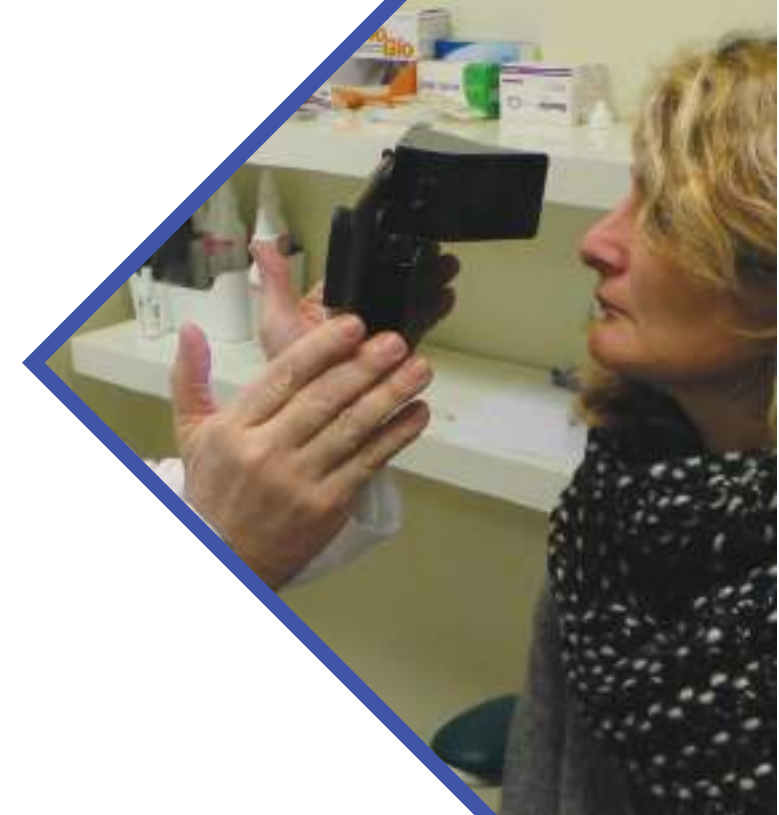
- The horizontal visible iris diameter (HVID) that can be used to choose the initial total diameter of the test lens.
- The average and maximum diameter of the pupil that will affect the choice of BOZD.
- The vertical palpebral amplitude (VPA) both to support the choice of TD as initial measurement of the base, as research indicates that the VPA can decrease with RGP lens wear.
- Eye observation and contact lenses positioning evaluation.
- The eye cyclotorsion

The devices are useful to the ophthalmologist or optician (within their respective professional skills) to perform specific diagnostic tests in ophthalmology (bio microscopic examination of the eye).

Mesopic conditions (4 Lux), photopic (50 Lux), Dynamics, starting from beyond 400 lux, turning off the light in order to dilate the pupil up to its maximum extent.

evaluation EXOFORIA

Accessories: white and blue LEDs







# IOL AXIS MARKING

## Axis calculation

Before the intervention of cataract removal it's necessary to measure different eye's parameters, in order to properly size the lens that will be implanted.

The eye torsion cycle of the patient evaluated standing can be different from the time when he is lying in the operating room.

The system provides images of the patient in proper axis on the grid.

The images will be acquired in the examination phase in different positions and used during surgery to help the surgeon.

The system provides the possibility to:

- Acquire monocular image of the patient, in any juncture with standing position
- Acquire monocular image of the patient, lying down

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Control of astigmatism's axis, screen grid, positioning and display cutting, ecc.



Inserting and evaluation with 4 landmarks



Calculation and visualization Ciclotorsion's value

All acquisitions occur with monitoring of the artificial horizon and the backup of tilt's data

Detection values nasal temporal axis and landmarks on each photo

Section results:

- Calculation and visualization Ciclotorsion's value
- Visualization values of iPad position during acquisitions
- Control of astigmatism's axis, screen grid, positioning and display cutting, ecc.
- Inserting and evaluation with 4 landmarks

## White to white

Automatic Tracking White To White corneal diameter

This system through gaussian filters, makes sharper the delineated contours and thanks to the integral-differential of Daugman, returns the edges.

The instrument is suitable for the use in the operating room.

The product is already ready for connection to the Digital Imaging and Communications in Medicine (DICOM)





# OPTICAL CHART

## THE PATIENTS SECTION ALLOWS THE MEMORIZATION OF THE PATIENT DATA WITH THEIR RESULTS

- LOG SEEDS
- LOG
- CROSS
- CLOCK
- NUMBERS
- CHILDREN
- ALBINI
- READ SPEED TEST 40 CM
- READ SPEED TEST WITH VARIABLE CONTRAST
- RED GREEN
- TEST FOR CLOSE 40 CM
- MESO/GLARE TEST
- COLOR VISION TEST LETTERS LARGE
- COLOR VISION TEST LARGE FIGURES
- COLOR VISION TEST SMALL LETTERS
- COLOR VISION TEST SMALL FIGURES
- S. CONTRAST LETTERS
- S. CONTRAST NUMBERS
- VARIOUS

The versatility of the remote control will allow the use of the application without to be close to the patient.

## An optotype in geometric progression with the following peculiarities

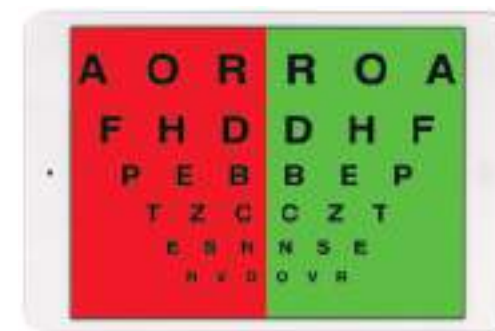
- Random presentation of images, numbers and letters
- Separated evaluation of the two eyes
- Contrast reversal
- For illiterate
- For children
- For simulators
- Read contrast
- Critical print Contrast



Various tests for visus are generated by an algorithm that, on the basis of the distance set, calculates the size of letters, the distance between the same and between individual rows.

For the other Optotypes, we visualize the single images chosen by catalogue that will be located and dimensioned based on the above criteria.

Read speed tests are characterized by a series of random sentences based on a distance of 40 cm.



Invented and developed 100% in Italy  
Medical instrument in CLASS I registered to the Ministry of Health  
Medical electrical equipment CLASS I complies with the norm En. 60601-1.  
The technical features of the instrument and its accessories can be improved in any time and without notice.  
To obtain an updated description we suggest to visit the website [www.sbmsistemi.com](http://www.sbmsistemi.com)

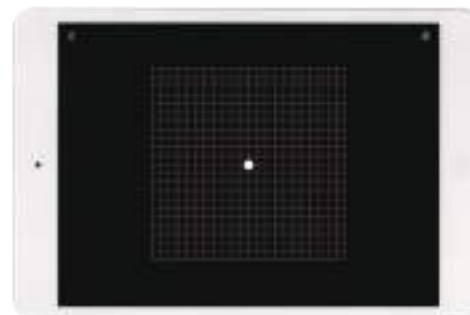
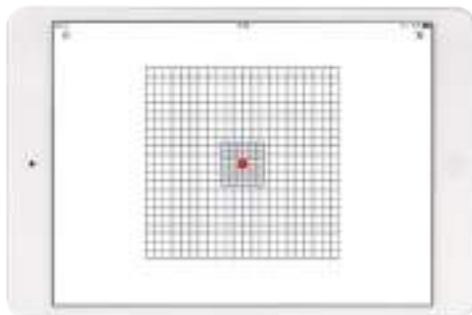
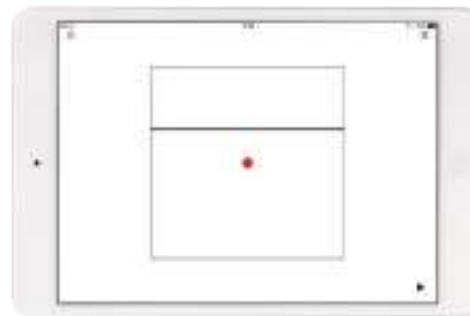
# AMSLER TEST

It is a very simple test that we can easily make at home at any time. The purpose of the test is to identify as early as possible the METAMORPHOPSIA that is the most typical symptom of the macular degeneration.

The metamorphopsia means the deformation, ripple, distortion of everything that is straight.

The grid is a diagnostic tool that helps to detect visual defects caused by retinal imperfections, optic nerve and transmission of visual impulses to the brain.

- STANDARD
- SCOTOMA COLOR
- HORIZONTAL METAMORPHOPSIA
- VERTICAL METAMORPHOPSIA
- CENTRAL
- HORIZONTAL MOVEMENT
- VERTICAL MOVEMENT





# ACCESSORY

**COMPLETE HOLDER FOR MGD**



**HOLDER FOR REFRACTION UNIT**

Usable on any slit lamp graft the tool support the analysis of meibomian glands, tearscope etc



**SLIT LAMP HOLDER**



# SPARE PARTS



## BRIEFCASE

Bags, resistant material to large stresses, have the particularity to be watertight with IP 67 impermeability and the perfect seal for liquids and dust, this is ensured by a rubber seal along the entire closure profile; is also present in all models a balancing valve of the internal and external pressure. Customizations are possible such as bespoke interior, screen prints or stickers.

<b>XL</b>	Dimension: 68x37x52 cm
<b>BIG</b>	Dimension: 52x41x25 cm
<b>MEDIUM</b>	Dimension: 42x29x16 cm
<b>SMALL</b>	Dimension: 34x30x15 cm

## TEAR SCOPE FILMS



## BATTERY

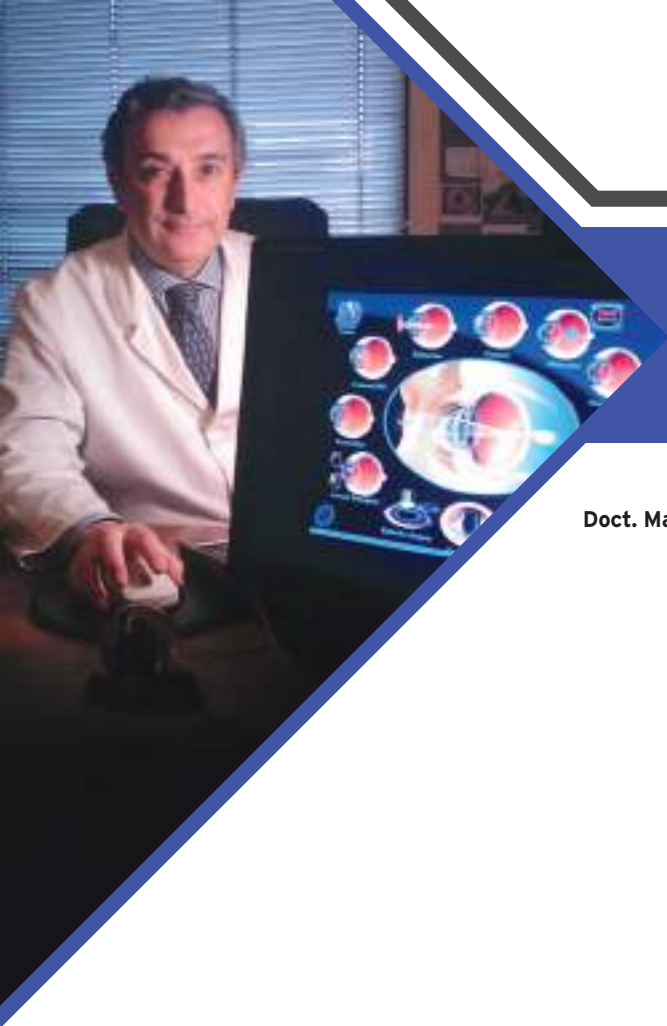


<b>POLYMER CELLS</b>	More thin and more light
<b>ULTRA-LIGHT</b>	It weighs only 72 grams
<b>INPUT</b>	5V DC 1000MA

<b>HOLDER</b>	Holder for 4 x AA type batteries
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## CLINICAL STUDIES

### **Doct. Mario Fagiano**

Born in Macerata on the 22/2/1952, resident in Piedmont since 1965

Graduation in classical studies with the highest school marks.

Graduated in Medicine and Surgery, with the highest school marks and e printing dignity at the University of Torino in October 1976.

Specialized in Ophthalmology, with the highest school marks and e printing dignity at the University of Torino in July 1980.

Registered at "l'ordine dei Medici of Turin".

Author of numerous studies published in international journals and of a textbook on corneal physiopathology and tear film.

He has been between the first surgeons in Italy to make, in 1978, still in the course of specialization, the intervention for the cataract through the "phacoemulsification".

He has been in the group of surgeons that have made the first interventions of vitreous surgery made to the Ophthalmic Hospital of Turin, in 1980.

He has been between the first surgeons of the Ophthalmic Hospital of Turin in 1981 to made implants of intraocular lens.

In 1981 he has been awarded from the University of Turin for his studies on corneal endothelium.

In 1982 he won the award "Fornaca" of the foundation "Pia Lobetti Bodoni" for his studies on the retinal diseases of surgical relevance.

He has been between the first surgeons in Italy in 1982 to make, with specialization at the Institute Fyodorov of Moscow, the incisional surgical of cornea.

He has held several courses in quality of supervisor on incisional corneal surgery.

He has been the first ophthalmologist surgeon in Europe, in 1996, to made interventions of conservative surgery of keratoconus through corneal implants.

He has about 28.000 interventions made on the anterior segment and on the posterior segment.

He is particularly interested in surgery of anterior segment and refractive surgery.

He worked for thirteen years at the department of pathology and retinal surgery to the Ophthalmic Hospital of Turin

Since 1981 freelance.

He directed for three years the Low Vision Center like owner-manager of the Piedmont region to the Hospital of Fossano (CN).

He has been responsible for four years of the ophthalmology division to the clinic "Promea" of Turin.

He has been responsible for three years of the ophthalmology division to the clinic "Sant'Anna" of Casale Monferrato (AL).

Since 2012 from today he is responsible of the ophthalmology division to the clinic "Istituto Raffaele Garofalo" of Verbania (VB)

Since 2015 he directs the Cataract Surgery Center with laser at femtoseconds of the clinic "Eremo di Miazzina" of Verbania (VB)



**Doct. Jean-Pierre Guillon**

B.Sc.Optom, London, Ph.D. Optometrist Jean-Pierre has a special interest in helping children with learning difficulties to see better. He also helps adults who have only recently been diagnosed with learning difficulties to improve their visual coordination and understand why they have had trouble for so many years. Jean-Pierre's strong research background means that the solutions he offers are proven to work.



**Universidade do Minho**  
Escola de Ciências

**Maria Madalena Cunha Faria Lira**  
**João Linhares**

**University of Minho, Physics Department**

The Minho University is a university established in Braga in 1973, with the rest of the so-called "New University" that have implemented the higher education system in Portugal.

Address: R. da Universidade, 4704-553 Braga, Portugal

Inscription: 18.330 (2015)

Foundation: 11/08/1973



# TESTIMONIALS



**Doct. Luca Vigo**

Is the Coordinator for general ophthalmology. He is mainly engaged in refractive surgery and cataract surgery.

## FORMATION

Doct. Luca Vigo is graduated with honors and praise at the State University of Milan, headquarters where he also received his specialization in Ophthalmology with 70/70 cum laude. In 1994 he made a stage at the University of California in Los Angeles (USA), and since then he deals with refractive surgery.



**Doct. Francesco Carones**

Is the Doctor in Charge of the Center. He is mainly engaged in refractive surgery and cataract surgery.

## FORMATION

Doct. Carones is graduated in Medicine and Surgery at the State University of Milan in 1988 with the 110/110 cum laude.

Specialized in Ophthalmology in 1992 at the same University with the 70/70 cum laude, he has focused immediately his professional interests on refractive surgery and cataract.

In 1992 he made a training at the University of Emory (Atlanta, USA) to acquire further knowledges in the field of refractive surgery.



**Doct. Massimo Gualdi**

1980 Ophthalmologist Specialist at "La Sapienza Roma" with 70/70 with honors.

1977/91 Assistant until he became Ophthalmologist Primary in the hospitals Villa Betania and San Camillo in Rome. He participated to more than 200 courses of national and international updates like Professor and/or supervisor. Over 500 congresses participating with monothematic courses, conferences, roundtables, live surgery. Diplomas and certificates deliveries at the most important schools of ophthalmology and institutes, like Bogota (Barraquer), Moscow (Fijodorov), Odessa - Texas (sheets), Baltimore (John Hopkins Stark), Las Vegas (Sinsky), Amsterdam (Bado), Nice (Crozaforon), Budapest (Nagy), ecc... Gold Medal for best young ophthalmologist of the Italian Society of Ophthalmology.

1982 Award of scientific photography in ophthalmology. Consultant Assistant Ophthalmologist at the hospital of Magliano Sabina (Rieti) USL RI 2.

1984 Consultant Ophthalmologist at the face Maxillofacial Surgery Department of S. Camillo di Roma.

1984 Certificate optometrist, optician, researcher investigator iridologist etc.

# BIBLIOGRAPHY

- Management and therapy of dry eye disease: report of the Management and Therapy Subcommittee of the International Dry Eye WorkShop (2007). *Ocul Surf.* 2007 Apr; 5(2): 163-78.
2. Paugh JR, Nguyen AL, Ketelson HA, Christensen MT, Meadows DL. Precorneal residence time of artificial tears measured in dry eye subjects. *Optom Vis Sci.* 2008 Aug;85(8):725-31.
3. Garrett Q, Simmons PA, Xu S, et al. Carboxymethylcellulose binds to human corneal epithelial cells and is a modulator of corneal epithelial wound healing. *Invest Ophthalmol Vis Sci.* 2007;48:1559-67.
4. Garrett Q, Xu S, Simmons PA, et al. Carboxymethyl cellulose stimulates rabbit corneal epithelial wound healing. *Curr Eye Res.* 2008 Jul;33(7):567-73.
5. Zheng LL, Myung D, Yu CQ, Ta CN. Comparative In vitro Cytotoxicity of Artificial Tears. *JSM Ophthalmol* 2015;3(1):1026.
6. Diebold Y, Herreras JM, Callejo S, Argueso P, Calonge M. Carbomer-versus cellulose-based artificial-tear formulations: morphologic and toxicologic effects on a corneal cell line. *Cornea.* 1998 Jul;17(4):433-40.
7. Tong L, Petznick A, Lee S, Tan J. Choice of artificial tear formulation for patients with dry eye: where do we start? *Cornea.* 2012 Nov;31 Suppl 1:S32-6.
8. Berger JS, Head KR, Salmon TO. Comparison of two artificial tear formulations using aberrometry. *Clin Exp Optom.* 2009;92:206-211.
9. Ridder WH III, Lamotte JO, Ngo L, et al. Short-term effects of artificial tears on visual performance in normal subjects. *Optom Vis Sci.* 2005;82:370-377.
10. Baudouin C, et al. Role of hyperosmolarity in the pathogenesis and management of dry eye disease: proceedings of the OCEAN group meeting. *Ocul Surf.* 2013 Oct;11(4):246-58.
11. Hirata H, et al. Hyperosmolar Tears Induce Functional and Structural Alterations of Corneal Nerves: Electrophysiological and Anatomical Evidence Toward Neurotoxicity. *Invest Ophthalmol Vis Sci.* 2015 Dec;56(13):8125-40.
12. Mager WH, Siderius M. Novel insights into the osmotic stress response of yeast. *FEMS Yeast Res.* 2002 Aug;2(3):251-7.
13. Lievens C, Berdy G, Douglass D et al. Clinical Evaluation of a New Enhanced Viscosity Eye Drop for Moderate to Severe Dry Eye Disease: A Multicenter, Double-Masked, Randomized 30-Day Study. *AAO Annual Meeting*, Oct 7-10, 2015, New Orleans, LA, USA.
14. Miller KL, Walt JG, Mink DR, et al. Minimal clinically important difference for the ocular surface disease index. *Arch Ophthalmol.* 2010 Jan;128(1):94-101.
15. Roth H-W, Conway T, Hollander DA. Evaluation of carboxymethylcellulose 0.5%/ glycerin 0.9% and sodium hyaluronate 0.18% artificial tears in patients with mild to moderate dry eye. *Clin Optom.* 2011;3:73-78.
16. Deng R, et al. Osmoprotectants suppress the production and activity of matrix metalloproteinases induced by hyperosmolarity in primary human corneal epithelial cells. *Mol Vis.* 2014 Sep 12;20:1243-52.
17. Hua X, et al. Effects of L-carnitine, erythritol and betaine on pro-inflammatory markers in primary human corneal epithelial cells exposed to hyperosmotic stress. *Curr Eye Res.* 2015 Jul;40(7):657-67.
18. Hua X, et al. Protective Effects of L-Carnitine Against Oxidative Injury by Hyperosmolarity in Human Corneal Epithelial Cells. *Invest Ophthalmol Vis Sci.* 2015 Aug;56(9):5503-11.
19. P. A. Simmons, J.-E. Chang- Lin, Q. Chung, J. G. Vehige, D. Welty; Effect of Compatible Solutes on Transepithelial Electrical Resistance and Uptake in Primary Rabbit Corneal Epithelial Cell Layers Model. *Invest. Ophthalmol. Vis. Sci.* 2007;48(13):428.





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