# Dry eye diagnostic system

Platform for Comprehensive Ocular Surface Examination

Dry eye diagnosis/Anterior Segment Photography/Lens fitting/ Patient management/Telemedicine

Guided examination:providing a comprehensive report covering 7 dry eye diagnosis.
Non-invasive examination,Quantitative data.

Full-automatic Firefly digital module ,easy operation without parameter settings.
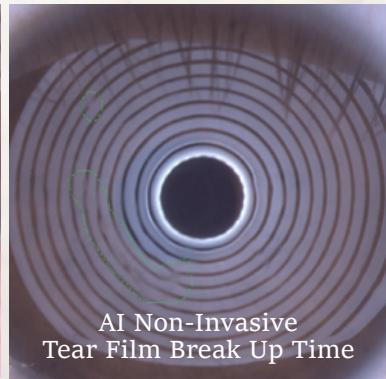High quality optics and built-in yellow filter efficiently increase the accuracy of lens fitting.

Professional 1/1.8-inch sensor and 2.4μm pixel,real-time playing and storage.
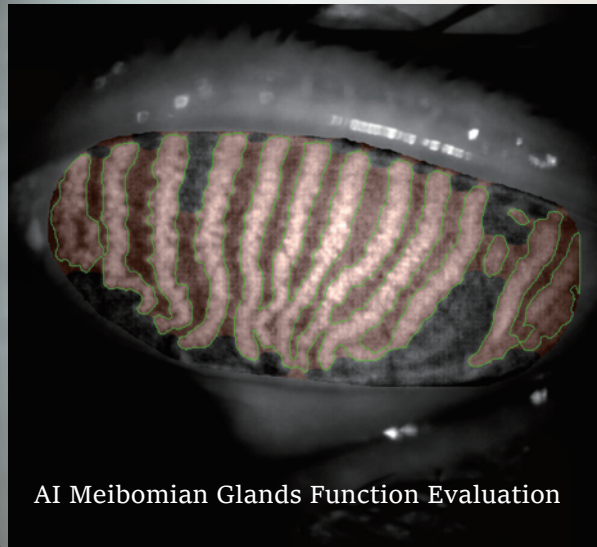Smart patient management system,DICOM supported.
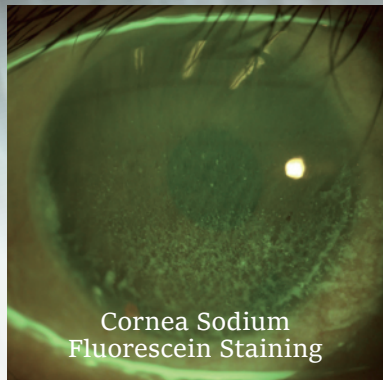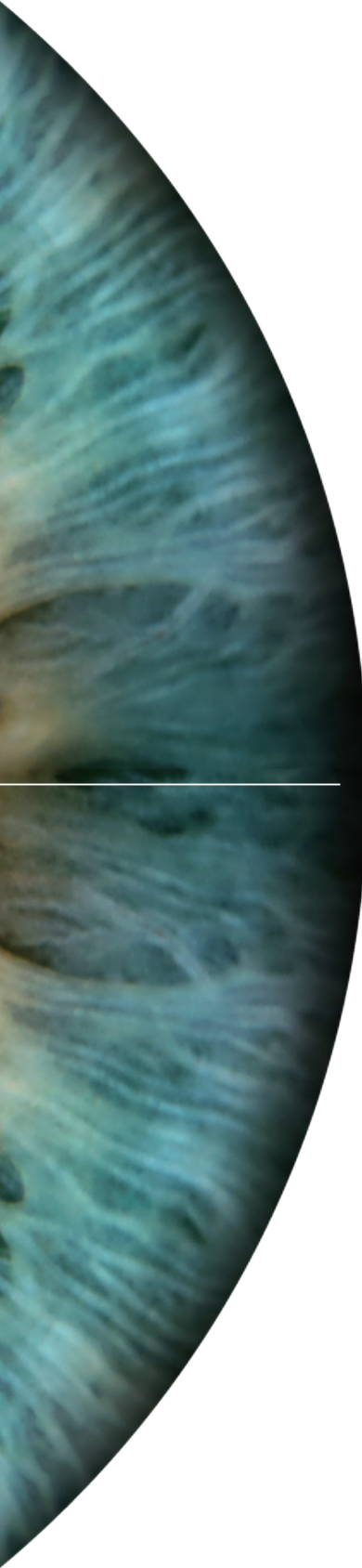
Cornea Sodium
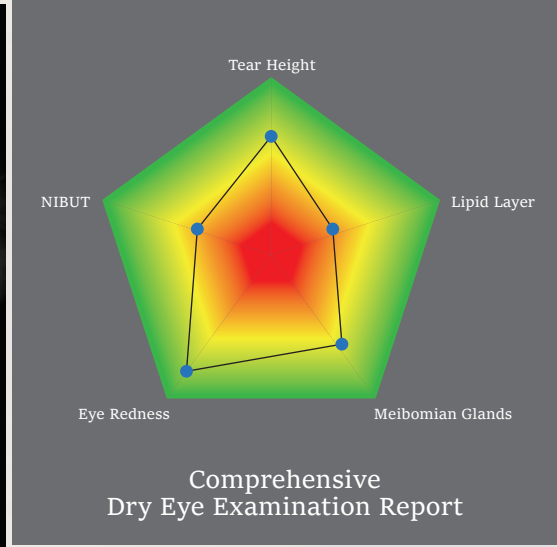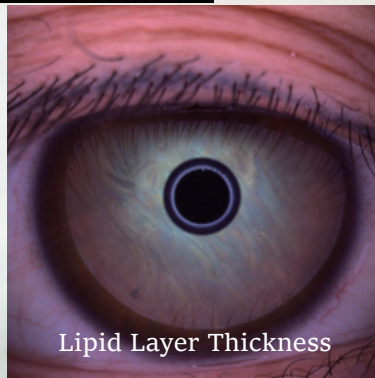Fluorescein Staining

AI Non-Invasive
Tear Meniscus Height

0.12mm

AI Non-Invasive
Tear Film Break Up Time

AI Meibomian Glands Function Evaluation

Comprehensive
Dry Eye Examination Report

Tear Height
Lipid Layer
Meibomian Glands
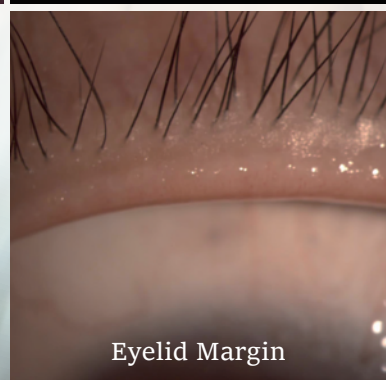Eye Redness
NIBUT

Lipid Layer Thickness
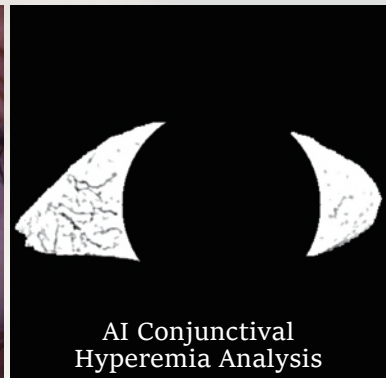
AI Conjunctival
Hyperemia Analysis

Eyelid Margin

Easy Pathogenic Diagnosis provides guidance for customized treatment.

Dry eye diagnostic system

AI Analyzing Meibomian Glands

Precise diagnosis of Dry Eye caused by MGD is guaranteed with the help of AI identification system.Unique Built-in infrared lighting system provides a larger scope capture of Meibomian Glands, adjustable depth of field and aperture enables more vivid images.

Increase positive rate of early corneal epithelial staining

Built-in yellow filter along with cobalt-blue filter increases the contrast of Sodium Fluorescein Staining image.

HD Optical System

Resolution is up to 200 lp/mm, providing more details of the pathologies.

Full Cornea Dry Eye Analysis

By Placido ring projection system with visible light,the examination scope is up to 8mm cornea diameter. Examination of the tear film outside of pupil center has the same significance for the diagnosis of Dry Eye.

Fully automatic Firefly digital module

Firefly Digital module is specially designed for anterior segment examination, no parameter settings required(automatic exposure,auto white balance,auto focus),with adjustable depth of field and wide dynamic range,5 Mega Pixels video output , high examination efficiency is allowed.

LINGLONG
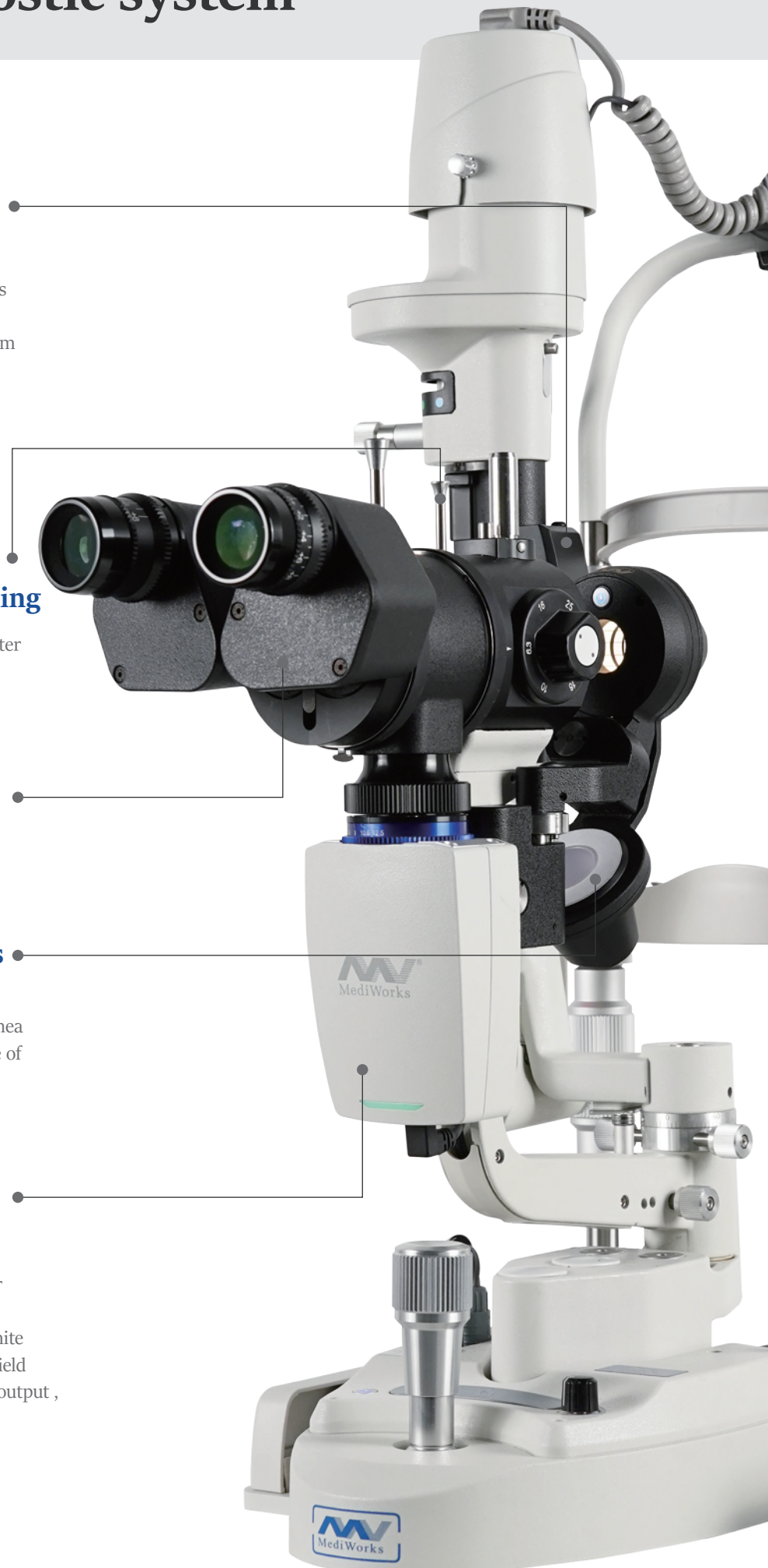
Due to various causes of Dry Eye Disease,traditional examination is difficult to find out the cause and quantify for the diagnosis. MediWorks Dry Eye Diagnostic System can provide standardized examination and quantified causes evaluation for Dry Eye Disease.

Tear film

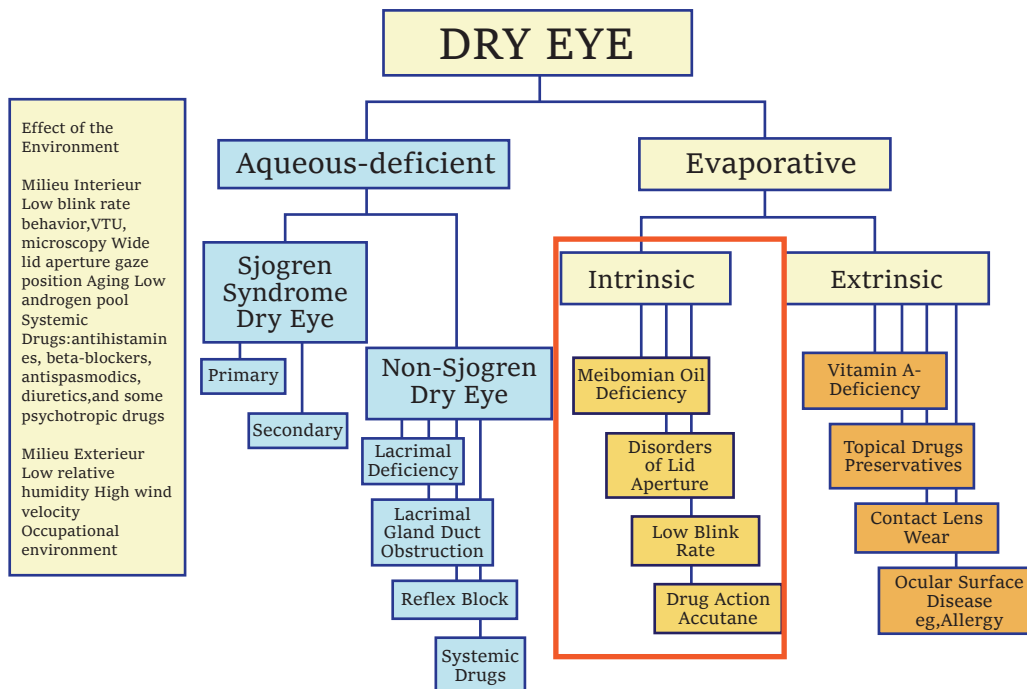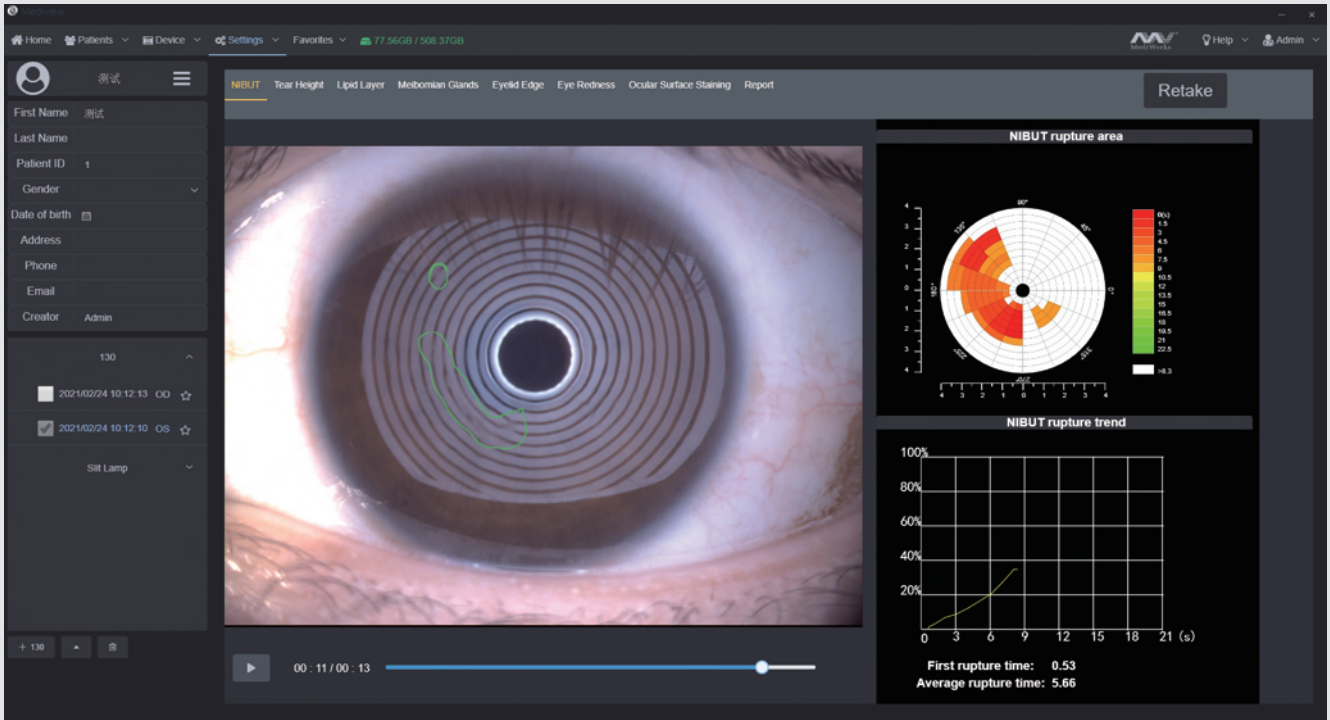| **Cornea**	**Mucous Layer**	**Aqueous Layer**	**Lipid layer**
	secreted by goblet cells fights off bacteria and adds stability to the tear film.	secreted by the lacrimal glands keeps the cornea hydrated and supplied with nutrients.	secreted by the meibomian glands prevents tear from evaporating and stop sebaceous lipids to enter the tear film.
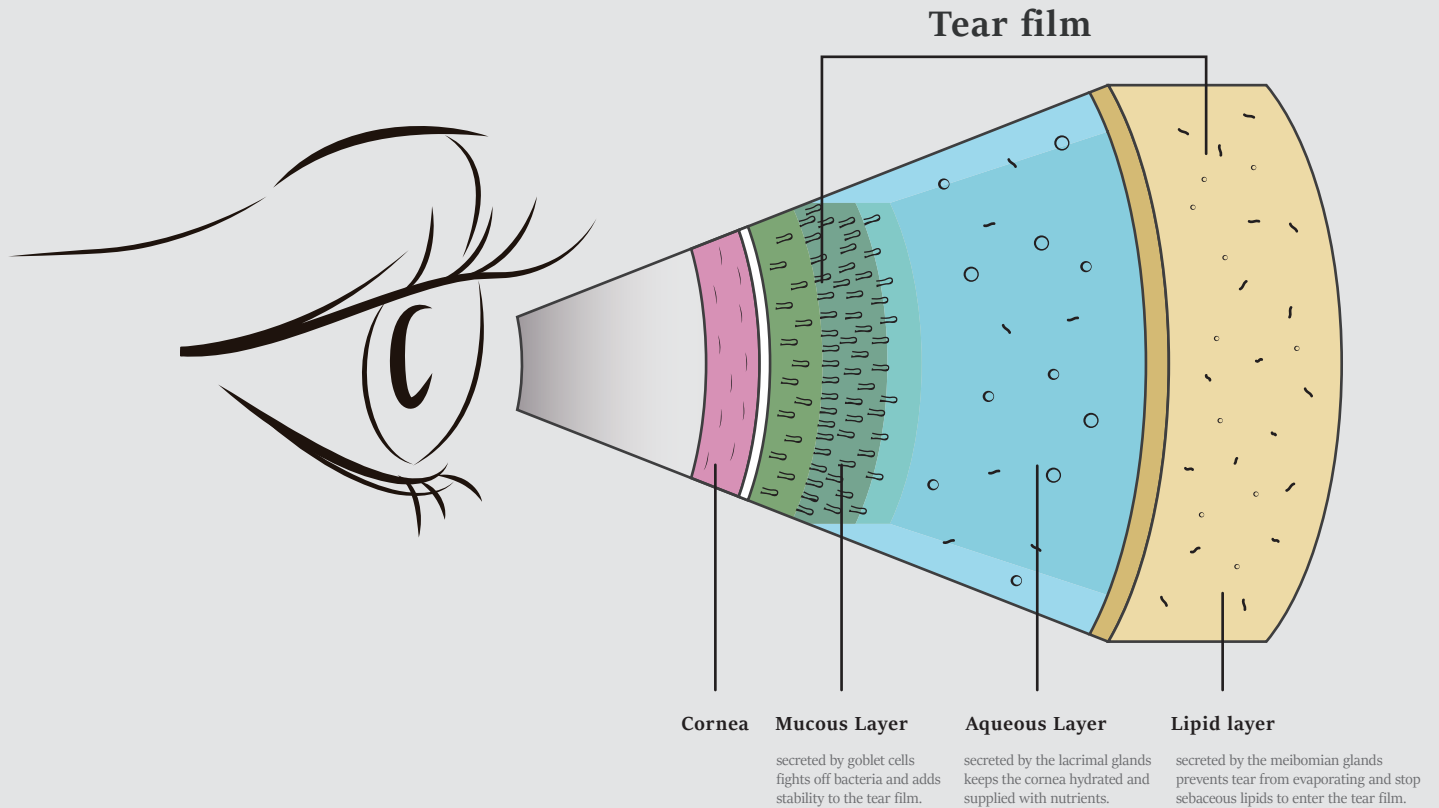
Dry eye classification from the 2007 DEWS Report

DRY EYE

Aqueous-deficient

Evaporative

Effect of the Environment

Milieu Interieur
Low blink rate behavior,VTU, microscopy Wide lid aperture gaze position Aging Low androgen pool Systemic Drugs:antihistamines, beta-blockers, antispasmodics, diuretics,and some psychotropic drugs

Milieu Exterieur
Low relative humidity High wind velocity Occupational environment

Sjogren Syndrome Dry Eye
- Primary
- Secondary

Non-Sjogren Dry Eye
- Lacrimal Deficiency
- Lacrimal Gland Duct Obstruction
- Reflex Block
- Systemic Drugs

Intrinsic
- Meibomian Oil Deficiency
- Disorders of Lid Aperture
- Low Blink Rate
- Drug Action Accutane

Extrinsic
- Vitamin A-Deficiency
- Topical Drugs Preservatives
- Contact Lens Wear
- Ocular Surface Disease eg,Allergy

AI Non-Invasive Break Up Time

After taking one video, it brings out automatis result of NIBUT and Tear Meniscus Height.

Grade 0 Normal, First Rupture Time: 10 s Average Rupture Time: 14 s
Grade 1 Warning, First Rupture Time: 6-9 s Average Rupture Time: 7-13 s
Grade 2 Dry eye, First Rupture Time: 5 s Average Rupture Time: 7 s

AI identifies the break-up area and analyzes NIBUT automatically. Fully automatic analysis system provides efficient quantified evaluation for the overall stability of tear film.It automatically acquires the first break up time, average break up time, break up distribution,break up area percentage curve and time distribution.

Visible light Placido ring projection

Infrared Placido ring projection
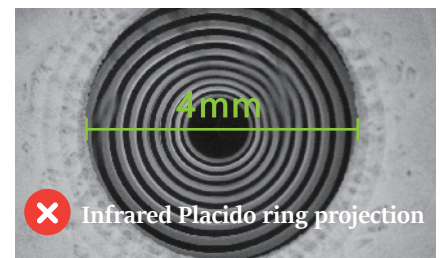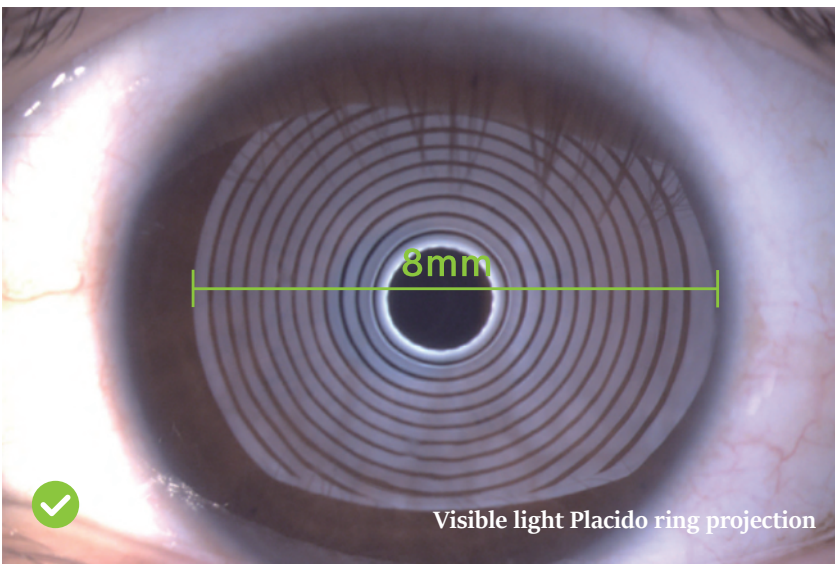
MediWorks adopts Placido ring projection system with visible light to do NIBUT examination,the examination scope is up to 8mm cornea diameter which brings much more comprehensive diagnosis outcome.
The non-invasive examination avoids the irritation brought by the traditional Cornea Sodium Fluorescein Staining.
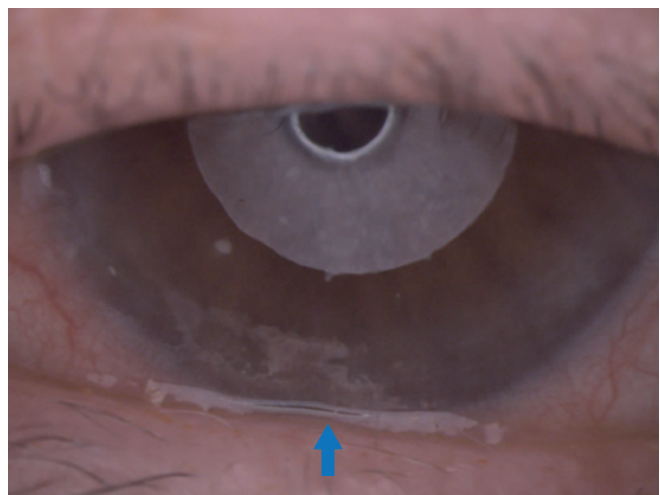
AI Non-Invasive Tear Meniscus Height
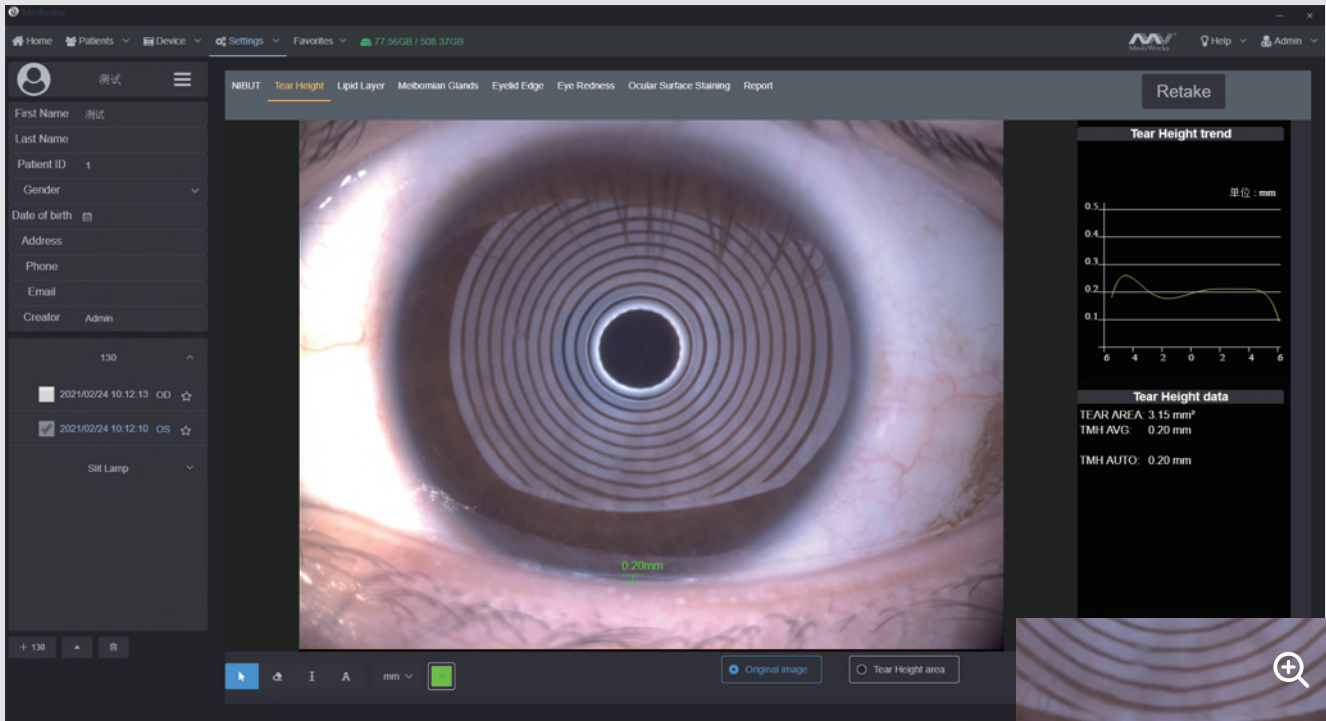
Normal: ≥0.2mm

AI identification system depicts Tear Meniscus area and measures the tear height automatically.

Evaluate tear secretion amount and continuity objectively.

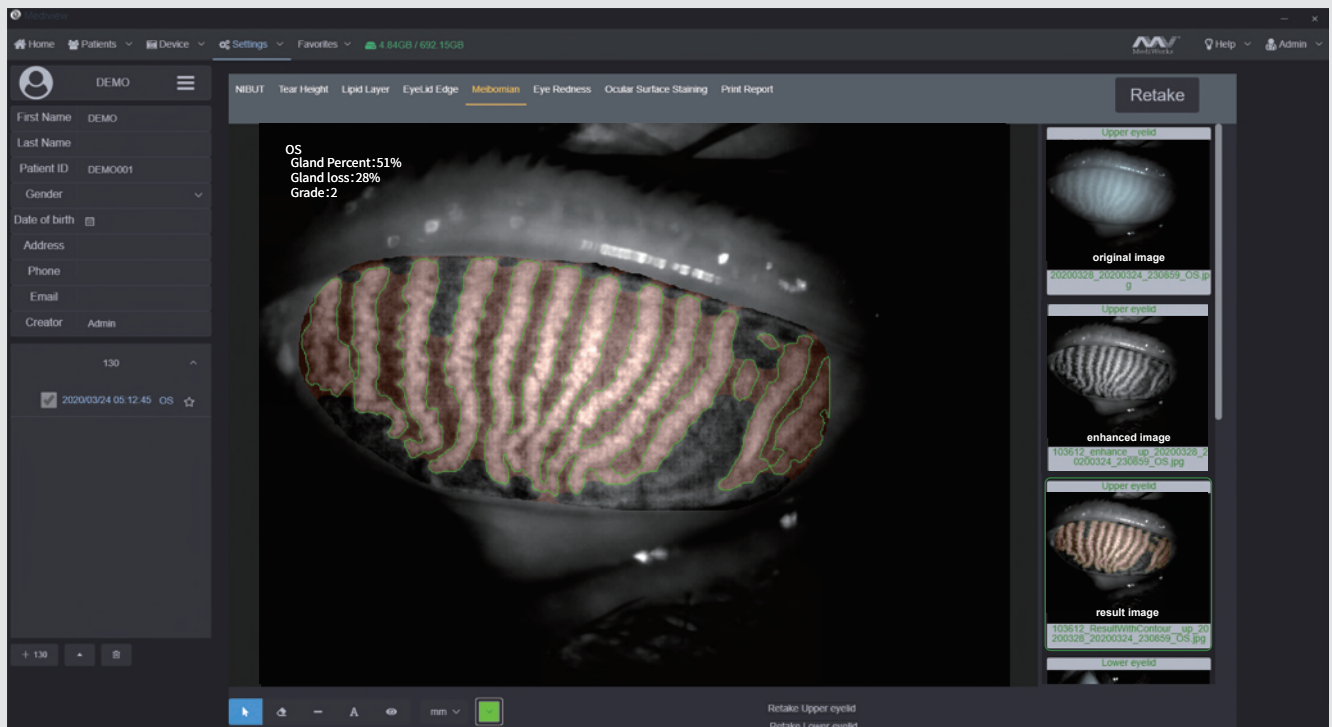More efficient and less irritation compared with the traditional Schirmer's test.
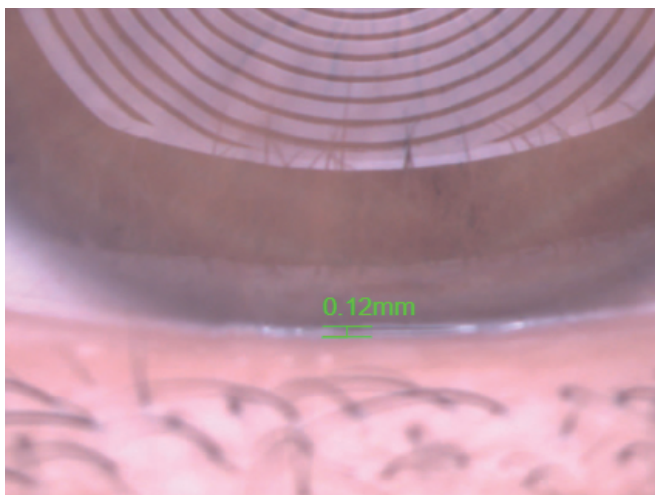
Insufficient tear secretion

Abnormal dynamics and conjunctival chalasis
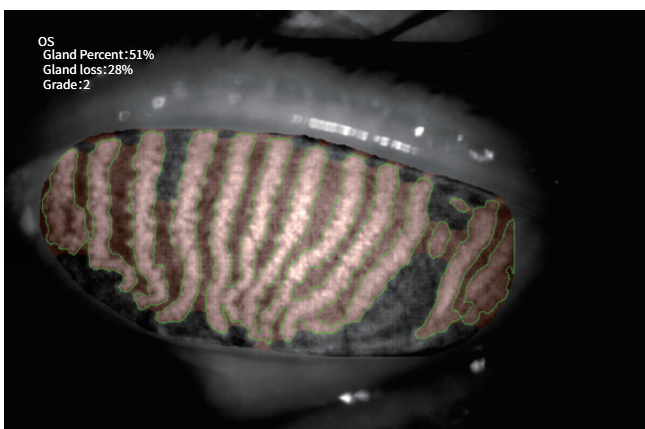
AI Meibomian Glands Function Evaluation

Get original/enhanced/result images by one click

Grade 0: No Meibomian Glands Loss
Grade 1: Meibomian Glands Loss < 1/3
Grade 2: Meibomian Glands Loss 1/3-2/3
Grade 3: Meibomian Glands Loss >2/3

AI identification system automatically anlalyzes meibomian glands loss caused by meibomian glands dysfunction with precise and quantified diagnosis results.

Built-in infrared lighting system helps doctors obtain larger image scope of the meibomian glands.

Adjustable depth of field makes the glands more prominent and distinguishable against the background.
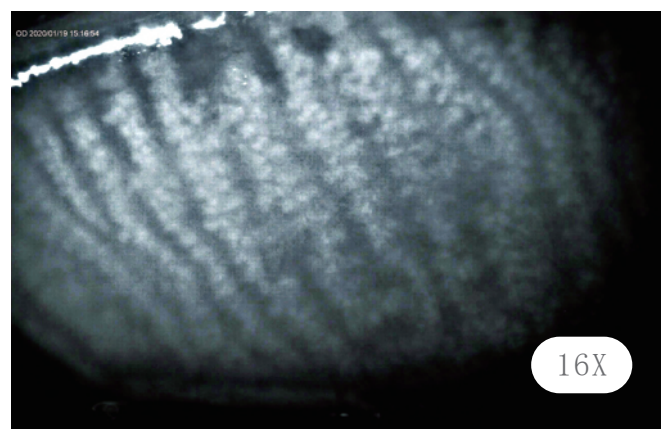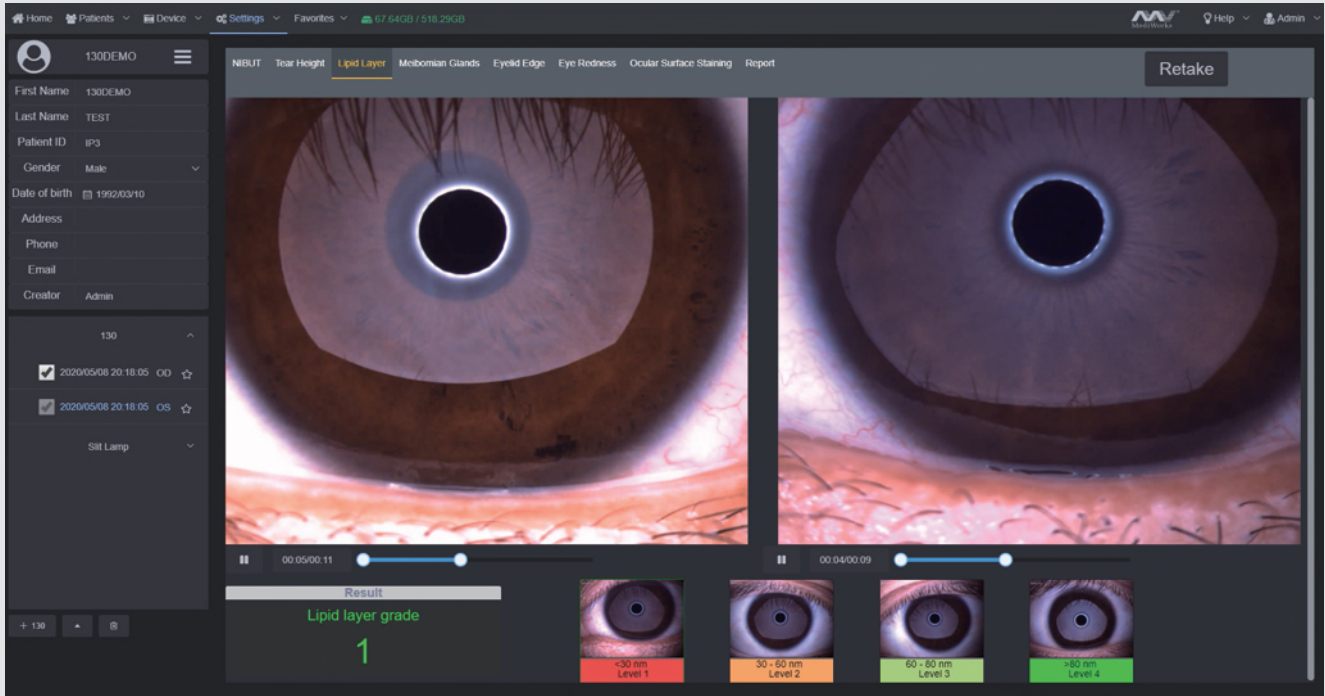

Meibomian glands loss

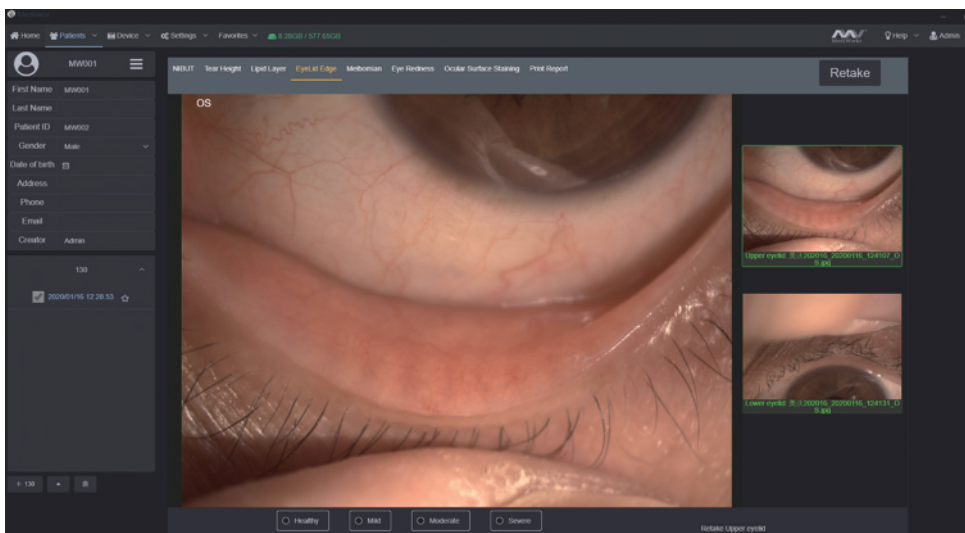**Image of Meibomian Glands under high-magnification**

Lipid Layer Thickness

White ring projection system ensures a larger examination area compared to Placido ring. By comparing with the standard grading template and recording the Lipid Layer thickness, it is helpful for judging MGD.

(Unit:nm)
Grade 1: <30
Grade 2: 30-60
Grade 3: 60-80
Grade 4: >80

Eyelid Margin

1. Normal including (Ophthalmic embolism bright, transparent)
2. Mild including (gland cap crown - glandular prominent)
3. Moderate including (glandular fat plug - disappearance of the marginal mucosa, hyperkeratosis)
4. Severe including (uneven margins, disappearance of the meibomian glands - posterior margin Blunt round, thickening, new blood)

Meibomian Glands obstruction

MediWorks professional design of optical system is capable of providing HD digital image that remains clear and sharp even zoom in, meets the examination requirements of the overall shape of eyelid margin and its slight change.
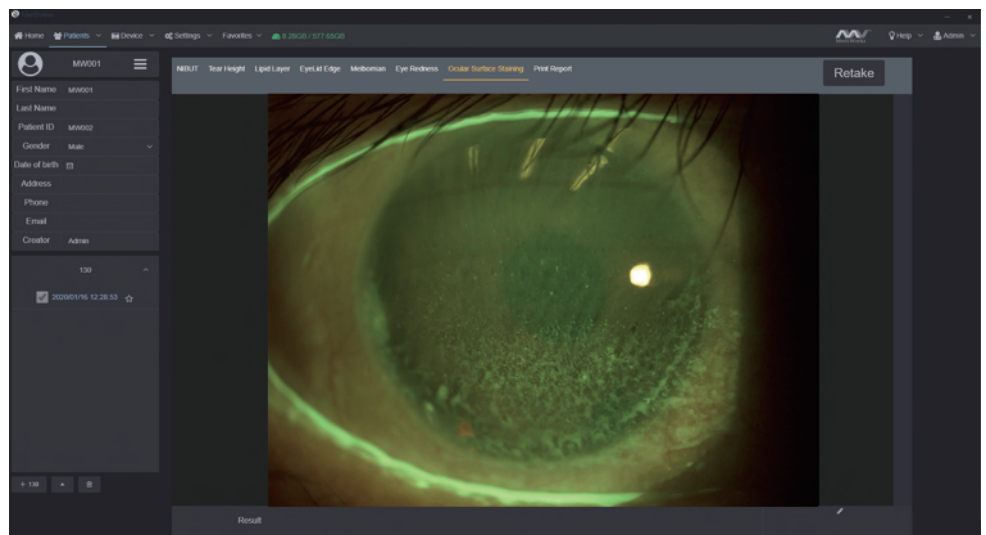
AI Analysis of Conjunctival Hyperemia
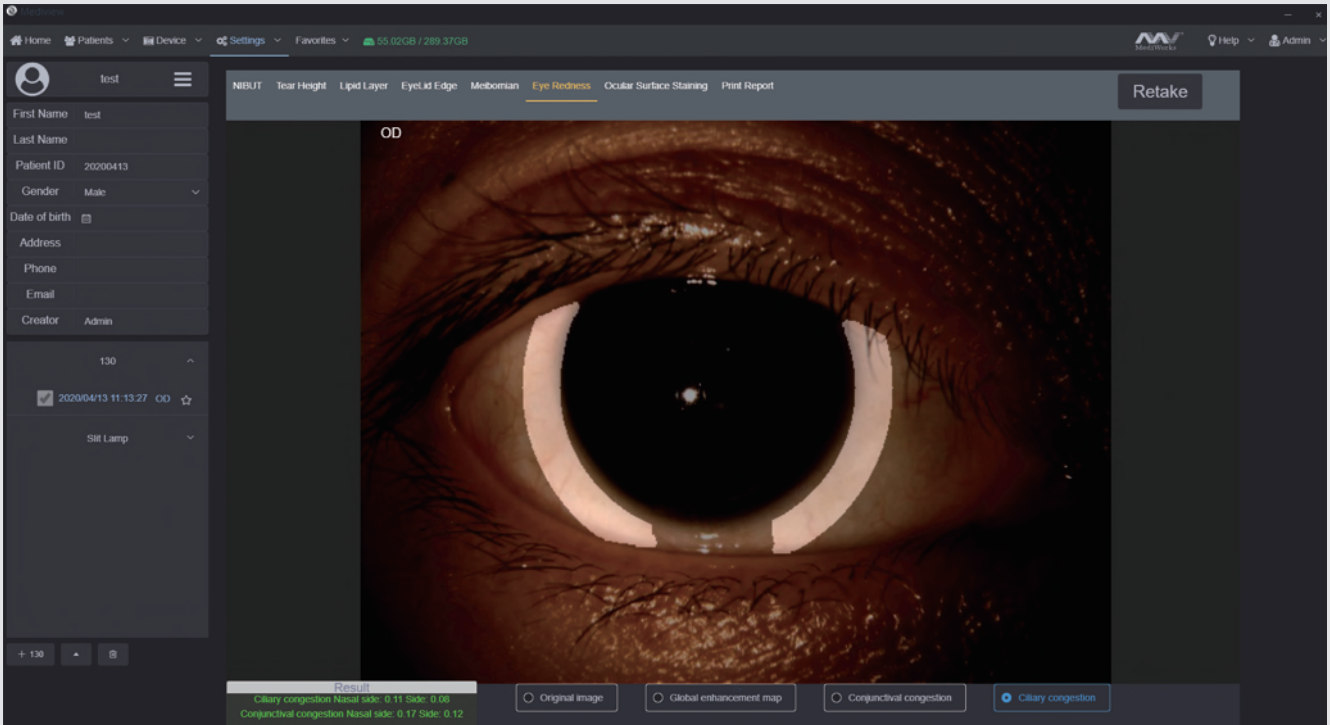
| Normal: ≤2 | Abnormal: >2 |

The unique AI identification system can identify and calculate percentages of conjunctival congestion and ciliary congestions and evaluate severity of eye congestion.

AI image

Cornea Sodium Fluorescein Staining

Without
Built-in yellow filter

Corneal epithelial staining
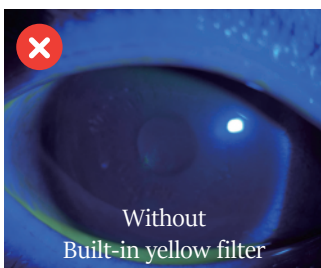
Effectively increases positive rate of early corneal epithelial staining.
Built-in yellow filter along with cobalt-blue filter makes the corneal sodium fluorescein images more clearly.

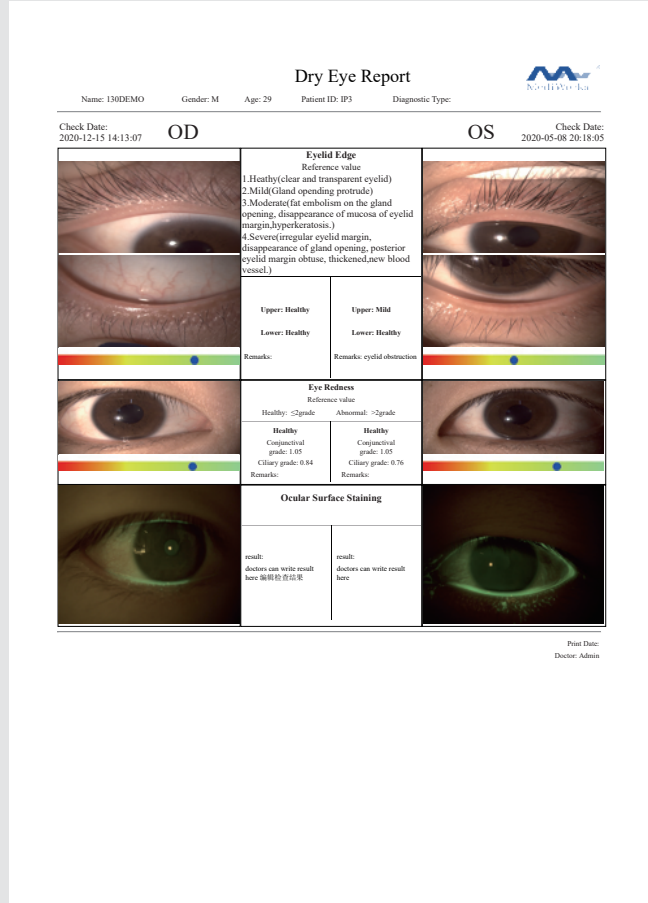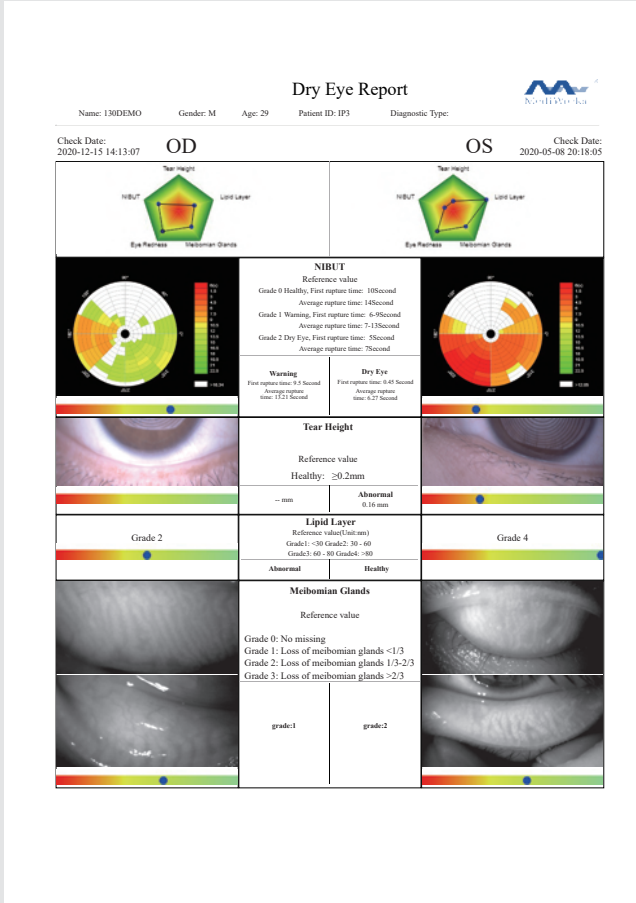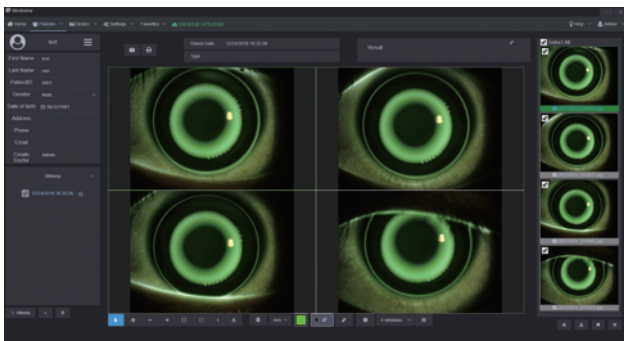# Dry Eye Comprehensive Evaluation Report

Smart Patient Management system

Comparison of Patient records
Supports repeated comparison among medical records to evaluate treatment and guide customized treatment plan.
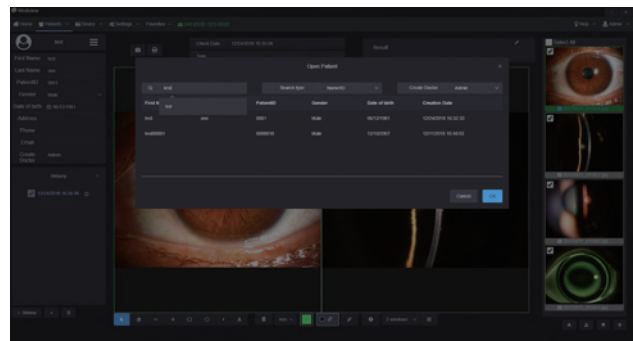
Patient Management system allows doctors to build and edit medical records. Quickly search the patient case by key words.Doctors can note patients' situation via the software. This DICOM-supported system enables Mediview to connect with medical systems in hospitals.

We are looking forward to your professional advice for our products and if you are interested in academic or business cooperation with us.

Please contact:
Email: International@mediworks.biz
Marketing@mediworks.biz

Specifications

Microscope

Microscope Type	Galilean Type
Magnification Change	Revolving Drum 5 steps
Total Magnification	6.3X, 10X, 16X, 25X, 40X
Optical Resolution	2700·N lp/mm （200 lp/mm）
Eyepieces	12.5X
Angle between Eyepieces	10°
Pupillary Adjustment	52mm-80mm
Diopter Adjustment	-8D~+8D
Field of View	Ø36.2mm, Ø22.3mm, Ø14mm, Ø8.9mm, Ø5.7mm

Slit Illumination

Slit Width	0~14mm continuous (slit becomes a circle at 14mm)
Slit Length	1~14mm continuous
Aperture Diameters	Ø14mm, Ø10mm, Ø5mm, Ø3mm, Ø2mm, Ø1mm, Ø0.2mm
Slit Angle	0°~180°
Slit Inclination	5°, 10°, 15°, 20°
Filters	Heat-absorbing filter, ND filter, Red-free filter, Cobalt blue filter, Built-in yellow filter
Lamp	LED
Luminance	≥150klx

Power Supply / Packaging

Input Voltage	～100V-240V	Dimension	740mm x 450mm x 530mm(L/W/H)
Input Frequency	50Hz/60Hz	Gross weight	23kg
Rated current	1.2A	Net weight	17kg
Output Voltage	LED 3V，Fixation 15V		

System Specifications

Digital Module	Automatic exposure/ Automatic white balance / Adjustable depth of field and aperture
Image Sensor	1/1.8-inch sensor / 2.4µm pixel / 5.0M Pixels
Photo Resolution	2592 x 1944
Format	JPEG
Video Resolution	2592 x 1944
Frame of Video	25fps
Video Formats	MP4 H.264
Exposure Mode	Automatic exposure
Transmission Interface	USB

Computer Specifications

PC configuration	i5-10500T 8G memory 25GB SSD+1TB storage
Display	1920×1080 23.8inch
PC system	Windows 10

Dry Eye Module

AI Non-Invasive Tear Break Up Time

AI identify the break-up area
Automatic first break up time
Automatic average break up time
Visible light Placido ring projection(23 ring)

AI Non-Invasive Tear Meniscus Height

AI identification system
Automatic Non-Invasive Tear Meniscus Height
Optical magnification
Electronic amplification

AI Conjunctival Hyperemia Analysis

AI identification system
Automatic conjunctival congestion percentages
Automatic ciliary congestions percentages

AI Meibomian Glands Function Evaluation

AI identify Meibomian glands
Automatic Meibomian glands loss classification

Lipid Layer Thickness

Template comparison evaluation
Visible light White ring projection system

Cornea Sodium Fluorescein Staining

Eye surface damage report
Built-in yellow filter
Cobalt blue filter

Eyelid Margin

Optical magnification
Electronic amplification

Dry Eye Examination Report

Automatic analysis report

Details Make the Difference