



Author: Dr Jennifer Rayner,  
Optometrist, BAppSc(Optom),  
GradCertOcTher(UNSW)  
Alleve Eye Clinic, Adelaide, Australia

# Using the OCULUS Keratograph 5M and JENVIS Pro Dry Eye Report to Diagnose Dry Eye

In a perfect world, patients would present with a single, obvious cause for their dry eye and management would be simple, quick and effective. Yet there are often multiple factors that contribute to the presence of dry eye and they need to be identified as contributors for best management. A tool such as the OCULUS Keratograph 5M with specific JENVIS Pro Dry Eye Report software allows for advanced testing to understand the subtleties and complex nature of the ocular surface and tear-film.

A 74-year-old female was referred by her ophthalmologist to our clinic with a 10-year history of extreme difficulty opening her eyes in the mornings as they “felt stuck together”, and gritty, sore and red eyes and eyelids throughout the day. She was under the care of her eye specialist for bilateral ocular hypertension (OH) diagnosed in 2008 and her current treatment was a preserved prostaglandin analogue at night in both eyes. Her dry eye symptoms were attributed to her OH eyedrops and current treatment was to use non-preserved single use carmellose sodium drops over a dozen times day, which offered little relief. Artificial gels at night blurred her vision and did not help. Oral supplements included calcium, glucosamine, vitamin C, zinc and garlic and her only other prescription medication was perindopril arginine 5mg/amlodipine 10mg to control her hypertension. She was diagnosed as gluten intolerant in 2005 and with rosacea in her 50s.

On presentation her TBUT was recorded as 1-2 seconds in each eye. There was no corneal staining noted in her right eye but moderate seen in her left – a misdirected eyelash was epilated and attributed to the corneal staining (see fig. 2). Mild madarosis with significant anterior blepharitis and lid margin telangiectasia was noted along all lid margins. Meibum was very inspissated in all glands. An in-rooms lid heating and expression was performed, and she was instructed to continue with daily 10-minute warm lid compresses at home. Due to the collarette appearance on the lashes and her history of rosacea, Demodex mites were attributed to be the cause of her anterior blepharitis and she was recommended to use a tea tree oil wipe at night time to repel their activity. She was also prescribed medical grade manuka honey eyedrops twice daily – an antibacterial and anti-inflammatory agent that is proving to be a useful tool in the treatment of dry eye and is not contra-indicated in the management of glaucoma and OH.

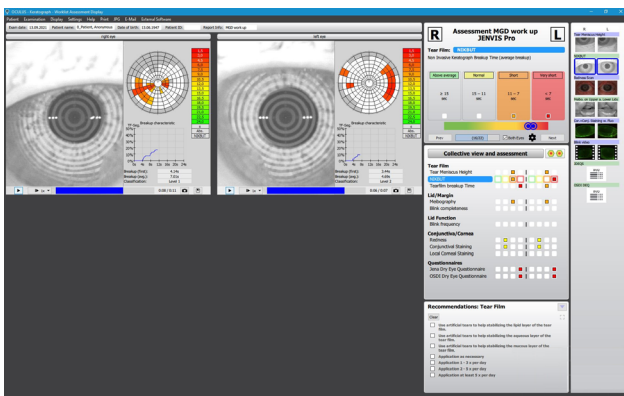


Figure 1: NIKBUS classification of right (NIKBUS<sub>first</sub> = 4,34s) and left (NIKBUS<sub>first</sub> = 3,44s) eye

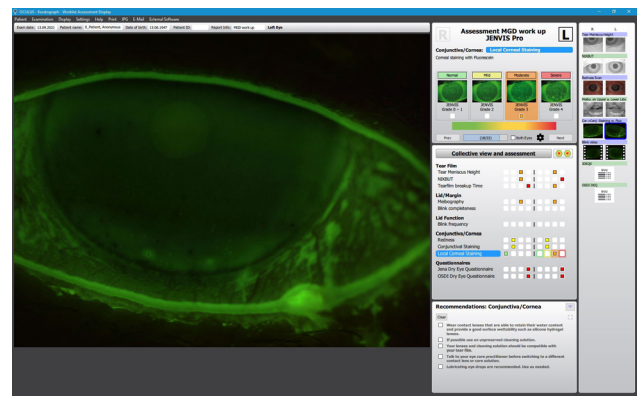


Figure 2: Moderate corneal staining left eye

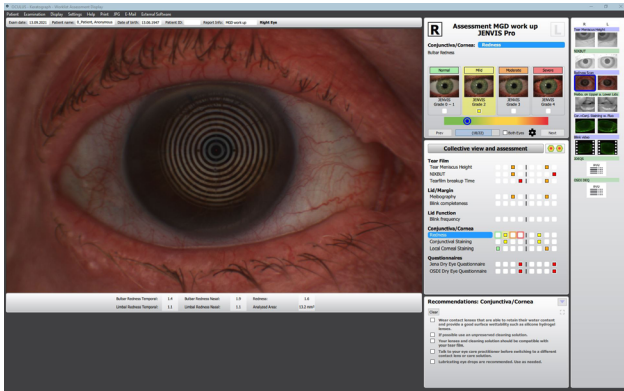


Figure 3: Bulbar redness classification and teleangiectasia in the right eye

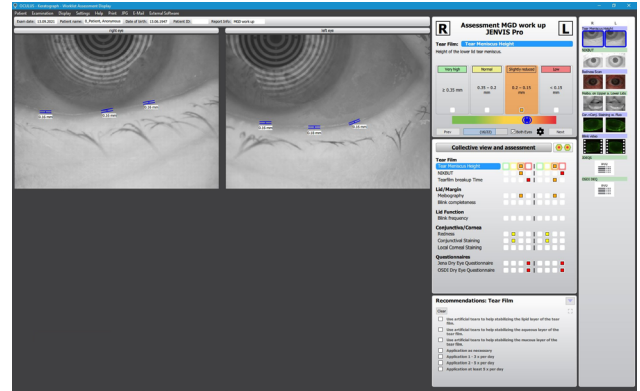


Figure 4: Tear meniscus height measurements and classification of both eyes

Imaging with the JENVIS Pro Dry Eye Report was not able to be done at the time of the initial consultation so treatment was commenced and testing was performed a fortnight later on review. There was a slightly reduced tear meniscus height (TMH) of 0.16 mm in each eye (see fig. 4). Her OSDI score was 81, indicating severe eye disease (normal 0-12, severe 33-100). The lashes were much clearer although collarettes could still be seen. Blinking was impaired in the left eye more than right (see fig. 5) and she was encouraged to do blink training as part of her management.

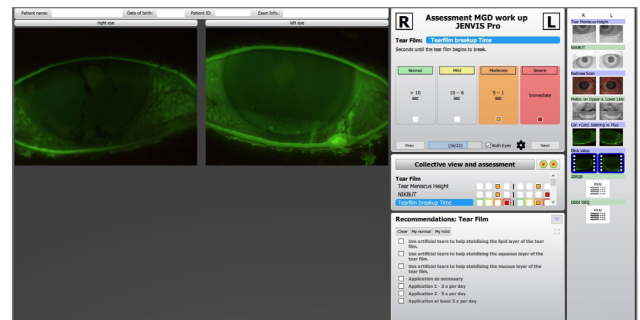


Figure 5: Blink quality in both eyes

### Follow Up

The patient was reviewed twice over the following 6 weeks with further in-rooms heat and lid expressions performed. The meibum quality slowly improved and she reported improvement in her symptoms on waking. Her persistent redness was still a concern for her, so the plan was to discuss with her ophthalmologist the use of a 3-6 months course of oral doxycycline 50 mg, to decrease the ocular rosacea and lid margin redness, and possibly a course of IPL.



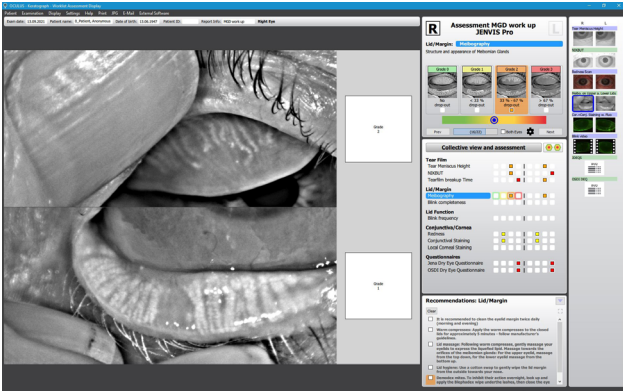


Figure 6: Meibomian gland assessment of upper and lower eye lid (right eye)

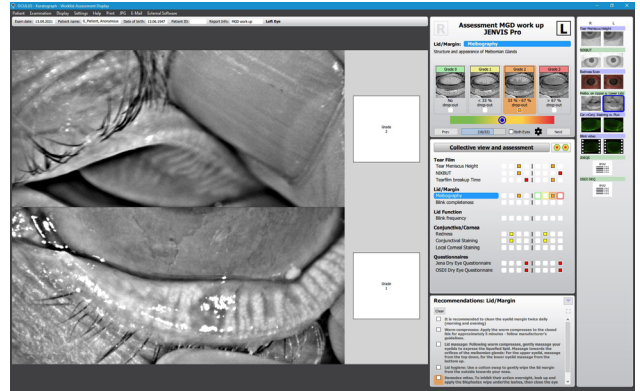


Figure 7: Meibomian gland assessment of upper and lower eye lid (left eye)

Discussion

On review, the observed TBUT of 3-4 seconds R&L was marginally better than her initial presentation and corresponded well with the objective NIKBUT (see fig. 1) of R 4.34, L 3.44 seconds. Looking at the meibography (fig. 6 and fig. 7), both upper lids were graded as 2 and lower lids as 1. This drop out explained the increased evaporation rate of the tear film, but also the chronic nature of the disease and the likelihood that the commencement of the OH medication was the perhaps the main cause of the meibum change and subsequent gland drop out over time. She recalled being prescribed ointment for ocular lubrication in the late 1990s and her history of rosacea suggests her predisposition for dry eye may have started many years before her first symptoms. While the TMH suggested a possible aqueous deficiency, in my experience, improved meibum quality with better tear retention usually results in increased TMH as well.

An oil-based non-preserved artificial tear was introduced to her regime during the day to supplement the tear film until it improved naturally, and redness imaging was to be done each subsequent visit to monitor the effectiveness of the doxycycline and our treatment regime (see fig. 3).

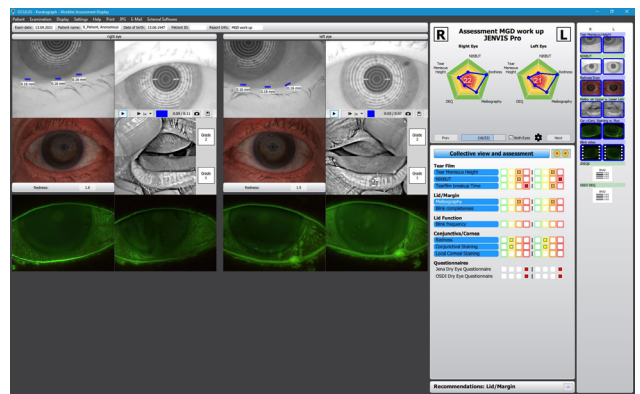


Figure 8: JENVIS Pro Dry Eye Report collective view and assessment of both eyes

Conclusion

This case study aims to demonstrate how data from the JENVIS Pro Dry Eye Report can be interpreted to form an individualised management plan for each patient based on their specific contributing factors. Aside from baseline diagnostics, the JENVIS Pro Dry Eye Report is an invaluable tool for ongoing quantitative and qualitative comparative data to measure improvement, for clinician (see fig. 8).

