

NEW TOOLS

for dry eye management



Figure 1: Taking a sample of tears with InflammaDry

Nick Atkins of Positive Impact introduces two new in-practice tools to improve the diagnosis, treatment and profitability of dry eye services

Dry eye: there seems to be no getting away from those two words these days, but before you despair about 'yet another dry eye article' – don't. Stick with it because this one is different, I promise. . . The reason? This article introduces two new products that can really make a difference; firstly to your diagnosis and then, more importantly, to the relief of your patients' symptoms. But that's not all. Equally importantly, it will show you how you can put practitioner skill and expertise back in control of patient care and, lest we forget, patient spend.

One of the perennial problems in the diagnosis of dry eye is that there is not one definitive test practitioners can do to quickly and easily identify it and, more importantly, discover its underlying cause. We use a whole gamut of tests that still often leave us thinking that it's probably dry eye but asking: "Is it really?" And if it is, "What is its cause?" In fact, despite advances in our understanding of this disease, patient symptomology via dry eye questionnaires is still one of the most reliable ways (without significant investment in technology) to understand the severity of the disease and then monitor any improvement resulting from our management strategy.

So let me introduce you to these two exciting new clinical and commercial opportunities for independent practice. . .

InflammaDry

InflammaDry is a new point-of-care diagnostic test (POCT) that enhances our understanding of the patient's dry eye with a simple pass or fail result. InflammaDry is the first and only POCT that detects Matrix metalloproteinase-9 (MMP-9), a biomarker for inflammation that is consistently elevated in the tears of patients with dry eye disease (Sambursky, 2013). It is a reliable and relatively low cost disposable test that is simple to use and gives a definitive result in just 10 minutes.

MMP-9

MMPs are proteolytic enzymes produced by the stressed ocular surface and by inflammatory/immune cells. MMP-9 has been found to play

an important role in wound healing and inflammation (McCollum, 1994). It is a non-specific marker for inflammation and, in conjunction with patient history and assessment of clinical signs, will help confirm a diagnosis of dry eye. As inflammation can long precede the clinical signs of dry eye (Sambursky, 2011), MMP-9 is a more sensitive diagnostic marker for dry eye than clinical signs alone (Chotikavanich, 2009). In fact, InflammaDry has a sensitivity of 85 per cent with 94 per cent specificity.

MMP-9 activity is significantly higher in patients with dry eye and increases as dry eye severity progresses (Chotikavanich, 2009). In a normal tear film, the level of MMP-9 is low at between 3-40ng/ml. Abnormal levels of MMP-9 (≥ 40 ng/ml) have been shown to correspond with moderate-to-severe dry eye disease, as defined by the Dry Eye Workshop (DEWS) Report (Ocular Surface, 2007, Chotikavanich, 2009).

Administering the test

The test comprises of three components: sample collector with sampling fleece, the testcassette and a vial of buffer solution. There are four simple steps to carrying out the test:

1. A sample of tears is taken by gently dabbing (NOT dragging) the sample fleece in multiple locations along the lower palpebral conjunctiva as shown in **Figure 1**.
2. The sample fleece is then clipped in place on the test cassette.
3. The absorbant tip on the test cassette is immersed in the buffer solution for about 20 seconds.
4. Finally, leave for a minimum of 10 minutes and read the test results.

In the result window, there will be a blue line to indicate that the test was carried out correctly and enough tear sample taken to be valid. If there is no other line present then the test result is negative. Should a red/pink line be visible alongside the blue line then the test is positive with MMP-9 levels ≥ 40 ng/ml (**Figure 2**).

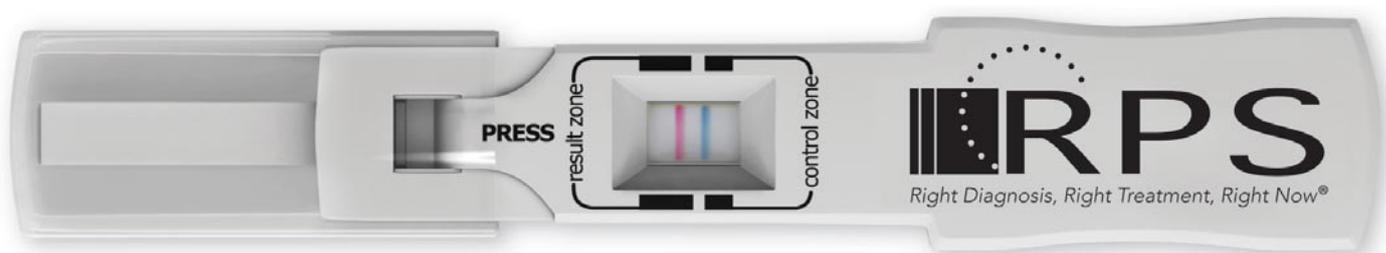


Figure 2: Showing the sample collector clipped into the test cassette with a positive result

There are three outcomes for a patient complaining of dry eye symptoms:

1. **The result is positive.** Treatment options would include referral (unless you're an IP optometrist), Omega-3 and artificial tears.
2. **The result is negative with an absence of any clinical signs.** In this case a course of artificial tears is appropriate.
3. **The result is negative but with other clinical signs.** If already using drops consider an alternative type with a different mode of action, lid hygiene, Omega 3 and/or punctal occlusion etc.

InflammaDry for contact lenses

Dryness is one of the main causes of contact lens dropout and it is also known that contact lenses cause ocular inflammation. Used prior to fitting contact lenses, InflammaDry can help avoid fitting patients who will likely suffer dry eye/discomfort, enabling their dry eye to be managed prior to a contact lens trial.

Punctal occlusion

An under-utilised tool in the optometric management of dry eye is the simple and relatively safe procedure of punctal occlusion. Whilst popular with both optometry and ophthalmology in the US, the technique is most likely to be carried out by ophthalmologists in the UK. As a consequence, it is the author's opinion that a large group of patients are not being optimally managed and are continuing to suffer symptoms unnecessarily.

Though dry eye symptoms can be significantly reduced with the use of artificial tears of varying formulations and viscosity, patients can feel burdened with the frequent use of such aqueous tear enhancers. This, and the difficulty some patients have instilling drops, can cause them to become non-compliant with the resultant resurgence in symptoms.

The advantages of punctal occlusion are:

- No dependence on patient adherence, skill or dexterity
- May reduce patient dependence on artificial tears
- Reversible with a good safety profile
- Practice keeps the patient spend (unlike artificial tears)

Research carried out by Positive Impact in 2014-15 revealed that eyecare practitioners perceive punctal occlusion as a last resort and that the procedure is difficult and requires a great deal of training. Interestingly, this is not the view of the latest DEWS report, which advocates considering punctum plugs at dry eye severity level two on its four-point scale. Practitioners fitting plugs also reported that they were easy to insert and remove. It is also the author's personal experience that a skilled contact lens practitioner will quickly and easily pick up the technique.

The BVI range of punctal plugs

All punctal plugs can be broadly split into two types: those for temporary use and those for more permanent placement.

Parasol Punctal Occluder



Figure 3: The Parasol's unique hollow nose cone

Parasol is a 'so-called' permanent plug (it can be easily removed at any time) made of medical grade silicone and utilising a patented design. It has a dome (or cap) at the top of its shaft that prevents it disappearing down the punctum. The unique feature of the Parasol design is that which gives it its name – the hollow nose cone (Figure 3).

The advantages of the Parasol design compared to traditional plug designs are as follows:

1. **Easier to fit.** Being hollow, the nose collapses during insertion making it easier to pass through the punctum opening, preventing the need to dilate it in most cases. Once through it opens up securing it in place.
2. **Excellent retention.** This patented feature makes it the most secure plug design with a retention rate of 92 per cent (McCabe, 2009).
3. **Simple sizing.** Unlike conventional designs that have eight or more sizes (in 1 mm steps), Parasol has just four sizes; 95 per cent of patients can be fitted with just two of them: small (72 per cent) or medium (23 per cent).

Extend Absorbable Synthetic Implants



Figure 4: Extend synthetic implant held in forceps for insertion

The Extend plugs (Figure 4) are made of the same absorbable synthetic material as modern surgical sutures. Consequently, their key feature is that they 'disappear' after three months. This makes them an ideal low cost way of trialing the potential success of occlusion.

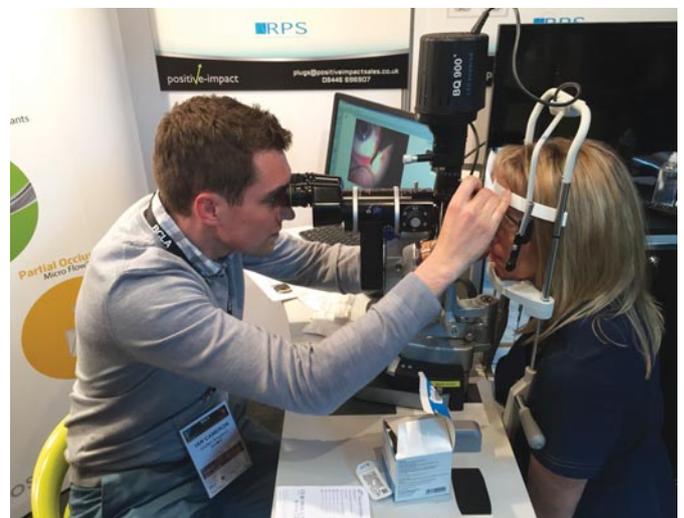
Another benefit of their three-month 'life' is that they can be used on a planned replacement programme. This is ideal for spreading the cost for all dry eye patients, especially contact lens wearers suffering associated dryness, as they can add the cost to their existing direct debit payment plan.

Conclusion

InflammaDry is a unique diagnostic tool that tests for ocular inflammation that would otherwise go undiagnosed. All other dry eye tests measure tear production and stability. A negative InflammaDry test indicates a non-inflammatory cause of dry eye disease, in which case the clinician may consider punctal occlusion as a management strategy.

Punctal occlusion is a simple dry eye management technique that can help resolve dryness symptoms in contact lens and non-contact lens wearers alike. In the past, there was a risk that some patients' symptoms may be exacerbated by plugging due to the risk of accumulation of inflamed tissues on the ocular surface. This risk is now largely removed by introducing a testing protocol that includes InflammaDry.

It keeps the practitioner in control and right at the heart of patient care. As a result, the patient's spend is also retained by the practice – rarely the case with artificial tears, as pharmacies and supermarkets will testify.



Scottish optometrist, Ian Cameron, demonstrating the technique for inserting an Extend implant at last year's BCLA conference