



INCORPORATING AUTOLOGOUS SERUM EYE DROPS INTO YOUR DRY EYE PROTOCOL



What you need to know about this advanced treatment option.

BY REBECCA MILLER, OD

We have seen an exponential increase in dry eye disease (DED), and the number of patients affected is expected to continue to rise in the years ahead.¹ Not only will we see a higher volume of patients with DED, but we will likely see and treat DED in younger patients due to the decreased blink rate with the use of electronic devices and computer vision syndrome.²

Although we don't have a cure for DED, we do have more treatment

options than ever before. Many patients with severe DED may not achieve adequate relief from traditional treatments such as artificial tears, warm compresses, punctal plugs, prescription eye drops, or eyelid treatments. When these important mainstays of treatment don't do the job, additional therapies such as autologous serum eye drops (also known as *serum tears*) may be needed.

Our bodies' natural tears support the ocular surface with growth

factors, proteins, antioxidants, and lipids. These factors are also found in blood serum, but they are lacking in artificial tears. DED reduces the volume and quality of natural tears produced, often causing the ocular surface to become damaged, and this damage results in chronic, painful, burning, gritty-feeling eyes. Research has shown that serum tears are more effective at relieving DED symptoms and healing the ocular surface than artificial tears.³

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GET THE BEST RESULTS

When we consider prescribing serum tears, several unique factors should be discussed with patients. To maximize the quality of serum tears produced, I recommend that patients increase their water intake (approximately 4 L for men and 3 L for women daily) and incorporate *clean* eating in their diet for a week before the blood draw.

What do I mean by clean eating? Keep in mind, a greasy cheeseburger may show up as fatty deposits in the blood and yield poor quality serum tears. I've had patients get frustrated with the lab we use to produce these products, stating, “This batch isn't working as well as the last.”

The processing lab should let patients know if the blood sample is poor quality and collect another sample at another time. This is a great opportunity to remind patients and ourselves that we are what we eat.

EYE DROP COURSE

In the production of serum tears, once the patient's blood is drawn, it is allowed time to clot, then it goes through the centrifuge, is filtered, and finally is diluted to the prescribed concentration. Typically, serum tears should be ready for patients to pick up within 48 hours.

The most commonly asked patient question is, “When will I notice an improvement?” Most patients can

immediately feel the difference with serum tears compared with artificial tears or prescribed drops. I often hear patients say that serum tears are “soothing.”

Significant symptom improvement typically comes around the 2-week mark with regular use. Maximum benefit may be closer to 6 to 8 weeks, which is when I prefer to have patients return for retesting and treatment plan adjustments.

MAKE NECESSARY ADJUSTMENTS

The average initial serum tears treatment I prescribe is 20% concentration, one drop every 2 hours for 3 months. Working with serum tears allows the concentration and dosage to be titrated to maximize each patient's results.

At each visit, I ask the same questions: “What percentage improvement did you receive, and are you happy with how you now see and feel?” Based on their responses, I adjust the concentration and dosing schedule.

You may find that some patients need a higher concentration for adequate relief. Keep in mind that if higher concentrations are specified, the patient is likely to receive fewer vials from the lab.

In other patients, you may see so much improvement in DED signs and symptoms that you decrease the

dosing frequency to better fit the patient's lifestyle.

I recommend that patients maintain at least 6 weeks of diligent treatment before any significant changes are made. The outlier in this scenario would be a patient with a significant epithelial defect that may need an amniotic membrane and/or antibiotic treatment.

When you prescribe serum tears, it's important to consider the dynamic nature of DED. I have several long-term patients for whom I have prescribed serum tears in pulsed doses throughout the year. These patients use the product for 3 months in the winter when their eyes are drier and return to their regular DED treatment for the rest of the year. Although pulsed doses may be effective for some cyclic DED patients, those with chronic symptoms due to systemic conditions (Sjögren syndrome, rheumatoid arthritis, and other autoimmune or inflammatory disorders) will likely benefit from long-term continual use of the tears.

With ongoing use comes the question of cost. The average price for serum tears is \$300 for a 3-month supply, which may be more affordable than other treatment options. Insurance does not usually cover these products.

THE TAKEAWAY

When you prescribe serum tears, make sure your patients are aware that this is not a typical treatment, and that they must follow all instructions to ensure the best results and to avoid contamination of the drops. (See *Patient Guidelines for Using Autologous Serum Tears*.) The open vial must be refrigerated to preserve the healing components and slow the growth of potentially harmful bacteria. All unopened vials can be safely stored in the freezer for up to 3 months, then discarded.

Thankfully, adverse events are rare;⁴ however, it is important to be aware that this is a nonpreserved product. Vials can become contaminated with bacteria or fungus, potentially exposing

PATIENT GUIDELINES FOR USING AUTOLOGOUS SERUM TEARS

- One week prior to the blood draw, increase water intake (4 L for men, 3 L for women daily) and eat a healthy diet.
- Keep the serum tears frozen until time for use.
- Once opened, the vial must be refrigerated and can be used for up to 7 days. (There are no preservatives; a walled thermos cup packed with ice works well for work and travel.)
- Unopened vials must stay frozen (up to 3 months) until time for use.
- If contamination is suspected, discard compromised vials.

the patient to an infection.⁵ As with all treatments, there is some level of risk to consider. For most patients, however, the bigger risk lies in not treating the damage DED has caused.

There are varying perspectives on using serum tears for patients with positive serology testing for infectious diseases such as hepatitis and HIV. Each lab will have its own blood donor guidelines that may disqualify some patients from supplying their own blood for the drops. In these cases, patients may be able to use

donated blood from a family member or obtain some through a blood bank.

Autologous serum eye drops are not FDA approved. Because the drops are a unique blood product, they can't be mass-produced for FDA approval. Serum tears have a long and successful history of treating DED dating back to 1975.⁶

I have been impressed with the improvement patients have achieved while using serum tears. It's an ace up my sleeve for complex DED. If you want to get started, reach out to your

local compounding pharmacy and ask if they make autologous serum eye drops. Each pharmacy may use a different lab to draw blood and may have its own process for blood drop-off. By incorporating serum tears in your therapeutic arsenal, you will be able to offer more comprehensive DED treatment, allowing you to retain these complex patients rather than having them go elsewhere for help. ■

1. Munir WM. Dry eye on the rise for all demographic groups. *American Academy of Ophthalmology*. July 3, 2019. www.aao.org/editors-choice/dry-eye-on-rise-all-demographic-groups. Accessed November 19, 2020.
2. Akkaya S, Atakan T, Acikalin B, Aksoy S, Ozkurt Y. Effects of long-term computer use on eye dryness. *North Clin Istanb*. 2018;5(4):319-322.
3. Celebi AR, Ulusoy C, Mirza GE. The efficacy of autologous serum eye drops for severe dry eye syndrome: a randomized double-blind crossover study. *Graefes Arch Clin Exp Ophthalmol*. 2014;252(4):619-626.
4. Leite SC, de Castro RS, Alves M, et al. Risk factors and characteristics of ocular complications, and efficacy of autologous serum tears after haematopoietic progenitor cell transplantation. *Bone Marrow Transplant*. 2006;38(3):223-227.
5. Thanathane O, Phanphruk W, Anutarapongpan O, Romphruk A, Suwan-Apichon O. Contamination risk of 100% autologous serum eye drops in management of ocular surface diseases. *Cornea*. 2013;32(8):1116-1119.
6. Ralph RA, Doane MG, Dohlman CH. Clinical experience with a mobile ocular perfusion pump. *Arch Ophthalmol*. 1975;93(10):1039-1043.

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