

Contact Lens Performance in the Digital Age

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Introduction

Increased screen time and digital device usage is an inevitable consequence of the rise in remote working and virtual learning. Of particular interest to contact lens practitioners is that viewing digital devices is associated with reduced blink rates, which can negatively impact the ocular surface.¹

We can narrow our focus of desirable contact lens attributes to 4 major factors: providing all day comfort, maximizing flexibility in fitting, minimizing the risks of contamination, and avoiding mechanical insult. If we can accomplish these four goals, we can hope to assure a more comfortable wearing experience with fewer complications and unscheduled visits, as well as reduced attrition rates.

ACUVUE® OASYS 1-Day with HydraLuxe® Technology was developed to be patient-focused and drawn from the natural eye's physiology and function. The EYE-INSPIRED Innovations built into this contact lens family may be a reason it is the most trusted brand of eye care professionals in the US.[†] They help us bring exceptional vision experiences to millions across the world, every day.²

All Day Comfort

Comfort is consistently cited as a reason for dissatisfaction with contact lenses.³ The reasons are complex but looking at the lens in the tear film sheds some light on possible reasons. As shown in Figure 1, the thin tear film and its matrix of mucins that help stabilize the tear film is disrupted when a contact lens is placed on the eye.⁴ The first EYE-INSPIRED Innovation – Moisture Infused for Hydration – attempts to address this issue in a unique way.

The long-chain PVP (polyvinylpyrrolidone) used in HydraLuxe® Technology has many functional similarities to the mucins that are on the cornea and in the tear film, lubricating and moisturizing to help support a more stable tear film.⁵⁻⁷ This helps the lens remain fully hydrated so it retains moisture without removing it from the surrounding ocular environment.⁷ Of course, supporting a stable tear film can offer additional benefits such as maintaining lubricity and helping to achieve a crisp refraction.⁷

And while no lens is perfect for everyone, in 5 clinical studies posted on www.clinicaltrials.gov (a website maintained by the United States National Institutes of Health) that evaluated subjective comfort as a primary or secondary endpoint, ACUVUE® OASYS 1-Day Contact Lenses has never been beaten in comfort.[^]

A second innovation related to comfort is the presence of the antioxidant Norbloc™, that delivers 4 times the antioxidant capacity of Vitamin E (determined in a laboratory study on a mass basis). This helps support comfort by keeping tear film lipids in their natural state when they interact with the lens material.⁸

And finally, ACUVUE® OASYS 1-Day Contact Lenses have an 'Invisible Edge' design so the eyelids glide over them as if nothing is there, further contributing to on-eye comfort.⁹

Given the above, it is perhaps unsurprising that a recent study of contact lens wearers found ACUVUE® OASYS 1-Day was superior to the habitual daily disposable contact lenses in reducing dryness symptoms.^{*,**,*10} (Figure 2). Benefits have been specifically highlighted

for those that reported use of their lenses for 8 or more hours with digital devices: 82% experienced improvement in end-of-day contact lens related dryness after wearing ACUVUE® OASYS 1-Day,¹⁰ and ACUVUE® OASYS 1-Day was preferred 6:1 for overall comfort vs the patients' current daily disposable contact lenses.¹⁰⁻¹¹

Fit Flexibility

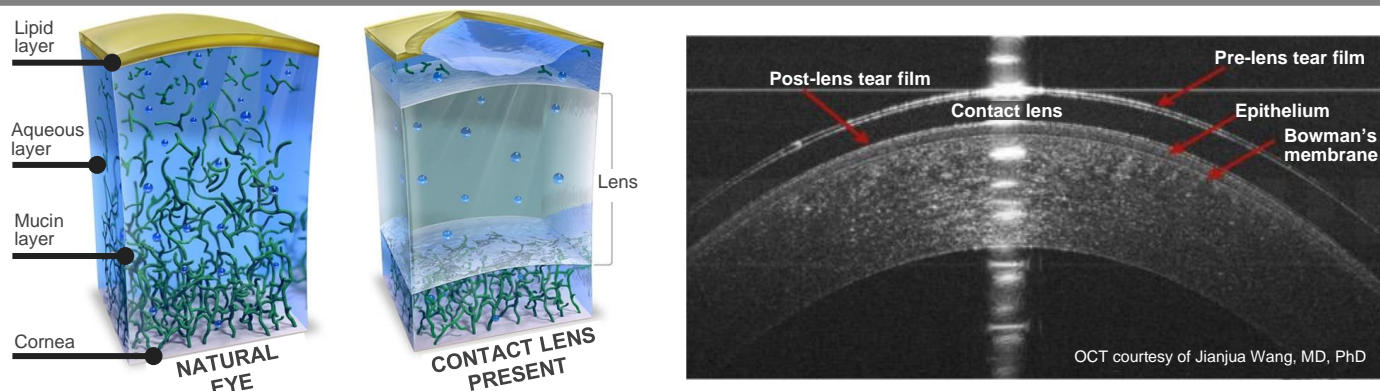
Having a wide variety of parameters and a reliable design is very desirable when selecting a lens of first choice. Because nearly 50% of patients have astigmatism of 0.75D in at least one eye,¹² it is important to have both spherical and toric parameters available, and for the astigmatic fits to be both rapid and accurate.

ACUVUE® OASYS 1-Day for ASTIGMATISM Contact Lenses with Eyelid Stabilized Design are designed to realign naturally with every blink and quickly orient and stabilize within minutes of insertion.¹³ And based on high fit success rates, number of lenses and time required to fit patients during clinical studies, ACUVUE® Brand Contact Lenses for ASTIGMATISM can be fit with sphere-like ease.¹³ And lastly for even more ease and simplicity of fitting, the extensive range of spherical and toric parameters help to accommodate almost all your patients' prescription needs.¹³

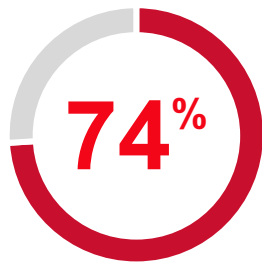
Minimize Contamination

Minimizing the risk of lens and eye contamination is always a priority and daily disposable lenses are a logical choice, as they eliminate potential issues with lens solutions and the lens case. A model set forth by Stapleton that looks at population attributable risk predicts that disease load in daily wear reusable lenses

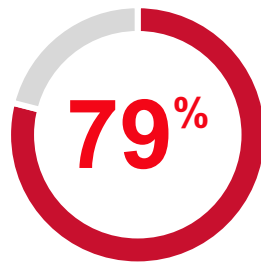
Figure 1. Free-floating mucins in the tear film interact with both the membrane bound mucins at the corneal surface as well as with the hydrophobic heads of the polar lipids of the lipid layer to stabilize the tear film. However, when the 70-100 micron thick contact lens is placed in the 3-5 micron thick tear film, considerable disruption occurs, as shown in the illustration on the left and the OCT image below



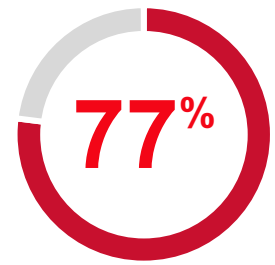
[†]Survey among 250 optometrists in the U.S. conducted from May 2021 to June 2021. [^]www.clinicaltrials.gov is a website maintained by the NIH. The 5 clinical studies evaluated subjective comfort as a primary or secondary endpoint for ACUVUE® OASYS 1-Day with HydraLuxe® Technology. Review conducted as of October 29, 2021. ^{*}Habitual Daily Disposable Contact Lenses included: 1-Day ACUVUE® MOIST (37%), DAILIES® TOTAL 1® (26.1%), DAILIES® AquaComfort Plus® (23.9%), clariti® 1 day (6.5%), and MyDay® (6.5%). ACUVUE® OASYS 1-Day performance measured against other Habitual Daily Disposable Contact Lenses. ^{**}JJV Data on File, 2022. Dryness/Comfort Evaluation of ACUVUE® OASYS 1-Day Brand Contact Lenses vs. Habitual Daily Disposable Contact Lenses in Subjects with Contact Lens Dryness Symptoms (n=92).

Figure 2. Dryness/comfort evaluation of ACUVUE® OASYS 1-Day Brand Contact lenses vs. habitual daily disposable lenses¹⁰


74% of daily disposable contact lens wearers who suffer from contact lens associated dryness experienced improvement in contact lens related dryness symptoms after wearing ACUVUE® OASYS 1-Day.*,**,†



79% of daily disposable contact lens wearers who suffer from contact lens associated dryness had an improved opinion of the contact lens keeping their eyes from feeling dry at the end of the day after wearing ACUVUE® OASYS 1-Day.*,**,†



77% of daily disposable contact lens wearers who suffer from contact lens associated dryness experienced improvement in end-of-day contact lens related dryness symptoms after wearing ACUVUE® OASYS 1-Day.*,**,†

could be reduced by almost two-thirds by attending to just two factors: storage case hygiene and storage case replacement.¹⁴ Daily disposable lenses address both factors; but they do not eliminate risk entirely; careful and consistent attention to good patient instruction and ongoing surveillance of care and hygiene practices are still critical. But they do minimize the opportunity to transfer microbes to the eye, and have been shown to be reduce the severity of disease if it does occur.¹⁴

Minimize Mechanical Insult

Mechanical issues can lead to both comfort issues and irritation of the cornea and eyelids, so it is wise to consider these factors in selecting your “go-to” lens. Modulus is important, but lens design must also be considered, as a thicker lens will be stiffer than a thin one given equal modulus values. A thicker lens may be easier to apply but may be more difficult to remove due to a greater resistance to bending, so it’s the balance that matters.

All ACUVUE® Brand Contact lenses have low modulus values and thin edges, minimizing lid margin/lens interactions, and the astigmatic designs are uniquely thin in the vertical meridian due to the stabilization design employed.⁹ Very low coefficient of friction values create a highly lubricious lens with a silky, smooth feel,⁹ and the low coefficient of friction has also been shown to have a high correlation with comfort.¹⁵ In fact, the lubricity of ACUVUE OASYS® Contact Lenses (between 0 and 18 hours of simulated wear) is comparable to the human cornea.[§]

These factors are not only important with respect to mechanical properties on the eye, but they can also influence lens handling for the patient. During an in-market assessment of 95 prescribers who fit ACUVUE® OASYS 1-Day for ASTIGMATISM to new and existing contact lens wearers, nearly all of the 341 patients who completed the post-assessment survey agreed the lens was easy to handle (97.4% existing wearers and 95.9% neophytes in a post-hoc analysis).¹⁶

All in all, the combination of design and material in ACUVUE® OASYS 1-Day Contact Lenses provides excellent comfort, vision and handling⁹ and is a design that meets the digital demands of modern daily life.[#]

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IMPORTANT SAFETY INFORMATION:

ACUVUE® Brand Contact Lenses are indicated for vision correction. As with any contact lens, eye problems, including corneal ulcers, can develop. Some wearers may experience mild irritation, itching or discomfort. Lenses should not be prescribed if patients have any eye infection, or experience eye discomfort, excessive tearing, vision changes, redness or other eye problems. Consult the package insert for complete information. Complete information is also available from Johnson & Johnson Vision Care, Inc. by calling 1-800-843-2020 or by visiting jnvisionpro.com

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*Habitual Daily Disposable Contact Lenses included: 1-Day ACUVUE® MOIST (37%), DAILIES® TOTAL 1® (26.1%), DAILIES® AquaComfort Plus® (23.9%), clariti® 1 day (6.5%), and MyDay® (6.5%). ACUVUE® OASYS 1-Day performance measured against other Habitual Daily Disposable Contact Lenses in Aggregate. Results do not imply significance against any of the individual brands.

†Improvement indicates a positive (upward) shift in response of at least one box. Example: Shift from baseline response of ‘Agree’ to follow-up response of ‘Strongly Agree’. **JJV Data on File, 2021. Dryness/Comfort Evaluation of ACUVUE® OASYS 1-Day Brand Contact Lenses vs. Habitual Daily Disposable Contact Lenses in Subjects with Contact Lens Dryness Symptoms (n=95). §Using t-test on least-square means from the linear mixed model. Adjusted for multiplicity. JJV data on file, 2020. #The presence of PVP within the lens and at its surface results in a design with low pervaporation which helps to enable comfort during digital device use.