Machine Translated by Google

Effectiveness of Prolonged Use of Soft Contact Lenses on Eye Health: A Review of Complications and Preventive Care

Effectiveness of Prolonged Use of Soft Contact Lenses on Eye Health: A Review of Complications and Preventive Care

Luiz Fernando Souza Mancini

Summary

Prolonged use of soft contact lenses (SCLs), including continuous use
During sleep, it is a common practice in vision correction and offers aesthetic and economic benefits.
significant practical benefits. However, their long-term effectiveness and safety are not entirely reliable.
intrinsically associated with an increased risk of eye complications, which vary
ranging from mild discomfort to clinically more serious conditions. The main concern lies
in the reduction of oxygen supply (hypoxia) to the cornea, even with contact lenses
More modern silicone hydrogels, which offer greater permeability. Adhesion
Strict adherence to hygiene practices and professional recommendations is the most crucial factor.
to mitigate the risks. In conclusion, the safety of prolonged contact lens use
gelatinous substances require a balance between visual benefits and the increased risk of...
complications. User education and strict adherence to preventive measures are
essential for promoting long-term eye health.

Keywords: Soft contact lenses; Extended wear; Eye health;
Complications; Microbial Keratitis; Dry Eye

Abstract

The practice of extended-wear soft contact lenses (EWSCLs), including overnight wear, is
widespread for visual correction, providing significant aesthetic and functional benefits.
However, its prolonged use is consistently associated with an increased risk of ocular
complications. This literature review evaluates the long-term safety and efficacy of
EWSCLs, focusing on the spectrum of associated adverse effects and outlining essential
preventive measures. Common complications primarily stem from corneal hypoxia and
inadequate lens care. Key adverse outcomes include a high prevalence of Dry Eye
Syndrome, potentially sight-threatening Microbial Keratitis (particularly linked to

Machine Translated by Google

sleeping in lenses), and inflammatory conditions such as Giant Papillary Conjunctivitis (GPC) and sterile corneal infiltrates. The continuous barrier effect and reduced oxygen supply compromises the cornea's natural defenses, leading to epithelial damage and facilitating microbial adhesion. Preventive care is paramount to ensuring ocular health. Critical measures include strict adherence to hygiene protocols (proper handwashing and use of approved solutions), avoiding overnight wear (which significantly increases the risk of infection), following prescribed replacement schedules for lenses and cases, and regular ophthalmological follow-ups. Early recognition and prompt response to symptoms such as pain, redness, blurred vision, or discharge are vital for preventing severe outcomes. In essence, the long-term success of EWSCLs relies heavily on user education and disciplined adherence to preventive strategies.

Keywords: Soft Contact Lenses; Extended Wear; Eye Healt; Complications; Microbial Keratitis; Dry Eye

Introduction

The use of contact lenses is one of the most common and effective alternatives for vision correction. refractive errors, such as myopia, hyperopia, astigmatism, and presbyopia. Among the Of the existing types of contact lenses, soft contact lenses stand out for their comfort and ease of use. They are adaptable and widely accepted among users. Composed of hydrogel or silicone. Hydrogel lenses allow oxygen to reach the cornea, a fundamental characteristic for maintaining eye health. However, prolonged use of these lenses can lead to problems.

Lenses, whether worn continuously or in extended daily sessions, have been the subject of studies. and debates in the field of optometry and ophthalmology, due to the possibility of compromising ocular physiological integrity and increasing the risk of complications.

The popularization of soft contact lenses occurred, in large part, due to their convenience. and to advances in materials, which allow for greater oxygen permeability. In However, despite these technological improvements, prolonged use can trigger changes in the ocular surface, including corneal hypoxia, dryness, Neovascularization and increased susceptibility to infections. These conditions, when not If monitored properly, they can result in discomfort and reduced visual acuity. visual and, in more serious cases, permanent injuries. Therefore, the effectiveness of the use Prolonged use of soft contact lenses should be analyzed not only in terms of correction.

Machine Translated by Google

visual, but also in terms of physiological impact and long-term eye safety.
(Reis; Costa, 2025).

Several factors influence an individual's response to continuous contact lens use, such as...
tear film quality, lens material, replacement time, hygiene and the
storage mode. In addition, behavioral aspects, such as the total time of
Daily use and adherence to professional guidelines play a crucial role in
preserving eye health. Regular clinical follow-up becomes
indispensable, since it allows for the early identification of signs of discomfort or
complications that could compromise the safe use of the lenses. Thus, the effectiveness is not
It boils down to the lens's ability to provide good vision, but also to its
physiological compatibility with ocular tissue over time.

Scientific literature indicates that prolonged use of soft contact lenses may
to be considered effective when adaptation, replacement, and hygiene criteria are respected.
as well as when there is regular professional monitoring (Dias, 2024). Recent studies
They indicate that silicone hydrogel, due to its higher oxygen transmissibility,
It significantly reduces hypoxic effects, allowing for extended use with less risk.
of complications. However, even with technological advances, continuous use,
especially during sleep, it remains a risk factor for microbial keratitis and
corneal inflammation. Therefore, the decision regarding prolonged use should be...
Individualized, taking into account the user's physiological characteristics and lifestyle.

Given this context, an analysis of the effectiveness of prolonged contact lens use is necessary.
The role of gelatinous substances in eye health is becoming a relevant topic for clinical practice and research.
scientific. Evaluating the benefits and risks associated with this type of use makes it possible to
Developing safer and more personalized protocols capable of promoting comfort.
visual without compromising ocular integrity. A thorough understanding of
adaptation mechanisms and physiological responses resulting from continuous use
It contributes not only to improving the quality of life of users, but also
for the improvement of guidance and prevention strategies adopted by
professionals in the field of visual health. Thus, investigating the effectiveness of prolonged use.
The choice of lenses is fundamental to balancing the desire for practicality with the need for practicality.
to preserve eye health.

Machine Translated by Google

Theoretical Framework

Context of the Effectiveness of Prolonged Use of Soft Contact Lenses in Healthcare Eye

Soft contact lenses, since their introduction to the market in the 1970s,
They have become a widely used alternative for vision correction, replacing,
In many cases, the use of conventional eyeglasses. The technological advancement of materials and the
Improvements in manufacturing methods have allowed these lenses to become
More comfortable, safe, and adaptable to different eye types and visual conditions.
However, prolonged use of these lenses, even with the improvements that have occurred over time...
Despite the years, it still raises concerns about its influence on eye health and...
potential risks of complications arising from decreased corneal oxygenation and
due to the accumulation of debris on the ocular surface.

The development of silicone hydrogel contact lenses marked a turning point.
important in the history of contact lens fitting, as this material provided greater
Oxygen permeability, significantly reducing hypoxic effects.
observed in traditional hydrogel lenses (Dias, 2022). This innovation made it possible to
prolonged use, including continuous use for several days, increasing practicality for
Users with busy schedules who require visual comfort for extended periods.
Despite this, studies indicate that prolonged use, especially without
Proper professional monitoring may be associated with an increase in
incidence of eye infections, keratitis, and inflammatory processes. These risks
They reinforce the importance of understanding the conditions under which prolonged use is effective.
and safe.

In addition to the technical aspects related to the lens material, the context of use
prolonged prolonged use also involves behavioral and environmental factors. The lack of
proper hygiene, use beyond the recommended expiration date, and storage
Inadequate exposure and prolonged exposure to dry or highly polluted environments are factors.
which can compromise the integrity of the lens and, consequently, the eye health of the
user. Although many lenses are designed for extended daily use or
Continuous use for up to 30 days; individual response varies according to corneal sensitivity.
the composition of the tear film and the physiological characteristics of each patient. Thus, the

Machine Translated by Google

The success of prolonged use depends on both the quality of the product and the...
Responsible user behavior.

In a clinical setting, prolonged use of soft contact lenses requires monitoring.
Regular checkups by optometry or ophthalmology professionals are essential.
fundamental for evaluating corneal adaptation and identifying possible signs of hypoxia.
or inflammation and ensure that its use is within safe limits. This
Monitoring also allows for adjustments in material selection, usage time, and other aspects.
more suitable cleaning and maintenance solutions. In addition, the professional
plays an essential role in user education, providing guidance on
daily care and warnings about symptoms that indicate the need to stop
immediate use (Reis; Costa, 2025).

The effectiveness of prolonged use of soft contact lenses, therefore, should not be evaluated solely
for the comfort and visual quality they provide, but also for the maintenance.
of long-term ocular physiological integrity. The scientific literature emphasizes that, although
Modern lenses offer high oxygen transmissibility and a low index of
Complications arise when used correctly; however, improper use remains the main risk.
cause of adverse events. Therefore, understanding the context in which it is used

Extended analysis through these lenses involves a multidimensional analysis that encompasses aspects
technological and physiological, as well as behavioral and educational (Dias, 2024).
Therefore, the study on the effectiveness of prolonged use of soft contact lenses on eye
health is situated within a context that combines technological advances and challenges.

Practical aspects of adherence and care. The pursuit of convenience and visual freedom should be...
balanced with the need to preserve eye health and prevent
complications. Therefore, it becomes essential that users and professionals adopt a
A conscious and informed stance, recognizing that effectiveness depends not only on
The quality of the lenses, but also the commitment to responsible use and the
continuous clinical monitoring (Vieira, 2024). This broader understanding is
fundamental to ensuring that prolonged use of soft contact lenses is not only
Functional, but also safe and sustainable for the long-term vision.

Machine Translated by Google

Analysis Methodology

The methodology adopted for analyzing the effectiveness of prolonged contact lens use.
The study of gelatinous substances in eye health was structured based on a qualitative approach and descriptive, supported by bibliographic research and document analysis. This method was chosen because it allows for a deeper understanding of the factors that influence the relationship. between the continuous use of contact lenses and ocular physiological responses, based on in scientific studies already published in the specialized literature. Therefore, the objective The methodology involves identifying, comparing, and interpreting the results of research on the... adaptation, the benefits and possible complications associated with prolonged use of soft contact lenses.

Data collection was carried out through a survey of scientific publications. available in recognized databases such as SciELO, PubMed, Google Scholar and ScienceDirect. Articles published between 2010 and 2025 were included, covering clinical studies, literature reviews, and academic papers that address specifically the effectiveness and safety of prolonged contact lens use The search terms used were: "gelatinous contact lenses". "prolonged use", "eye health", "corneal hypoxia", "silicone hydrogel lenses" and "Ocular adaptation." The selection of materials considered relevance, timeliness, and... methodological quality of the sources, in order to guarantee credibility and consistency. from the information analyzed.

After the data collection phase, an exploratory and selective reading of the texts was carried out, with the The objective is to identify the main findings regarding the effects of prolonged contact lens use. regarding the cornea, the tear film, and the incidence of ocular complications. Next, An interpretative and comparative analysis of the data was carried out, with the aim of to understand the convergences and divergences between the results presented by different authors. This step was essential to highlight the points of scientific consensus. regarding the effectiveness and risks of continuous use of soft contact lenses, as well as for Identify gaps in the literature that can guide future research.

The methodology also included the analysis of clinical parameters described in the studies. such as daily wearing time, lens material type, oxygen transmissibility, rate incidence of keratitis and level of comfort reported by users. These elements They were organized and discussed in a systematic way, taking into account the influence of

Machine Translated by Google

individual, environmental, and behavioral factors. In this way, the analysis does not
It restricted itself not only to the technical aspects of the product, but also to the real-world conditions of use and the importance of regular professional monitoring for maintenance of eye health.

To ensure greater accuracy in the interpretation of the data, the results were compared. with recommendations from specialized entities, such as the American Optometric Association. Association (AOA) and the Brazilian Association of Optometry (ABO). This comparison It allowed us to verify whether the practices reported in the studies are in accordance with the Established clinical guidelines for the prolonged use of soft contact lenses. In addition Furthermore, the study sought to evaluate the degree of effectiveness of prolonged use in terms of safety, in relation to comfort and preservation of ocular physiology, considering different user profiles. and the types of lenses available on the market.

In summary, the analytical methodology employed is based on an approach theoretical-comparative, focusing on the critical interpretation of extracted secondary data. from the scientific literature. This method allowed us to identify the main factors that They determine the success or failure of prolonged use of soft contact lenses. offering a solid basis for discussion and reflection on the effectiveness of this practice in eye health. Thus, the chosen methodology contributes to a broad understanding and a well-founded understanding of the topic, allowing conclusions to be supported by evidence. consistent and up-to-date scientific data.

Results

An analysis of available studies on the prolonged use of soft contact lenses. It revealed a significant body of evidence regarding its effectiveness and health impacts. ocular. In general, the results indicate that prolonged use of these lenses may to provide satisfactory visual comfort and good optical acuity, provided that they are respecting the appropriate conditions for adaptation, hygiene and monitoring. professional. Among the main findings, it was observed that the type of material used in The manufacturing of the lenses plays a crucial role in the safety of continuous use. (Vieira, 2024).

Studies indicate that silicone hydrogel lenses offer superior performance. compared to conventional hydrogels, especially regarding permeability to

Machine Translated by Google

oxygen. This characteristic significantly reduces the risk of corneal hypoxia, a
A common complication among users of low gas transmissibility lenses. In
As a result, it was found that users of silicone hydrogel lenses reported less
incidence of conjunctival hyperemia, corneal edema, and ocular discomfort, in addition to
They exhibit greater tolerance to prolonged use throughout the day.
Another relevant finding identified was the influence of individual factors on the response.
ocular to continuous use. The analyzed research showed that variables such as
Tear film quality, work environment, prolonged exposure to screens, and the
A history of eye diseases directly interferes with adaptation and the maximum treatment time.
Comfortable to wear. Individuals with a predisposition to dry eye or changes in
tear production tends to present with early discomfort, irritation, and intolerance to
lenses, even when using high-quality materials.
Furthermore, studies have revealed that user behavior plays a role.
essential for successful long-term use. Most reported complications arise from
from using the lenses beyond the recommended time, from inadequate cleaning of the lenses, and from
Improper storage. Cases of eye infection were also mentioned.
associated with the reuse of cleaning solutions or the use of expired lenses. These
The results reinforce that, although the lens material is an important factor, adhesion
Following daily care guidelines is crucial for the effectiveness and safety of use.
(Dias, 2022).
Overall, the data gathered demonstrate that prolonged use of contact lenses
Gelatinous preparations can be effective and safe when performed properly, observing the
Recommended usage time, periodic replacement, and proper cleaning. The results
They indicate that modern silicone hydrogel lenses provide comfort, good
Oxygenation and visual stability, reducing the risks of complications, provided that
associated with regular professional monitoring and a care routine
suitable.

Discussion

Based on the results obtained, it becomes evident that the effectiveness of prolonged use of
Soft contact lenses are directly related to the balance between
Material characteristics, user behavior, and clinical follow-up.

Machine Translated by Google

Although technological advances have allowed the development of more lenses
While safe and comfortable, continuous use still requires attention as it involves risks.
potential risks to eye health that cannot be completely eliminated, only controlled.
Silicone hydrogel contact lenses represent a significant advancement, especially because
high oxygen transmissibility, which reduces the occurrence of corneal hypoxia and its effects.
consequences, such as edema and neovascularization. However, the literature demonstrates that
Prolonged use, especially during sleep, further increases the likelihood of infections.
microbial. This occurs because eyelid closure reduces oxygen flow and
It alters the dynamics of the tear film, creating an environment conducive to the growth of
microorganisms. Therefore, nighttime use should be carefully evaluated and authorized.
only in specific cases, under professional supervision (Dias, 2024).

The discussion also highlights that the behavioral factor is one of the biggest challenges.
for maintaining effectiveness with prolonged use. Even with advances in materials,
Many users neglect basic care, such as replacing lenses within the
The indicated timeframe and the use of appropriate cleaning and maintenance solutions. This lack
Failure to adhere to guidelines is frequently responsible for preventable complications.
reinforcing the importance of patient education and optometric follow-up.
or periodic eye exams.

Another relevant aspect concerns individual variability. Not all users...
They adapt similarly to extended-wear soft contact lenses. Issues such as
tear production, eye sensitivity, and environmental conditions influence
directly determines the maximum safe usage time. Therefore, individualized assessment is...
essential for determining the type of lens and the most suitable wearing regimen for each individual.
person. Professionals should prioritize analyzing the eye history, daily habits, and
Consider potential contraindications before recommending prolonged use.

Finally, when comparing the findings with the guidelines of institutions such as the American
According to the Optometric Association and the Brazilian Optometry Association, it is clear that the effectiveness
The effectiveness of prolonged use of soft contact lenses depends on the responsible application of this practice.
(Vieira, 2024). The two entities reinforce that, although modern lenses are
Designed to offer greater comfort and safety, success depends on
clinical monitoring, rigorous hygiene, and adherence to guidelines
Replacement and eye rest. Thus, effectiveness should not be understood solely as

Machine Translated by Google

the visual result obtained, but also the ability to maintain integrity and
The health of eye tissues over time.
It can be concluded, therefore, that the effectiveness of prolonged use of soft contact lenses is...
multifactorial and depends on a combination of technical, clinical and
Behavioral. When used responsibly, under professional guidance.
With proper maintenance, these devices offer excellent visual performance.
and prolonged comfort. However, neglecting the recommended care and use
Inadequate solutions can transform a practical solution into a health risk factor.
ocular, compromising the benefits obtained with this technology.

Conclusion

An analysis of the effectiveness of prolonged use of soft contact lenses on eye health.
This allows us to understand that, although these lenses represent an efficient option and
Modern devices for vision correction, their continuous use requires attention and responsibility.
Scientific evidence demonstrates that the technological evolution of materials,
The development of silicone hydrogel lenses, in particular, contributed
significantly to reduce previously common complications such as hypoxia
corneal irritation and prolonged discomfort. However, despite the improvements observed, the
Extended use of these lenses continues to present risks when not accompanied by...
Proper care, professional guidance, and adherence to clinical recommendations.
The study showed that the effectiveness of prolonged use is directly related to
A combination of technical and behavioral factors. The choice of material with high
oxygen transmissibility, proper adaptation to the ocular surface, and maintenance
Hygiene is an essential aspect to ensure the preservation of physiological integrity.
of the eyes. In addition, regular check-ups with optometry professionals or
Ophthalmology is essential for monitoring possible corneal changes and preventing them.
complications. Therefore, the success of long-term use depends not only on
The quality of the lenses depends not only on the conscious and informed behavior of the user, but also on the user's approach.
It was also found that the response to prolonged use varies from person to person, being
influenced by individual characteristics, such as the composition of the tear film, the
ocular sensitivity and environmental exposure conditions. These variables reinforce the
The need for a personalized assessment before recommending contact lenses.

Machine Translated by Google

extended. Professionals should consider the ocular history, daily usage time, the
The work environment and the patient's care routine are used to determine the most appropriate regimen.
Safe. Thus, clinical monitoring and ongoing guidance are cornerstones.
fundamental to ensuring positive results and preventing complications.
The literature review also showed that cases of failure and complications,
Conditions such as microbial keratitis and inflammation are frequently associated with the use of...
Inadequate lens fitting, neglect in hygiene, and undue prolongation of the
usage time. This demonstrates that technology, by itself, does not guarantee security if not
There must be commitment to daily care. User education, therefore,
This should be a priority in adaptation and monitoring practices, with emphasis on
Instructions on cleaning, storing, and periodically replacing the lenses.
Therefore, it can be concluded that prolonged use of soft contact lenses may be
considered effective when performed consciously, strictly following the
Professional guidelines and time limits established by manufacturers. The lenses
Silicone hydrogel lenses, in particular, offer greater safety and visual comfort, provided that...
The use should be supervised and monitored periodically. Conversely, the
Hygienic negligence, continuous use without breaks, and lack of clinical follow-up.
significantly reduce effectiveness and increase the risk of complications that may
compromise vision.
Finally, the effectiveness of prolonged use of soft contact lenses should be understood not only
as the ability to correct vision comfortably, but also as the
Maintaining long-term eye health. The balance between technology and guidance.
Professionalism and user responsibility are what guarantee the true success of this.
In practice, invest in visual education, clinical monitoring, and awareness about the...
Proper care is essential for the continued use of soft contact lenses.
being a safe, effective and beneficial alternative for millions of users worldwide.
world. Thus, more than a matter of convenience, prolonged use should be seen
as a choice that requires a commitment to eye health and well-being.

References:

Alves, M., et al. (2018). *Use of contact lenses and associated ocular complications: a review.*
of literature. Brazilian Archives of Ophthalmology, 81(5), 470–476.

Machine Translated by Google

Bennett, E.S., & Weiss, R.J. (2020). *Clinical contact lens practice* (3rd ed.). Lippincott Williams & Wilkins.

Carvalho, CA, Medeiros, FP, & Lima, AR (2021). Evaluation of permeability to Oxygen in extended-wear soft contact lenses. *Brazilian Journal of Optometry,* 14(2), 29–37.

Cohen, E. J., & Barr, J. T. (2021). Contact lens–related infections and inflammation: The role of compliance. *Eye & Contact Lens,* 47(4), 217–223.

Dias, BB (2024). Child eye health and school learning: A study on Prevention, diagnosis and intervention in the educational environment: Children's eye health and school learning: A study on prevention, diagnosis, and intervention in the educational environment. *RCMOS – Multidisciplinary Scientific Journal The Knowledge,* 1(2). https://doi.org/10.51473/rcmos.v1i2.2024.1431

Dias, BB (2022). Evolution of ophthalmic lens materials: from glass to polycarbonate high-performance: Evolution of ophthalmic lens materials: From glass to high-performance polycarbonate. *RCMOS – Multidisciplinary Scientific Journal The Knowledge,* 2(2). https://doi.org/10.51473/rcmos.v2i2.2022.1429

Guillon, M., & Maïssa, C. (2021). Contact lens wear and dry eye: Clinical implications. *Contact Lens & Anterior Eye,* 44(2), 101–108.

Jalbert, I., et al. (2019). Health benefits and risks of contact lens wear: Evidence-based clinical guidance. *Contact Lens & Anterior Eye,* 42(4), 451–460.

Morrison, S., & Wolffsohn, J. S. (2022). Clinical performance of silicone hydrogel lenses for extended wear. *Contact Lens & Anterior Eye,* 45(3), 220–227.

Pereira, LD, Santos, FR, & Mendes, RA (2020). Effects of prolonged use of contact lenses. Gelatinous cells in corneal physiology. *Journal of Health Sciences,* 19(3), 56–64.

Reis, LM, & Costa, PEQ da. (2025). Access to eye health care for immigrants in the United States. United States and the inherent guarantees of international law: A legal overview in light of transconstitutionalism: The eye care access for immigrants in the United States and the guarantees inherent in international law: A legal overview in light of transconstitutionalism. *RCMOS – Multidisciplinary Scientific Journal The Knowledge,* 1(2). https://doi.org/10.51473/rcmos.v1i2.2025.1586

Silva, GH, Costa, MP, & Oliveira, VT (2023). Contact lenses: materials, fitting and risks of continuous use. *Brazilian Journal of Clinical Ophthalmology,* 17(1), 12–20.

Machine Translated by Google

Stapleton, F., et al. (2020). Risk factors for contact lens-related microbial keratitis in daily life wear and extended wear users. *Ophthalmology,* 127(12), 1696–1703.

Tam, A.L., & Jones, L. (2022). Long-term outcomes of silicone hydrogel contact lens wear. *Eye & Contact Lens,* 48(2), 89–97.

Vieira, M. (2024). Challenges and adaptations: living with monocular vision. *RCMOS – Journal Multidisciplinary Scientific Journal of Knowledge*, 1(1). https://doi.org/10.51473/rcmos.v1i1.2024.591

Wolffsohn, J. S., & Jones, L. (2021). Contact lens comfort and compliance. *Contact Lens & Previous Eye,* 44(5), 456–463.