Treating Contact Lens Discomfort With Orthokeratology

Study Protocol & Statistical Analysis Plan

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INTRODUCTION & RATIONALE

Soft contact lenses (SCL) are the most common CL modality, used by over 140 million people in the world.[1,2] Despite many improvements in CL materials, solutions, and the addition of rewetting drops to improve comfort, research has shown that approximately half of established CL wearers permanently discontinue CL wear because of ocular dryness and discomfort.[3,4] The symptoms and decreased wear times associated with Contact Lens Discomfort (CLD) are likely related to dry eye disease and meibomian gland dysfunction.[3,5-8] However true CLD, as defined by the International Workshop on Contact Lens Discomfort, only exists while wearing CLs.[9]

In a survey conducted by Dumbleton et al., half of previous and current CL wearers reported they would like to be able to wear CL for more hours during the day.[10] Of those who discontinued CL wear, the number one reason for shorter CL wear time was lens discomfort. Of those who discontinue CL wear, higher proportions were in daily disposable CLs.[10] Even with the introduction of siliconehydrogel materials and daily disposable CLs, reports of CL discomfort and discontinuation continue to be relatively steady.[10-12] Those who discontinued CL wear tend to be of older age and have worn CL for a shorter amount of time than current wearers.[8,10]

Given that wearing CLs is the primary instigator of CLD, avoiding CL wear during the day could eliminate the symptoms related to longs hours of CL wear. In fact, CL removal is a primary way that patients with CLD treat their condition.[7] One-way to avoid CLD during the day could be to wear orthokeratology lenses. Orthokeratology is a form of corneal reshaping rigid CL that is worn primarily during sleep to temporarily reduce refractive error and free patients from CLs or spectacles while awake.[13,14] According to Richdale et al., 40 percent of those who discontinued CL wear reported having or wanting to have refractive surgery.[8] Orthokeratology can offer an alternative to refractive surgery for the patients who are interested or who are not currently a candidate for surgery.[15]

Orthokeratology CLs have yet to be fully explored for the treatment of CLD, though some support for this practice exists in the literature. Carracedo et al., Lipson et al., and Garcia-Porta et al. found that orthokeratology resulted in better ocular comfort than SCLs.[11,16,17] Nevertheless, all three studies excluded subjects who had been diagnosed with dry eye and all three studies used symptoms surveys that were not specific to assessing CLD. Garcia-Porta et al.'s study was also limited by included both neophytes and established CL wearers.[11] Yet, these studies overall suggest that orthokeratology could be used as a treatment for CLD, and one case report has even found that orthokeratology is a viable option for treating CL intolerance.[18]

To date, there has yet to be a study fully investigating orthokeratology as an alternative to SCL use in patients with CLD. Therefore, the purpose of this study is to formally investigate if orthokeratology is a good alternative to SCLs for patients who are experiencing CLD or for patients who have dropped out of CLs because of CLD. This study will also simultaneity evaluate the neophyte orthokeratology wearing experience with hopes of finding additional means for improving CL comfort. Knowing the success of orthokeratology in wearers with CLD will allow practitioners to better help and prescribe for those who may have experienced or at risk for experiencing CLD. It may also be a way to allow patients additional years of CL wear.

SPECIFIC AIMS

This study will address the following specific aims and associated hypotheses:

Aim 1: Determine if refitting patients into orthokeratology can improve ocular symptoms in SCL wearers who have CLD. Hypothesis 1: Orthokeratology will provide better comfort than SCLs in patients who experience CLD.

Aim 2: Gain a comprehensive understanding of a neophyte orthokeratology wearer's initial wearing experience. Hypothesis 2: Neophyte orthokeratology wearers are able to quickly adapt to orthokeratology and easily learn the process of orthokeratology CLs wear.

STUDY DESIGN

Subjects & Sample Size:

This will be a multi-visit study conducted at the University of Alabama at Birmingham (UAB). Subjects will be recruited from UAB's patient database and the greater Birmingham, AL area via postcards, email, social network postings (i.e., Facebook), or fliers. Subjects who self-report that they experience CLD while wearing SCLs or report that they have recently discontinued CL use because of discomfort will be recruited to participate in the study. Subjects will then be screened with the Contact Lens Dry Eye Questionnaire (CLDEQ)-8, and subjects who have clinically meaningful (CLDEQ-8 scores $\geq$ 12, which is an established cutoff) CLD will be enrolled in the study.[19] Recent CL dropouts (<6 months) will be asked to report to the study while wearing a pair of their most recently prescribed SCLs. CLDEQ-4 scores (Rasch validated version; max score of 18) will serve as the primary outcome in this study. Internal data from my laboratory suggests that the average contact lens wearer has a mean CLDEQ-4 score of 7.6 ± 3.8. A 4-point difference in CLDEQ-4 scores will be considered a clinically meaningful improvement in CL comfort when comparing CL comfort at baseline to the 1-month, main outcome visit. Therefore, 30 subjects will be needed to determine if orthokeratology CLs are able to improve CLD (power = 80%; alpha = 0.05). After adjusting for 20% dropout, a total sample size of 36 subjects will be needed to complete the objectives of this study. An additional six subject are being requested in case subjects screen fail during the baseline visit; therefore, a total sample size of 42 will be requested; however, only a maximum of 36 subjects will be treated with orthokeratology.

Inclusion and Exclusion Criteria:

Subjects between 18 and 45 years of age who have completed a comprehensive eye exam within the past two years will be recruited. Subjects will then be asked to enroll in the clinical study if they indicate that they have CLD or if they have discontinued CL use because of discomfort within the past 6 months. Subjects must meet the refractive requirements of the Emerald™ Contact Lens (Oprifocon A, Euclid Systems Corporation), which include having -5.00 diopters or less myopia with less than 1.50 diopters of cylinder and keratometry values between 40.00 D and 46.00 D.

Subjects will also be excluded if they have a history of past orthokeratology use, a history of herpetic eye disease, a history of ocular surgery within the past 12 months, a history of severe ocular trauma, active ocular infection or inflammation, ocular disease other than dry eye, are currently using Accutane or ocular medications, or if they are pregnant or breast feeding. Subjects with a condition or in a situation, which in the examiner's opinion, may put the subject at significant risk, may confound the study results, or may significantly interfere with their participation in the study will also be excluded.

Subject Screening:

All subjects will be pre-screened with a scripted phone interview to verify that they meet all potential inclusion and exclusion criteria. Eligible subjects will then be invited to participate in the clinical study.

Methods:

All clinical measurement will be obtained from both eyes of each eligible subject and testing will be performed in the below order. Testing order was designed to sequentially administer the least invasive to most invasive test. This methodology will ensure that a previous procedure will have a minimal effect on all subsequent assessments.[20]

Baseline Visit (Visit One)

1. Subject History, Eligibility, Informed Consent: Completion of an eye exam within the past two years will be verified at this time by obtaining a signed, unexpired glasses prescription or some other form of documentation from each study subject's eye care provider. Subjects will also be required to provide documentation of their most recent CL prescription at this time (e.g., CL prescription, CL boxes). Subjects will then be required to complete the CLDEQ-8 to verify that they have clinically meaningful CL discomfort. Non-eligible subjects will be dismissed at this time or rescheduled depending upon the reason for ineligibility. Eligible subjects will be enrolled, consented, and requested to sign a health privacy document at this time.

2. Questionnaires: All subjects will be asked to complete the Standard Patient Evaluation of Eye Dryness (SPEED) Questionnaire to acquire an additional measure of dry eye severity, an orthokeratology quality of life survey (University of Michigan Vision Correction Quality of Life), and a study specific survey to better understand the patient's health and CL history.[21,22]

3. Visual Acuity: The subject's best correct visual acuity with most recent CL will be measured with a high-contrast Bailey-Lovie (logMAR) chart, and visual acuity will be recorded in both Snellen and logMAR.

Note: Habitual contact lenses will be removed at this time by the patient.

4. Pupil Size: Pupils will be measured under standard lighting conditions and under dim conditions with an optometric millimeter ruler.

5. Manifest Refraction: The investigator may use an autorefractor to obtained a baseline understanding of the patient's refractive error. The investigator will determine the subject's refractive error with a phoropter, and binocular balance will be performed if best-corrected visual acuity is equal in between eyes.

6. Slit-Lamp Biomicroscopy: A slit-lamp biomicroscope will be used to document normal and/or remarkable findings of the anterior eye structures: eyelashes (blepharitis), eyelids, conjunctiva, and cornea. Eyelids will be graded based upon a grading scale that was developed by the investigators.

7. Non-invasive break-up time (NIBUT): The Oculus Keratograph 5M multifunctional topographer will be used to determine the subject's NIBUT.[23] The Keratograph 5M will be positioned over the subject's eye and then focused. The subject will then be asked to look into the instrument and be asked to blink three times. After the third blink, the subject will be asked to keep their eyes open and to not blink for as long as possible. The investigator will use a stopwatch to determine the number of seconds required for the first distortion to appear in the array of Placido disk rings. The subject will then be allowed to blink normally for ten seconds before repeating the procedure on the fellow eye. NIBUT will be repeated in triplicate for each eye and averaged.

8. Tear Meniscus Height: The Keratograph 5M will be used to determine the subject's tear meniscus height.[23] The subject will be asked to blink at a normal rate and remain still until the investigator has captured the image to measure the tear meniscus height. Three pictures will be captured per each eye to minimize the dynamic variability of tear volume with blinking.

9. Phenol Red Thread: Tear volume will be assessed with PRTT while the subject is sitting at the Keratograph 5M. In brief, a string will be placed at the temporal third of the lower right eyelid. The subject will then be asked to close their eyes lightly for 15 seconds. The examiner will then measure the length of wetting.

10. Conjunctival Staining: A sterile lissamine green strip will be wet with sterile saline and applied to the superior bulbar conjunctiva. After waiting two minutes, conjunctival staining will be assessed while the subject is looking laterally (right & left). The severity of staining will be graded in 6 conjunctival zones per eye following the NEI scale.[24]

11. Aesthesiometer: The aesthesiometer filament will be extended to full length and applied to the cornea. The filament will be retracted until the subject is able to feel the filament and the filament length will be recorded.

12. Corneal Topography: The investigator will use the Keratograph 5M to obtain keratometry values and horizontal visible iris diameter (HVID) with the instrument's standard software.

13. CL Fitting: All subjects will be fitted empirically with the Emerald™ Contact Lens for Overnight Orthokeratology (Oprifocon A, Euclid Systems Corporation) based upon the baseline measurements obtained above (refraction, topography, horizontal visible iris diameter), and CLs will be ordered accordingly. The subject will be scheduled for a dispense visit, which will take place about one week after their baseline visit.

Dispense Visit (Visit Two)

1 Visual Acuity: A Bailey-Lovie (logMAR) chart will be used to evaluate visual acuity as described above.

2. Slit-Lamp Biomicroscopy: A slit-lamp biomicroscope will be used to evaluate ocular health as described above.

3. CL Dispense: Orthokeratology contact lenses will be dispensed and evaluated according to Emerald's fitting guide. Soft contact lens will also be evaluated for temporary use while vision is stabilizing with orthokeratology contact lenses (1-day Acuvue Moist).

4. Application and Removal Training: The patient will be educated how to properly use their CLs. The subject will also be giving health education materials (Healthy Gas Permeable Contact Lens Habits form) that will best direct them how to use their CLs while at home, and they will be given all needed care products (ClearCare [hydrogen peroxide care system]) and trial soft CLs to help with vision while adjusting to orthokeratology (1-day Acuvue Moist). If the patient successfully completes the application and removal training, they will be schedule for their one-day follow up visit. If they fail their training session, they will be rescheduled for an additional training session.

Day One Visit (Visit Three)

1. Questionnaires: All subjects will be asked to complete the CLDEQ-8 and SPEED Questionnaires to judge CL and ocular comfort.

2. Visual Acuity: The subject's visual acuity will be measured with a high-contrast Bailey-Lovie (logMAR) chart, and visual acuity will be recorded in both Snellen and logMAR.

3. Slit-Lamp Biomicroscopy: A slit-lamp biomicroscope will be used to evaluate ocular health as described above.

4. Non-invasive break-up time (NIBUT): The Oculus Keratograph 5M multifunctional topographer will be used to determine the subject's NIBUT as described above.[23]

5. Tear Meniscus Height: The Keratograph 5M will be used to determine the subject's tear meniscus height as described above.[23]

6. Phenol Red Thread: A PRT will be used to evaluate tear volume as described above.

7. Conjunctival Staining: Lissamine green will be used to evaluate conjunctival staining as described above.

8. Aesthesiometer: An aesthesiometer will be used to evaluate corneal sensitivity as described above.

9. CL Evaluation: The subject's CLs will be evaluated as directed by Emerald's fitting guide (visual acuity, refraction, topography). No lens adjustments will be made at this time unless absolutely medically necessary. The subject will be schedule for their 1-week follow-up visit.

One-Week Visit (Visit Four)

1. Questionnaires: All subjects will be asked to complete the CLDEQ-8 and SPEED Questionnaires to judge CL and ocular comfort. The subject will also be asked to complete an investigator-designed survey that is aimed at understanding the patient's initial wearing experience.

2. Visual Acuity: A Bailey-Lovie (logMAR) chart will be used to evaluate visual acuity as described above.

3. Slit-Lamp Biomicroscopy: A slit-lamp biomicroscope will be used to evaluate ocular health as described above.

4. Non-invasive break-up time (NIBUT): The Oculus Keratograph 5M multifunctional topographer will be used to determine the subject's NIBUT as described above.[23]

5. Tear Meniscus Height: The Keratograph 5M will be used to determine the subject's tear meniscus height as described above.[23]

6. Phenol Red Thread: A PRT will be used to evaluate tear volume as described above.

7. Conjunctival Staining: Lissamine green will be used to evaluate conjunctival staining as described above.

8. Aesthesiometer: An aesthesiometer will be used to evaluate corneal sensitivity as described above.

9. CL Evaluation: The subject's CLs will be evaluated as directed by Emerald's fitting guide (visual acuity, refraction, topography). Lens adjustments will be made at this time if the contact lens fit is deemed unacceptable, and the appropriate follow-up visit will be scheduled. If the lens fit is deemed acceptable, the subject will be schedule for their 1-month follow-up visit.

One-Month Visit (Visit Five)

1. Questionnaires: All subjects will be asked to complete the CLDEQ-8, University of Michigan Vision Correction Quality of Life, and SPEED Questionnaires to judge CL and ocular comfort. The subject will also be asked to complete an investigator-designed survey that is aimed at understanding the patient's initial wearing experience.

2. Visual Acuity: A Bailey-Lovie (logMAR) chart will be used to evaluate visual acuity as described above.

3. Slit-Lamp Biomicroscopy: A slit-lamp biomicroscope will be used to evaluate ocular health as described above.

4. Non-invasive break-up time (NIBUT): The Oculus Keratograph 5M multifunctional topographer will be used to determine the subject's NIBUT as described above.[23]
5. Tear Meniscus Height: The Keratograph 5M will be used to determine the subject's tear meniscus height as described above.[23]

6. Phenol Red Thread: A PRT will be used to evaluate tear volume as described above.

7. Conjunctival Staining: Lissamine green will be used to evaluate conjunctival staining as described above.

8. Aesthesiometer: An aesthesiometer will be used to evaluate corneal sensitivity as described above.

9. CL Evaluation: The subject's CLs will be evaluated as directed by Emerald's fitting guide (visual acuity, refraction, topography), and the subject will be asked if they wish to continue wearing the CLs. If the subject would like to keep wearing the CLs, their prescription will be released at this time. All subjects will then be released from the clinical portion of the study.

Three-Month Visit (Visit Six)

1. Phone Survey: All subjects will be asked to complete an investigator-designed survey to gauge the patient's satisfaction with orthokeratology. All subjects will also be asked to complete the CLDEQ-8, University of Michigan Vision Correction Quality of Life, and SPEED Questionnaires to judge CL and ocular comfort. The surveys will be sent electronically to the subject to be completed, and if the patient fails to complete the surveys electronically, the subject will be called to administer the survey over the phone. All subjects will be released from the study after the completion of this survey.

DATA ENTRY AND MANAGEMENT

Surveys will be administered via a secured web service (https://www.qualtrics.com/) at the time of the study visit, and exam data will be entered into the same site after the completion of each study visit. The online survey instrument will be designed on Qualtrics software. All data will be stored on Qualtrics servers, which meet the Health Insurance Portability and Accountability Act (HIPAA) standards and are secured against both physical and digital intrusion. Qualtrics will not be able to access subject's responses unless a request is made by the Principal Investigators to Qualtrics for assistance that would require their involvement with the data. All access is password protected, and data will only be stored electronically.

Risk to subjects, including a breach of confidentiality, is mitigated by the security measures utilized by Qualtrics. Physical access to the servers storing survey results is protected by a 24-hour security team, keycard and biometric authentication, digital surveillance, internally located server housings,

and backup power generation. Data are also protected digitally by three mirrored Network Operations Centers, which monitor both local and regional networks including: points of presence, telecom facilities, routers, servers, and customer's infrastructure. Data are backed up at different locations in the compound via replication services, and nightly hard copies are generated and stored in a secure location. Workstations located inside the compound do not allow for remote access and do not contain any third-party software.

DATA ANALYSIS

All data collected with Qulatrics will be exported into an Excel spreadsheet, and STATA 15 will be used to compare CL comfort and factors over time. Means and standard deviations will be used to understand data trends while analysis of variance (ANOVA) will be used to make direct comparison between subjects at the different study visits. Regression analysis will be used to understand factors associated with CL comfort and patient satisfaction.

INVESTIGATOR TRAINING

All study investigators will be required to read the protocol, and they will also undergo an in-person training run by Dr. Pucker before they will be certified to examine study subjects.

AUTHORSHIP

Named author (e.g., abstract, manuscript) will be required to meet at least two of the basic requirements of authorship, which include substantially contributing to study design, collecting data, and critically reviewing the results and publication. If an author does not meet any of the listed requirements, they will be excluded from the publication. If the investigator only meets one of the requirements, they will be acknowledged in the manuscript.

CONCLUSION

After completion of this study, the scientific and clinical communities will have a better understanding of the utility of using orthokeratology for the treatment of CLD. They will also have better insight into the neophyte orthokeratology wearer's initial experience with orthokeratology CLs. Overall, this knowledge will help guide practitioners who are attempting to treat CLD, and it will result in bettertargeted patient education for neophyte orthokeratology CL wearers.

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CONSENT FORM

Title of Research: Treating Contact Lens Discomfort with Orthokeratology

UAB IRB Protocol #: IRB-300001681

Principal Investigator: Andrew D. Pucker, OD, PhD

Sponsor: Euclid Systems

Purpose of the Research

We are asking you to take part in a research study on eye comfort. The purpose of this research is to investigate if orthokeratology (overnight hard contact lenses) is a good alternative to soft contact lenses for patients who are experiencing contact lens related discomfort. Orthokeratology is a FDA approved contact lens worn while you sleep that temporarily reshapes the front of your eye, so you can see well without contact lenses during the day. Given that contact lenses are a primary reason why people have uncomfortable eyes during the day, avoiding contact lenses while awake may eliminate the symptoms associated with contact lens. We plan to enroll 42 participants in this study.

Explanation of Procedures

Study visits:

You will arrive to at least 6 study visits. You will come for about five one-hour office visits over the period of one month (number of visits may vary based upon the contact lens fitting process). The sixth visit will be conducted either electronically or by phone and will last about 10 minutes.

- Visit #1: Baseline measurement
    - During this visit, your history and consent to be in the study will be obtained and your eligibility for the study will be determined. You will be asked to fill out four questionnaires (CLDEQ-8, University of Michigan Vision Correction Quality of Life, and SPEED Questionnaires, Study Specific Contact Lens Questionnaire). The following procedures will be performed: visual acuity, pupil size, manifest refraction, slit-lamp biomicroscopy, non-invasive break-up time, topography, tear meniscus height, phenol red thread, conjunctival staining, corneal esthesiometry, and contact lens fitting.
- Visit #2: Contact lens dispense
    - During this visit, your visual acuity will be obtained and your anterior eye health will be evaluated using slit-lamp biomicroscopy. The orthokeratology contact lenses will be dispensed and evaluated. Soft contact lens will also be evaluated for temporary use while vision is stabilizing with the orthokeratology contact lenses. You will be educated on how to properly use the contact lenses, including how to apply, remove and care for the contact lenses. If you are unable to safely apply and

remove your contact lenses, you will be rescheduled for an additional training session.

- Vistit#3: One-day follow-up
    - During this visit you will be asked to complete three questionnaires (CLDEQ-8 and SPEED Questionnaires, Study Specific Contact Lens Questionnaire). The following procedures will be performed: visual acuity, pupil size, manifest refraction, slit-lamp biomicroscopy, non-invasive break-up time, topography, tear meniscus height, phenol red thread, conjunctival staining, corneal esthesiometry, and contact lens evaluation. If the contact lens are not providing adequate vision or fit, you will be asked to return for additional visits until the vision and fit are adequate.
- Visit #4: One-week follow-up
    - During this visit you will be asked to complete three questionnaires (CLDEQ-8 and SPEED Questionnaires, Study Specific Contact Lens Questionnaire). The following procedures will be performed: visual acuity, pupil size, manifest refraction, slit-lamp biomicroscopy, non-invasive break-up time, topography, tear meniscus height, phenol red thread, conjunctival staining, corneal esthesiometry, and contact lens evaluation. If the contact lens fit does not provide adequate vision or fit, you will be asked to return for additional visits until the fit is adequate.
- Visit #5: One-month follow-up
    - During this visit you will be asked to complete four questionnaires (CLDEQ-8 and SPEED, University of Michigan Vision Correction Quality of Life Study Specific Contact Lens Questionnaire). The following procedures will be performed: visual acuity, pupil size, manifest refraction, slit-lamp biomicroscopy, non-invasive break-up time, topography, tear meniscus height, phenol red thread, conjunctival staining, corneal esthesiometry, and contact lens evaluation.
- Visit #6: Complete a survey electronically or through the phone at 3 months
    - During this visit you will be asked to complete four surveys (CLDEQ-8, University of Michigan Vision Correction Quality of Life, and SPEED Questionnaires, Study Specific Contact Lens Questionnaire) electronically. If you fail to complete the surveys electronically, you will be called to administer the survey over the phone.

The diagnostic procedures used in this protocol are those that make up a typical eye examination or a dry eye evaluation. If you agree to join the study, the following procedures will be performed.

- Eligibility determination: You will be asked to provide documentation of your most recent contact lens prescription (e.g., contact lens prescription, contact lens boxes). You will then be required to complete a questionnaire to show that your contact lenses are uncomfortable.
- Questionnaires: Questionnaires will be used to evaluate dry eye, health history, and contact lens history.
- Visual Acuity: Your ability to read the eye chart will be evaluated.
- Pupil Size: The side of your pupils will be measured with a millimeter ruler.
- Manifest Refraction: Your glasses prescription will be determined.
- Anterior Eye Health: Your eye heath will be evaluated with a slit-lamp biomicroscope.
- Tear Film: The quality of your tears will be evaluated with a topographer (camera) and a Phenol Red Thread (a special cotton thread that is placed on the lids to help with the diagnosis of dry eyes).

- Conjunctival Staining: Your eye's surface will be evaluated with a non-permanent green dye.
- Corneal Sensitivity: The sensitivity of your cornea will be evaluated with an esthesiometer (a device used to determine corneal sensitivity by adjusting the length of the nylon monofilament.
- Corneal Topography: The curvature of the front of your eye and your iris (colored part of eye) will be measured with a topographer (camera).
- Contact Lens Fitting: You will be fit with orthokeratology contact lenses and daily disposable soft contact lenses, which will only be used while you adjust to your orthokeratology contact lenses.
- Contact Lens Evaluation: The fit of your contact lenses will be monitored with a slit-lamp biomicroscope (an instrument that uses light and magnification to evaluate the eye) and a topographer.

Risks and Discomforts

This study does not involve any inherent discomforts. If you find any of the eye tests uncomfortable, you will be allowed to stop participation in the study. There is also a small risk of eye infection, which is present with all type of CL (~20/10,000 patient years for overnight use). If you develop an eye infection, you will be removed from the study and sent back to your eye care provider for treatment and all follow up care. There is also a risk of breach of confidentiality.

Information for Women of Childbearing Potential, Nursing Mothers, and/or Men Capable of Fathering a Child

Given hormonal chanes occur during childbearing, which can affect ocular comfort, this study is excluding any subjects who are pregnant or nursing at the time of study.

Benefits

You may not benefit directly from taking part in this study. However, you will have the opportunity to try orthokeratology contact lenses for free (free CLs that you can keep). Also, knowledge gained from this research will help the medical community better understand dry eye disease and if orthokeratology contact lenses can be used to avoid contact lens discomfort.

Alternatives

Your alternative is to not participate in this study. There are also possible alternatives to treating contact lens discomfort with orthokeratology, which include, but are not limited to daily disposable contact lenses, artificial tears/rewetting drops, and prescription dry eye medications.

Confidentiality

Information obtained about you for this study will be kept confidential to the extent allowed by law. However, research information that identifies you may be shared with people or organizations for quality assurance or data analysis, or with those responsible for ensuring compliance with laws and regulations related to research. They include:

- The UAB Institutional Review Board (IRB). An IRB is a group that reviews the study to protect the rights and welfare of research participants.
- Euclid Systems
- The Food and Drug Administration (FDA)
- The Office for Human Research Protections (OHRP)

The information from the research may be published for scientific purposes; however, your identity will not be given out. Your information may be used for future, undetermined research.

A description of this clinical trial will be available on http://www.ClinicalTrials.gov, as required by U.S. Law. This website will not include information that can identify you. At most, the website will include a summary of the results. You can search this website at any time.

Voluntary Participation and Withdrawal

Whether or not you take part in this study is your choice. There will be no penalty if you decide not to be in the study. If you decide not to be in the study, you will not lose any benefits you are otherwise owed.

You are free to withdraw from this research study at any time. Your choice to leave the study will not affect your relationship with this institution. However, you should return to see the study doctor for safety reasons, so you can be taken out of the study contact lenses and referred for follow-up care. Contact the study doctor if you want to withdraw from the study.

You may be removed from the study without your consent if the sponsor ends the study, if the study doctor decides it is not in the best interest of your health, or if you are not following the study rules.

If you are a UAB student or employee, taking part in this research is not a part of your UAB class work or duties. You can refuse to enroll, or withdraw after enrolling at any time before the study is over, with no effect on your class standing, grades, or job at UAB. You will not be offered or receive any special consideration if you take part in this research.

Cost of Participation

There will be no cost to you for taking part in this study. All materials, exams, and medical care related to this study will be provided to you at no cost during the 3-month study period.

Payment for Participation in Research

You will be paid $20/visit for a maximum of $120. A check will be mailed to the participant after each visit. Subjects will be required to complete the necessary tax document to receive their payments at their first visit.

Payment for Research-Related Injuries

UAB and Euclid Systems has not provided for any payment if you are harmed as a result of taking part in this study. If such harm occurs, treatment will be provided. However, this treatment will not be provided free of charge.

Significant New Findings

You will be told by the study doctor or the study staff if new information becomes available that might affect your choice to stay in the study.

Questions

If you have any questions, concerns, or complaints about the research or a research-related injury including available treatments, please contact the study doctor. You may contact Dr. Andrew D. Pucker at (205) 975-9938 or after hours by emailing him at apucker@uab.edu.
If you have questions about your rights as a research participant, or concerns or complaints about the research, you may contact the UAB Office of the IRB (OIRB) at (205) 934-3789 or toll free at 1-855-860-3789. Regular hours for the OIRB are 8:00 a.m. to 5:00 p.m. CT, Monday through Friday.

Legal Rights

You are not waiving any of your legal rights by signing this consent form.

Signatures

Your signature below indicates that you have read (or been read) the information provided above and agree to participate in this study. You will receive a copy of this signed consent form.

_____

Signature of Participant Date

_____

Signature of Person Obtaining Consent Date

University of Alabama at Birmingham

AUTHORIZATION FOR USE/DISCLOSURE OF PROTECTED HEALTH INFORMATION (PHI) FOR RESEARCH

Participant Name: _____
Research Protocol: Treating Contact Lens Discomfort with Orthokeratology

UAB IRB Protocol Number: IRB-300001681
Principal Investigator: Andrew D. Pucker, OD, PhD
Sponsor: Euclid Systems

What is the purpose of this form? You are being asked to sign this form so that UAB may use and release your protected health information for research. Participation in research is voluntary. If you choose to participate in the research, you must sign this form so that your protected health information may be used for the research.

Why do the researchers want my protected health information? The researchers want to use your protected health information as part of the research protocol listed above and as described to you in the informed consent.

What protected health information do the researchers want to use? All medical information, including but not limited to information and/or records of any diagnosis or treatment of disease or condition, which may include sexually transmitted diseases (e.g., HIV, etc.) or communicable diseases, drug/alcohol dependency, etc.; all personal identifiers, including but not limited to your name, social security number, medical record number, date of birth, dates of service, etc.; any past, present, and future history, examinations, laboratory results, imaging studies and reports and treatments of whatever kind, including but not limited to drug/alcohol treatment, psychiatric/psychological treatment; financial/billing information, including but not limited to copies of your medical bills, and any other information related to or collected for use in the research protocol, regardless of whether the information was collected for research or non-research (e.g., treatment) purposes.

Who will disclose, use and/or receive my protected health information? All Individuals/entities listed in the informed consent documents, including but not limited to, the physicians, nurses and staff and others performing services related to the research (whether at UAB or elsewhere); other operating units of UAB, HSF, UAB Highlands, Children's of Alabama, Eye Foundation Hospital, and the Jefferson County Department of Health, as necessary for their operations; the IRB and its staff; the sponsor of the research and its employees and agents, including any CRO; and any outside regulatory agencies, such as the Food and Drug Administration, providing oversight or performing other legal and/or regulatory functions for which access to participant information is required.

How will my protected health information be protected once it is given to others? Your protected health information that is given to the study sponsor will remain private to the extent possible, even though the study sponsor is not required to follow the federal privacy laws. However, once your information is given to other organizations that are not required to follow federal privacy laws, we cannot assure that the information will remain protected.

How long will this Authorization last? Your authorization for the uses and disclosures described in this Authorization does not have an expiration date.

Can I cancel this Authorization? You may cancel this Authorization at any time by notifying the Principal Investigator, in writing, referencing the research protocol and IRB Protocol Number. If you cancel this Authorization, the study doctor and staff will not use any new health information for research. However, researchers may continue to use the protected health information that was provided before you cancelled your authorization.

Can I see my protected health information? You have a right to request to see your protected health information. However, to ensure the scientific integrity of the research, you will not be able to review the research information until after the research protocol has been completed.

Signature of participant:_____ Date: _____
or participant's legally authorized representative:_____ Date: _____

Printed Name of participant's representative: _____
Relationship to the participant: _____