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CANADIAN JOURNAL OF OPTOMETRY | REVUE CANADIENNE D'OPTOMÉTRIE

VOL 72 NO 3 JUNE / JUIN 2010


# QUESTIONS ARE THE ANSWER | LES QUESTIONS SONT LA RÉPONSE

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# National Assessment – The Need for a Canadian Solution
# Examen national : le besoin d'une solution canadienne

BY / PAR KIRSTEN NORTH, OD, PRESIDENT CAO

"Labour mobility" refers to the freedom of workers to practice their occupation wherever opportunities exist. Every year, approximately 200,000 Canadians relocate to a different province or territory and look for work. The Agreement on Internal Trade (AIT), signed in 1994 by the Government of Canada and the provincial and territorial governments, makes it easier for people, investments, and services to move across Canada. The provisions of AIT impact all regulated professions including optometry.

In late 2009, the B.C. College of Optometrists determined that it would accept the American National Board Exam in Optometry (NBEO) as equivalent to the Canadian Standard Assessment in Optometry (CSAO) for applicants registering to practice optometry in B.C. This decision caused concern because applicants could apply to B.C. and use the mobility provisions of AIT to transfer their license to another province. Since the NBEO is written by U.S. optometry students and many in Canadian schools, there would be no incentive to write the CSAO.

It was suggested that this issue be discussed at the annual Optometric Leaders' Forum hosted by The Canadian Association of Optometrists (CAO). A special session was held on January 29, 2010 with presentations about the history of the AIT, the roles and responsibilities of the Canadian Examiners in Optometry (CEO) and the Canadian Optometric Regulatory Authorities (CORA). There was a review of models used by other professions and whether legal interpretations may offer clarity or other options. Those attending were challenged to answer the following questions:

- Is it necessary and/or realistic to have a standardized competency exam after graduation from an accredited school of optometry?
- If the answer is yes, then is it necessary and/or realistic that this be a Canadian exam?

The feedback showed considerable support for maintaining a Canadian entrance examination. Regrettably, the session did not find a solution to resolve the current inconsistent registration process. The B.C. College maintained its position and shortly after, the Alberta College of Optometrists decided to accept the NBEO as equivalent to the CSAO. The Canadian Examiners in Optometry is now planning its future, based on all possible scenarios.

CAO has a limited role in this matter. The licensing process is the responsibility of provincial regulatory bodies which originally founded the CEO to perform the role of national assessment.

The CAO has long supported the Canadian Examiners in Optometry and the CSAO. CAO Council revisited its position in July, 2009 and unanimously agreed that it supports a Canadian national, standardized competency examination after graduation from an accredited school of optometry. We urge the Canadian Examiners in Optometry and provincial regulatory bodies to work to this end. CAO members can assist in the process. Speak with your provincial college representatives and attend annual meetings. Take an active role in learning more and follow how this progresses and is ultimately resolved.

L'expression « mobilité de la main-d'œuvre » désigne la liberté des travailleurs d'exercer leur profession là où l'occasion est offerte. Chaque année, environ 200 000 Canadiens se réinstallent dans une autre province ou un autre territoire pour chercher du travail. Signé en 1994 par le gouvernement du Canada et les gouvernements des provinces et territoires, l'Accord sur le commerce intérieur (ACI) facilite les déplacements au Canada, qu'il s'agisse des gens, des investissements ou des services. Les dispositions de l'ACI touchent toutes les professions réglementées, dont l'optométrie.

À la fin de 2009, le Collège des optométristes de la C.-B. a décidé d'accepter l'examen national d'optométrie des États-Unis (NBEO) comme équivalent de l'Évaluation canadienne standardisée en optométrie (ÉCSO) pour toute personne demandant à exercer l'optométrie en Colombie-Britannique. Cette décision a soulevé des préoccupations parce que les requérants pouvaient présenter une demande en Colombie-Britannique et ensuite invoquer les dispositions de mobilité de l'ACI pour déménager dans une autre province. Étant donné que les étudiants en optométrie des États-Unis et beaucoup d'autres dans les écoles canadiennes se présentent à l'examen américain, il n'y aurait aucune incitation à se présenter à l'ÉCSO.

On a proposé que cette question soit abordée au Forum annuel des dirigeants optométriques qu'organise l'Association canadienne des optométristes (ACO). Une séance spéciale a donc eu lieu le 29 janvier 2010 et des exposés y ont été présentés sur l'historique de l'ACI, les rôles et les responsabilités des Examinateurs canadiens en optométrie (ECO) et des Autorités canadiennes de réglementation en optométrie (ACRO). Les participants ont aussi examiné les modèles utilisés par les autres professions et ils ont cherché à savoir si les interprétations juridiques étaient susceptibles d'offrir plus de clarté ou d'autres options. Les participants ont eu à répondre aux questions suivantes :

- Est-il nécessaire et/ou réaliste de faire subir un examen normalisé aux diplômés d'une école d'optométrie agréée?
- Dans l'affirmative, est-il nécessaire et/ou réaliste que ce soit un examen canadien?

Les commentaires reçus penchent en grande partie vers le maintien d'un examen d'entrée canadien. Malheureusement, les participants n'ont pas pu trouver une solution à l'incohérence du processus d'inscription actuel. Le Collège de la C.-B. est demeuré sur ses positions et, peu de temps après, le Collège des optométristes d'Alberta a lui aussi décidé d'accepter le NBEO comme équivalent de l'ÉCSO. Les Examinateurs canadiens en optométrie feront le point en se fondant sur tous les scénarios possibles.

L'ACO joue un rôle limité à cet égard. Le processus d'agrément relève des organismes de réglementation provinciaux qui ont, à l'origine, créé les ECO pour prendre en charge l'examen national.

L'ACO appuie depuis longtemps les Examinateurs canadiens en optométrie et l'ÉCSO. Le Conseil de l'ACO a réexaminé sa position en juillet 2009 et a décidé à l'unanimité de promouvoir un examen national canadien normalisé après la remise des diplômes d'une école d'optométrie agréée. Nous exhortons les Examinateurs canadiens en optométrie et les organismes de réglementation des provinces à faire de même. Les membres de l'ACO peuvent aider à cette fin. Rencontrez les représentants de votre ordre ou collège provincial et assistez aux assemblées annuelles. Jouez un rôle actif en vous informant davantage et en surveillant la façon dont cette question sera résolue en fin de compte.

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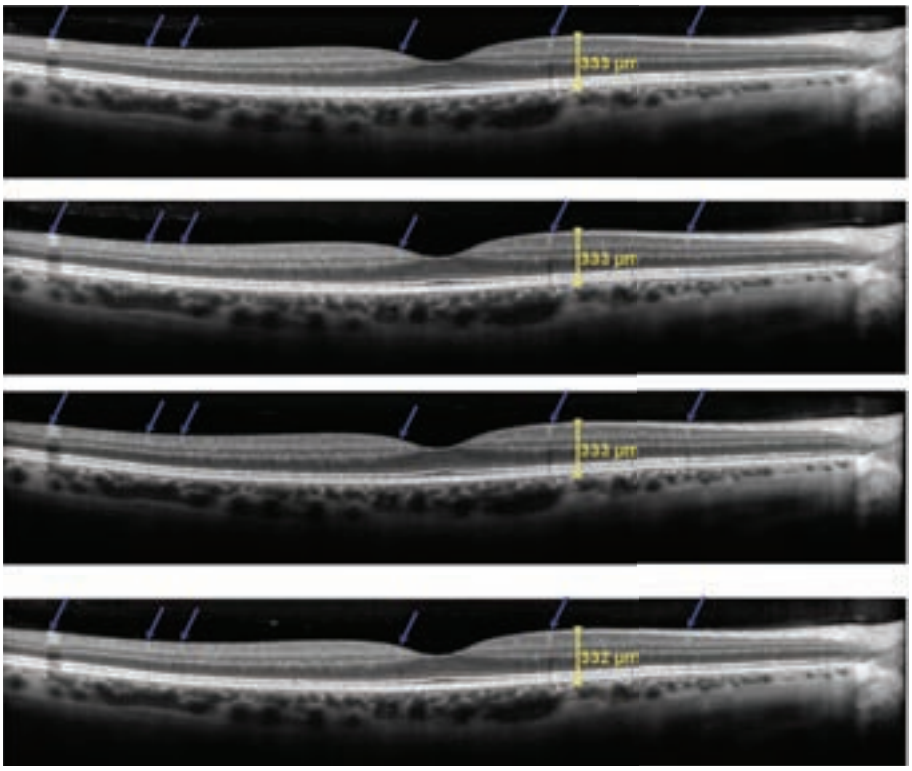

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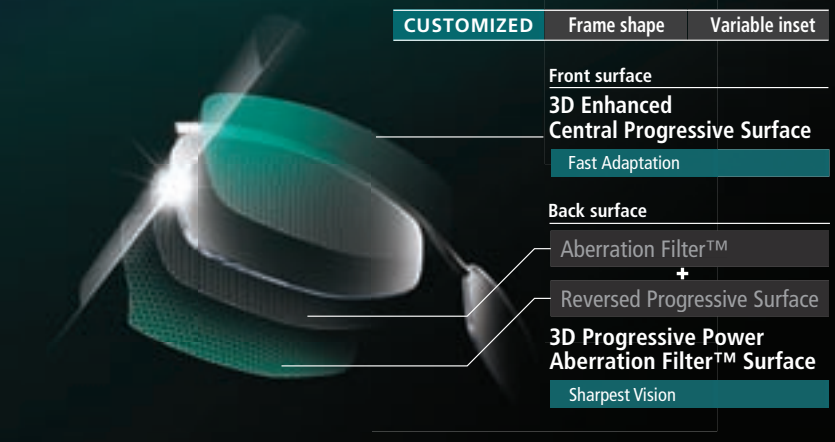


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# Questions are the Answer | Les questions sont la réponse

BY / PAR ALPHONSE CAREW, OD

The goal of any optometric exam is to identify the patient's visual needs and present clear and concise solutions to any problems. However, sometimes we fall short in delivering exemplary care when we focus solely on the patient's chief complaint as the exclusive reason for their visit. Often you need to dig deeper and determine all the needs of the patient!

A routine exam includes an in-depth case history and numerous procedures to diagnose disease and vision problems, but have you thought about how to best seek information from your patients that will identify other underlying issues – some of which they may not be aware? Many patients don't know what they need to know and won't realize there is a service, or a product that may be of help to them. It is your professional duty to discover these problem areas.

Sometimes, optometrists are shy about discussing issues that the patient hasn't first asked about, but it is important to acknowledge that you are not creating these problems. Your expertise lies in identifying them, offering expert solutions and then allowing the patient to consider all options that may provide relief or preventative care.

The key to identifying these underlying problems is to ask pertinent and probing questions. Take the example of proper UV protection with sunglasses. Nearly all of our patients could benefit from the preventive care offered by prescription (or non-prescription) sunglasses. Does your staff ask patients to bring their prescription sunglasses with them to the exam when calling to confirm their appointment? Even if they don't have any, it predisposes them to the idea that perhaps they should.

Do you ask the patient about their sunglasses as part of an intake form, or make it part of your case history? The simple question, "Do you have prescription sunglasses?" opens up the discussion about the importance of UV protection against cataracts and macular degeneration. Patients are very attuned to the harmful effects of the sun but often don't understand the harm it can do to their eyes. Without asking the right questions you may never uncover the patient's needs and ultimately provide the solution.

The use of probing questions allows you to bring awareness to issues that the patient may not have thought of, but that you deal with routinely. Family ocular history can be a great starting point. Those who have had family members with eye diseases are quicker to respond and want to hear more about the latest research as well as any preventative measures that can they can take to decrease their risk of getting the disease.

In the end, selling to your patient becomes a three-step process. First, ask questions that will identify vision or eye problems that your patient should be made aware of. Second, using your expert opinion, determine those that the patient needs to deal with. In a clear and concise manner you should have the patient understand why it is a need that they should look after. And lastly, tell them what solutions will satisfy those needs. Explain it in a way that will make them understand the benefits of your solutions. Mentioning progressive addition lenses as a solution to someone's visual needs is not as good as selling the benefit of getting their natural focus back so they can see both near and far as well as all points in between.

Keep in mind that patients aren't buying your products, but buying the product of your products. They are buying enhanced nighttime driving vision – not antiglare coating. They are buying more comfortable vision in bright conditions – not polarized lenses.

Don't present the products without presenting the benefit it brings.

Although there may be several different solutions available to satisfy the patients' needs, it is important that you decide which one you would recommend given their specific history and set of results. Giving many choices will only confuse your patients and ultimately end up decreasing the chances they will fulfil the recommendations you make. Patients see you for your expert recommendations, so give them clearly, concisely and with confidence.

If you have a desire to help your patients and believe that your services and products can satisfy their needs then you should feel comfortable in making strong solution recommendations. Don't only rely on the chief complaint for counselling but delve deeper to uncover all solutions to provide your patients with the best visual outcome possible.

Le but d'un examen optométrique est de déterminer les besoins visuels du patient et de présenter des solutions claires et concises à tous les problèmes. Toutefois, il nous arrive parfois de passer outre à des soins exemplaires parce que nous nous concentrons uniquement sur la plainte principale du patient, comme s'il s'agissait de la raison exclusive de sa visite. Nous devons souvent creuser pour déterminer tous les besoins du patient!

Un examen de routine comprend une observation approfondie des antécédents et plusieurs procédures servant à diagnostiquer des maladies et des problèmes de vision mais avez-vous réfléchi à la meilleure façon d'obtenir des renseignements de vos patients afin de déceler d'autres problèmes sous-jacents, même s'ils ne sont pas conscients de certains d'entre eux? Bien des patients ne savent pas ce qu'ils doivent savoir et ne réaliseront pas qu'un service ou un produit pourrait leur être utile. Il en va de votre devoir professionnel de découvrir les questions qui posent problème.

Parfois, les optométristes hésitent à discuter de questions que le patient n'a pas d'abord soulevées mais il est important que vous vous rendiez compte que vous ne créez pas ces problèmes. Votre expertise tient dans leur reconnaissance, la présentation de solutions d'experts et de toutes les possibilités que le patient pourrait envisager pour le soulager ou lui fournir des soins préventifs.

La clé de la détermination des problèmes sous-jacents consiste à poser des questions pertinentes et exploratoires. Prenons l'exemple d'une bonne protection contre les rayons UV grâce à des lunettes de soleil. Pratiquement tous nos patients pourraient profiter des soins préventifs que confèrent des lunettes de soleil sur ordonnance (ou sans ordonnance). Est-ce que votre personnel pose des questions pour que les patients apportent leurs lunettes de soleil sur ordonnance à l'examen lorsqu'il appelle pour confirmer un rendez-vous? Même si les patients n'en ont pas, cela les prédispose à l'idée qu'ils devraient peut-être en porter.

Posez-vous aux patients des questions sur leurs lunettes de soleil dans le formulaire d'accueil ou est-ce que cela fait partie de l'observation des antécédents? La simple question : « Avez-vous des lunettes de soleil sur ordonnance »? ouvre la voie à une discussion sur l'importance de la protection contre les rayons UV pour prévenir les cataractes et la dégénérescence maculaire. Les patients sont très au courant des effets nocifs du soleil mais ne comprennent souvent pas les dommages qu'ils peuvent causer à leurs yeux. Si vous ne posez pas les bonnes questions, il se pourrait que vous ne découvriez jamais les besoins des patients et, en bout de ligne, que vous ne leur donniez pas de solution.

Le recours à des questions exploratoires vous permet de faire ressortir des questions auxquelles le patient n'a peut-être pas songé mais que vous réglez couramment. L'observation des antécédents oculaires dans la famille peut être un excellent point de départ. Ceux dont certains membres de la famille ont eu une maladie oculaire réagissent plus rapidement et veulent en savoir plus sur les dernières recherches ainsi que sur les mesures préventives à suivre pour réduire le risque d'avoir cette maladie.

Au bout du compte, pour convaincre vos patients, vous devez suivre un processus en trois étapes. Premièrement, posez des questions qui permettent de repérer les problèmes oculaires ou de vision dont ils devraient être au

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ALREX® (loteprednol etabonate) Ophthalmic Solution 0.2% is indicated for temporary short-term relief of the signs and symptoms of seasonal allergic conjunctivitis.

Alrex® is for ophthalmic, short-term use only (up to 14 days). If Alrex® is used for 10 days or longer, intraocular pressure should be monitored.

Alrex® is contraindicated in suspected or confirmed infections of the eye: viral diseases of the cornea and conjunctiva including epithelial *herpes simplex* keratitis (dendritic keratitis), vaccinia, and varicella; untreated ocular infection of the eye; mycobacterial infection of the eye and fungal diseases of ocular structures; hypersensitivity to this drug or any ingredient in the formulation or container, or to other corticosteroids.

Reactions associated with ophthalmic steroids include elevated intraocular pressure, which may be associated with optic nerve damage, visual acuity and field defects, posterior subcapsular cataract formation, secondary ocular infection from pathogens including *herpes simplex*, and perforation of the globe where there is thinning of the cornea or sclera.

In clinical studies, adverse events related to loteprednol etabonate were generally mild to moderate, non-serious and did not interrupt continuation in the studies. The most frequent ocular event reported as related to therapy was increased IOP: 6% (77/1209) in patients receiving loteprednol etabonate, as compared to 3% (25/806) in the placebo treated patients.

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Pr Alrex®
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References: 1. ALREX Product Monograph, December 22, 2008

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# Pr Alrex®

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## Prescribing Summary

## Patient Selection Criteria

**THERAPEUTIC CLASSIFICATION**

Corticosteroid

**INDICATIONS AND CLINICAL USE**

Alrex® (loteprednol etabonate) Ophthalmic Suspension is indicated for temporary short-term relief of the signs and symptoms of seasonal allergic conjunctivitis

**CONTRAINDICATIONS**

Suspected or confirmed infection of the eye: viral diseases of the cornea and conjunctiva including epithelial herpes simplex keratitis (dendritic keratitis), vaccinia, and varicella; untreated ocular infection of the eye; mycobacterial infection of the eye and fungal diseases of ocular structures; hypersensitivity to this drug or any ingredient in the formulation or container, or to other corticosteroids.

**SPECIAL POPULATIONS**

**Use in Pediatrics (< 18 years of age):**

Alrex® should not be used in pediatric patients.

**Use in Geriatrics:**

Alrex® should not be used in geriatric patients. The safety and efficacy of Alrex® have not been established in patients > 65 years of age.

**Pregnant Women:**

Alrex® should not be used in pregnant women, unless the benefit clearly outweighs the risks. Studies in pregnant women have not been conducted.

**Nursing Women:**

Alrex® should not be used in lactating women, unless the benefit clearly outweighs the risks.

## Safety Information

**WARNINGS AND PRECAUTIONS**

**General**

For ophthalmic, short-term use only (up to 14 days).

The initial prescription and renewal of Alrex® should be made by a physician only after appropriate ophthalmologic examination is performed. If signs and symptoms fail to improve after two days, the patient should be re-evaluated. If Alrex® is used for 10 days or longer, intraocular pressure should be closely monitored.

Prolonged use of corticosteroids may result in cataract and/or glaucoma formation. Alrex® should not be used in the presence of glaucoma or elevated intraocular pressure, unless absolutely necessary and close ophthalmologic monitoring is undertaken. Extreme caution should be exercised, and duration of treatment should be kept as short as possible.

Alrex® should not be used in cases of existing (suspected or confirmed) ocular viral, fungal, or mycobacterial infections. Alrex® may suppress the host response and thus increase the hazard of secondary ocular infections. The use of Alrex® in patients with a history of herpes simplex requires great caution and close monitoring.

Alrex® contains benzalkonium chloride.

Alrex® has not been studied in pregnant or nursing women, but has been found to be teratogenic in animals. Alrex® should not be used in pregnant or nursing women unless the benefits clearly outweigh the risks.

**Carcinogenesis and Mutagenesis**

Long-term animal studies have not been conducted to evaluate the carcinogenic potential of loteprednol etabonate. Loteprednol etabonate was not genotoxic *in vitro* in the Ames test, the mouse lymphoma tk assay, or in a chromosome aberration test in human lymphocytes, or *in vivo* in the single dose mouse micronucleus assay.

**Ophthalmologic**

Alrex® should be used as a brief temporary treatment. If Alrex® is used for 10 days or longer, intraocular pressure should be closely monitored. The initial prescription and renewal of Alrex® should be made by a physician only after appropriate ophthalmologic examination is performed, ie. slit lamp biomicroscopy or fluorescein staining if appropriate. If signs and symptoms fail to improve after two days, the patient should be re-evaluated.

Prolonged use of corticosteroids may result in glaucoma with damage to the optic nerve, defects in visual acuity and fields of vision, and in posterior subcapsular cataract formation. Alrex® should not be used in the presence of glaucoma or elevated intraocular pressure, unless absolutely necessary and careful and close appropriate ophthalmologic monitoring (including intraocular pressure and lens clarity) is undertaken.

Corneal fungal infections are particularly prone to develop coincidentally with long-term local steroid application. Fungus invasion must be considered in any persistent corneal ulceration involving steroid use. Fungal cultures should be taken when appropriate.

Prolonged use of corticosteroids may suppress the host response and thus increase the hazard of secondary ocular infections. In those diseases causing thinning of the cornea or sclera, perforations have been known to occur with the use of topical steroids. In acute purulent conditions of the eye, steroids may mask infection or enhance existing infection.

Use of ocular steroids may prolong the course and may exacerbate the severity of many viral infections of the eye (including herpes simplex). Employment of a corticosteroid medication in the treatment of patients with a history of herpes simplex requires great caution.

Formulations with benzalkonium chloride should be used with caution in soft contact lens wearers.

**ADVERSE REACTIONS**

**Overview**

Reactions associated with ophthalmic steroids include elevated intraocular pressure, which may be associated with optic nerve damage, visual acuity and field defects, posterior subcapsular cataract formation, secondary ocular infection from pathogens including herpes simplex, and perforation of the globe where there is thinning of the cornea or sclera.

In nineteen clinical trials ranging from 1 to 42 days in length, 1,209 patients received various concentrations of loteprednol etabonate in topical ocular drops (0.005%, 0.05%, 0.1%, 0.2%, 0.5%). Adverse events related to loteprednol etabonate were generally mild to moderate, non-serious and did not interrupt continuation in the studies. The most frequent ocular event reported as related to therapy was increased IOP: 6% (77/1209) in patients receiving loteprednol etabonate, as compared to 3% (25/806) in the placebo treated patients.

With the exception of elevations in IOP, the incidence of events in the LE group was similar to, or less than that of the placebo control groups. Itching was reported as related to therapy in 3% of the loteprednol treated eyes, injection, epiphora, burning/stinging other than at instillation, foreign body sensation, and burning/stinging at instillation were each reported for 2% of eyes. The most frequent non-ocular event reported as related to therapy was headache, reported for 1.2% of the loteprednol treated subjects and 0.6% of the placebo treated subjects.

To report an adverse event, contact your Regional Adverse Reaction Monitoring Office at 1-866-234-2345 or Bausch & Lomb at 1-888-459-5000

## Administration

One drop instilled into the affected eye(s) four times daily for up to 14 days. If scheduled dose is missed, patient should be advised to wait until the next dose and then continue as before.

SHAKE VIGOROUSLY BEFORE USING. Alrex® should be stored upright between 15°–25°C for up to 28 days after first opening.

The preservative in Alrex®, benzalkonium chloride, may be absorbed by soft contact lenses, and can discolour soft contact lenses. Therefore, Alrex® should not be used while the patient is wearing soft contact lenses. Patients who wear soft contact lenses and whose eyes are not red should wait ten to fifteen minutes after instilling Alrex® before they insert their contact lenses.

Patients should be advised not to wear a contact lens if their eye is red. Alrex® should not be used to treat contact lens related irritation.

**SUPPLEMENTAL PRODUCT INFORMATION**

**WARNINGS AND PRECAUTIONS**

**Sexual Function/Reproduction**

The effects of Alrex® on sexual function and reproduction have not been studied in humans. Treatment of male and female rats with up to 50 mg/kg/day and 25 mg/kg/day of loteprednol etabonate, respectively, (1000 and 500 times the Alrex® clinical dose) prior to and during mating, was clearly harmful to the rats, but did not impair their copulation

performance and fertility (i.e., ability of female rats to become pregnant). However, these doses were highly toxic and had significant toxic effects on the pregnancies, and the survival and development of the offspring. Maternal toxicity, possible occurrence of abnormalities and growth retardation started at 10 times the Alrex® clinical dose.

**Neurologic**
Disturbances and suppression of the Hypothalamic-Pituitary-Adrenal (HPA) axis can occur with systemic exposure to corticosteroids. However, given the very low systemic exposure to loteprednol etabonate when using Alrex® as directed, these possible effects are not likely.

**Endocrine and Metabolism**
Glucocorticoids, mostly when systemic exposure occurs, decrease the hypoglycemic activity of insulin and oral hypoglycemics, so that a change in dose of the antidiabetic drugs may be necessitated. In high doses, glucocorticoids also decrease the response to somatotropin. The usual doses of mineralocorticoids and large doses of some glucocorticoids cause hypokalemia and may exaggerate the hypokalemic effects of thiazides and high-ceiling diuretics. In combination with amphotericin-B, they also may cause hypokalemia. Glucocorticoids appear to enhance the ulcerogenic effects of non-steroidal anti-inflammatory drugs. They decrease the plasma levels of salicylates, and salicylism may occur on discontinuing steroids. Glucocorticoids may increase or decrease the effects of prothrombopenic anticoagulants. Estrogens, phenobarbital, phenytoin and rifampin increase the metabolic clearance of adrenal steroids and hence necessitate dose adjustments.
However, given the very low systemic exposure to loteprednol etabonate when using Alrex® as directed, these possible effects are not likely.

**Immune**
Cortisol and the synthetic analogs of cortisol have the capacity to prevent or suppress the development of the local heat, redness, swelling, and tenderness by which inflammation is recognized. At the microscopic level, they inhibit not only the early phenomena of the inflammatory process (edema, fibrin deposition, capillary dilation, migration of leukocytes into the inflamed area, and phagocytic activity) but also the later manifestations, such as capillary proliferation, fibroblast proliferation, deposition of collagen, and, still later, cicatrisation.

**Clinical Trial Adverse Drug Reactions**
Possibly or probably related adverse events from two Phase III studies are listed below:

| | Alrex® 0.2% N = 133 | Placebo N = 135 |
|---|---|---|
| **SPECIAL SENSES (EYE DISORDERS)** | | |
| **Intraocular Pressure** | | |
| **- elevation of 6 to 9mm Hg*** | 2% to 12%* | 0% to 6%* |
| **- elevation of ≥10mm Hg** | 1 (1%) | 1 (1%) |
| **Chemosis** | 6 (5%) | 7 (5%) |
| **Vision, Abnormal or Blurred** | 4 (3%) | 5 (4%) |
| **Burning/Stinging, on instillation** | 3 (2%) | 6 (4%) |
| **Itching Eye** | 3 (2%) | 3 (2%) |
| **Dry Eye** | 2 (2%) | 4 (3%) |
| **Burning/Stinging, not on instillation** | 2 (2%) | 2 (1%) |
| **Epiphora** | 1 (1%) | 9 (7%) |
| **Discharge** | 1 (1%) | 3 (2%) |
| **Foreign Body Sensation** | 1 (1%) | 1 (1%) |
| **Discomfort Eye** | 1 (1%) | 0 (0%) |
| **Injection** | 1 (1%) | 0 (0%) |
| **Eye Pain** | 1 (1%) | 0 (0%) |
| **Sticky Eye** | 0 (0%) | 7 (5%) |
| **Erythema Eyelids** | 0 (0%) | 2 (1%) |
| **Eye Disorder** | 0 (0%) | 2 (1%) |
| **BODY AS A WHOLE** | | |
| **Face Edema (Head)** | 1 (1%) | 0 (0%) |
| **Allergic Reaction** | 1 (1%) | 0 (0%) |
| **MUSCULOSKELETAL SYSTEM** | | |
| **Twitching** | 0 (0%) | 1 (1%) |

* for IOP increase of 6 to 9 mm Hg, please see below

One patient in the Alrex® group and one patient in the placebo group experienced increases in IOP of ≥10 mm Hg. Among these, one in each group had an IOP increase of ≥15 mm Hg, reaching IOP values over 30 mm Hg.
In both studies, there were more patients with IOP increases of 6 to 9 mm Hg in the Alrex® group than in the placebo group (see table below). In study A, among the patients with IOP increases of 6 to 9 mm Hg, four reached an IOP value of 22 to 23 mm Hg, and one patient reached 29 mm Hg and was discontinued (clinically significant increase in IOP). All these five patients were from the Alrex® groups.

**Incidence of IOP increases of 6 to 9 mm Hg from baseline**
(number of patients and percentages)

| | Duration of treatment | | |
|---|---|---|---|
| | Day 7 | Day 14 | Day 28 |
| **Alrex®** | | | |
| Study-A | 6 (9%) | 6 (9%) | 8 (12%) |
| Study-B | 3 (5%) | 1 (2%) | 4 (6%) |
| **Placebo** | | | |
| Study-A | 0 (0%) | 4 (6%) | 1 (2%) |
| Study-B | 0 (%) | 0 (%) | 0 (%) |

Due to the sample size for each arm of the two phase III studies in SAC, all events captured are greater than 1% of n.

**SYMPTOMS AND TREATMENT OF OVERDOSAGE**
For management of suspected accidental oral ingestion or drug overdose, consult your regional poison control centre. No cases of overdose have been reported.
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courant. Deuxièmement, grâce à votre opinion d'experts, déterminez ceux qu'ils devraient régler. De manière claire et concise, vous devriez leur faire comprendre pourquoi il s'agit d'un besoin auquel ils devraient faire face. Troisièmement, dites-leur quelles solutions satisferont ces besoins. Donnez des explications de manière à ce qu'ils comprennent les avantages de vos solutions. Mentionner les verres à foyer progressif comme solution aux besoins visuels d'une personne n'est pas aussi bon que de faire valoir l'avantage de recouvrer leur focalisation naturelle de manière à pouvoir voir de près et de loin ainsi qu'entre les deux.

N'oubliez pas que les patients n'achètent pas vos produits mais bien le produit de vos produits. Ils achètent une vision améliorée pour la conduite de nuit et non une couche antireflets. Ils achètent une vision plus confortable sous bonne clarté et non des verres polarisés. Ne présentez pas de produits sans présenter les avantages qu'ils apportent.

Même si plusieurs solutions peuvent répondre aux besoins des patients, il est important que vous décidiez laquelle recommander en fonction de leurs antécédents particuliers et de l'ensemble des résultats souhaités. Donner beaucoup de choix ne fait que désorienter vos patients et finit par réduire les chances qu'ils suivent vos recommandations. Puisqu'ils vous consultent pour obtenir vos recommandations d'experts, faites-les de manière claire, concise et avec confiance.

Si vous désirez aider vos patients et croyez que vos services et produits peuvent satisfaire leurs besoins, vous ne devriez pas hésiter à recommander vivement des solutions. Ne vous fiez pas uniquement à la plainte principale pour donner des conseils mais creusez pour découvrir toutes les solutions et offrir à vos patients le meilleur résultat visuel qui soit.

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# Leading the Way in Contact Lens Education

At the annual Association of Optometric Contact Lens Educators (AOCLE) workshop, hosted by the University of Alabama, June 3-6, Dr. Langis Michaud (University of Montreal) was awarded the Lester Janoff Memorial Award, for his demonstation of excellence in the area of contact lens education, reasearch, and publications.

Dr. Etty Bitton (right) is presented a plaque in appreciation for her dedicated service as Chair of the AOCLE, (2008-2010), by the incoming chair, Dr. Vinita Henry.

AOCLE is a non-profit organization of all the contact lens educators in the North American Schools and Colleges of Optometry (U.S., Canada and Puerto Rico). Its purpose is to provide a forum for exchange of information and communication.

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# Vision, neurosciences et réadaptation
# Vision, Neuroscience and Rehabilitation

## LA SEPTIÈME JOURNÉE SCIENTIFIQUE DE L'ÉCOLE D'OPTOMÉTRIE
## THE SCHOOL OF OPTOMETRY'S 7TH SCIENCE DAY

PAR/ BY CLAUDE J GIASSON, OD, PH.D., CHRISTIAN CASANOVA, PH.D.

L'École d'optométrie de l'Université de Montréal a tenu le 19 mars dernier sa septième journée scientifique. Sous le thème, *Vision, Neurosciences et Réadaptation*, cette journée était organisée conjointement avec le Groupe de Recherche en Sciences de la Vision (GRSV). Ce groupe comprend en plus du noyau de professeurs de l'École d'optométrie, des chercheurs des unités de pédiatrie, pathologie et biologie cellulaire, psychologie, kinésiologie et de génie biomédical de l'Université de Montréal ainsi que du département d'ophtalmologie de l'Université McGill.

Le conférencier invité, Gislin Dagnelie, est professeur agrégé en Ophtalmologie à la faculté de Médecine de l'Université Johns Hopkins et le directeur adjoint du Lions Vision Research and Rehabilitation Center, une division du Wilmer Eye Institute. Le Dr Dagnelie est le chercheur principal des essais cliniques des prothèses

Discussion entre étudiants devant une affiche dans le hall d'honneur de l'Université de Montréal / Discussion among students in front of a poster in the University of Montreal hall of honour

Optobionics (2004 - 2007) et Second Sight Argus 2 (2007 - présent). Le Dr Dagnelie est aussi le chercheur principal d'études, financées par le National Eye Institute, visant à convertir les micro-ordinateurs personnels en outils précis d'évaluation de la fonction visuelle.

Sa conférence avait pour titre, *Recreating sight in end-stage retinitis pigmentosa patients with retinal implants: a report from the trenches*. En guise d'introduction à sa présentation, le professeur Dagnelie a fait état des développements européennes, américaines et japonaises centrées sur l'élaboration d'une

Conférencier invité de la journée, le Dr Gislin Dagnelie / Guest speaker of the day, Dr. Gislin Dagnelie

prothèse visuelle, destinée à générer une perception visuelle artificielle chez des individus aveugles. En se substituant aux éléments endommagés des voies visuelles, une telle prothèse visuelle s'interface avec les structures intactes des voies visuelles, rappelle le professeur Dagnelie, afin de fournir une perception visuelle limitée, mais idéalement suffisante pour que l'handicapé puisse lire, reconnaître les visages et se déplacer dans des espaces non familiers.

Ces équipes de chercheurs ont conçu des prothèses permettant de stimuler la rétine, le nerf optique ou le cortex visuel. Le choix de l'un ou de l'autre de ces types de prothèse dépend du site de la lésion responsable de la cécité. Ces chercheurs s'entendent sur un point, poursuit le professeur Dagnelie : une neuroprothèse sensorielle devrait accéder au site le plus périphérique qui soit proximal à la région lésée. Les sites périphériques, rappelle-t-il, sont en général non seulement plus accessibles, mais l'organisation des structures neurales périphériques est mieux comprise que celle des structures centrales, ce qui facilite la stimulation spatiale. De plus, les sites périphériques pourraient utiliser la capacité des zones plus centrales de traiter le signal, simplifiant les opérations de traitement entre la caméra échantillonnant l'environnement visuel et les électrodes rétiniennes de stimulation. Le type de prothèse retenu par l'équipe du professeur Dagnelie, l'implant rétinien, nécessite des mécanismes fonctionnels de conduction nerveuse de la rétine jusqu'au structures centrales de la vision. Ce type de prothèse peut-être utilisé chez des personnes souffrant de rétinopathie pigmentaire puisque la perte des photorécepteurs chez des gens atteints de cette pathologie n'affecte pas le réseau de neurones, mais le prive de stimulation. L'implant rétinien permet de fournir cette stimulation électrique aux cellules ganglionnaires qui les transmettront par le réseau neuronal jusqu'au cerveau par le nerf optique et les voies optiques. Cette stimulation permet de produire chez les patients atteints de cécité une *sensation visuelle*. Un tel implant rétinien peut être épi-rétinien ou sous-rétinien selon la position où il a été placé lors de la chirurgie: à la surface de la rétine du côté des cellules ganglionnaires, au niveau du nerf optique ou encore sous la rétine à la place des photorécepteurs.

L'équipe du professeur Dagnelie a implanté une prothèse épi-rétinienne destinée à des personnes non voyantes suite à une rétinopathie pigmentaire. Cet implant qui comporte 16 microélectrodes est connecté à un récepteur et relié à une caméra fixée sur des lunettes. Les images captées par la caméra sont simplifiées et traduites sous forme d'impulsions électriques qui sont ensuite transmises à l'implant. Celui-ci les achemine ensuite aux cellules ganglionnaires, suscitant une activité dans le nerf optique et les aires visuelles du cerveau. Cela se traduit par l'apparition d'un phosphène, ou sensation de taches lumineuses de 16 pixels dans le champ visuel.

Au cours des dernières années, six patients, atteints de rétinopathie pigmentaire, se sont portés volontaires pour l'implantation d'une telle prothèse. Après un apprentissage, des tests perceptifs ont été conduits par l'équipe du professeur Dagnelie. Suite à une stimulation, les sujets notaient l'apparition de phosphènes dans leur champ visuel. Ils pouvaient suivre le mouvement d'une source lumineuse et identifier un objet simple et le saisir. Au cours des cinq années d'étude, les sujets ont, par ailleurs, toléré l'implant sans qu'aucune détérioration ne soit observée dans les tissus adjacents.

L'obstacle le plus important demeure la quantité limitée de pixels de l'image produite : la résolution spatiale demeure insuffisante pour permettre une vision détaillé des objets. Il faudrait donc augmenter la résolution individuelle des électrodes afin d'insérer sur une surface maximale de 3 à 6 mm$^2$ au moins 600 points de stimulation (l'équivalent d'une image de 25 x 25 pixels), le seuil minimal nécessaire à la lecture d'un texte. La reconnaissance des visages exigerait pour sa part au moins 1 000 points de stimulation. Gislin Dagnelie reconnait qu'il faudra attendre plusieurs années avant la mise au point d'une prothèse visuelle utilisable dans la vie de tous les jours.

Deux autres conférences ont été données par des professeurs de l'École d'optométrie. Caroline Faucher, professeur adjoint à l'École d'optométrie a présenté une communication, *Explicitation du raisonnement clinique chez des optométristes de deux niveaux d'expertise professionnelle contrastants*. Son travail de recherche au cours d'un doctorat de 3ème cycle en éducation a étudié et comparé le raisonnement clinique d'optométristes de niveaux compétent et expert, afin de définir les attributs de l'expertise. Sa conclusion : *l'expert planifie mieux, le cas clinique dès le début de l'examen, et construit une stratégie de traitement ou de suivi.* Cette tentative de définir le raisonnement clinique expert aura sans doute un impact important dans la formation de cette compétence des générations d'optométristes à venir. Quant à lui, Guillaume Giraudet, professeur associé et chercheur au laboratoire de Psychophysique et Perception Visuelle du professeur Jocelyn Faubert a présenté une conférence intitulée : *Les myopes et les emmétropes perçoivent-ils des scènes floues de la même façon?* Selon ses travaux, les myopes présentent des aptitudes particulières à analyser/exploiter les basses fréquences spatiales de leur environnement visuel. En conséquence, les erreurs de réfraction des sujets d'expériences psychophysiques devraient constituer un élément de sélection ou de contrôle, de la population participant à des expériences dans lesquelles le contenu en fréquences spatiales des stimuli visuels est manipulé.

Les neuf autres conférences et 30 affiches au programme de la journée ont été présentées par des étudiants en optométrie ou des étudiants gradués. Les tableaux 1, 2 et 3 énumèrent ces présentations selon qu'il s'agit d'une conférence ou d'une affiche présentée par un étudiant gradué ou par un étudiant de premier cycle en optométrie.

Cet évènement a été rendu possible grâce à la généreuse contribution des sociétés ou organisations suivantes : Novartis, la Banque Nationale, la caisse Desjardins des Versants-du-Mont-Royal, le Réseau FRSQ de Recherche en Santé de la Vision du Québec et le Groupe de Recherche en Sciences de la Vision (GRSV). De plus, la générosité des commanditaires a permis de distribuer des prix à neuf étudiants pour l'excellence de leur travail. La sélection des gagnants a été exécutée par consensus auprès de différents jurys pour chaque catégorie d'étudiants, sauf dans le cas du prix du public qui était décerné

à la présentation recueillant le plus de noix de l'auditoire.

Léa Gagnon, étudiante à la maîtrise; s'est méritée le prix Réseau FRSQ de Recherche en Santé de la Vision pour sa conférence : *Neural Correlates of Tactile Maze Solving in Congenitally Blind Subjects*. Les prix du Groupe de Recherche en Sciences de la Vision ont été gagnés par des étudiantes au doctorat (Ph.D.) : Marie-Eve Laramée pour la meilleure communication scientifique, Dendroarchitecture des neurones corticaux projetant vers l'aire visuelle primaire chez la souris et Valentina Vucéa pour la meilleure présentation par affiche. Son affiche avait pour titre: « *Modélisation de la fonction de la réflectométrie pour les vaisseaux sanguins de l'œil* ». Le prix de la Caisse Desjardins des Versants du Mont-Royal pour la meilleure affiche de recherche clinique (doctorat en optométrie, OD) a été remis à Elior Sandroussy et Maxime Théroux-Soucy pour leur présentation *Variation du patron d'arborisation lacrymale avec l'utilisation de larmes artificielles chez des patients souffrant de sécheresse oculaire*; le prix d'excellence de la Banque Nationale pour la meilleure affiche scientifique, catégorie premier cycle en optométrie a été remporté par Marie-Eve Simard et Kathrine Gaboury pour leur présentation intitulée, *Comparaison entre trois échelles de mesure d'acuité visuelle chez des sujets avec amblyopie unilatérale*; enfin, le prix du public de l'École pour la présentation recueillant le plus de suffrage a été accordé à Patricia Sorya et Mohamed Asfour pour leur affiche intitulée, Influence du diamètre pupillaire sur la mesure de l'épaisseur de la couche de fibres nerveuses péripapillaires au GDxVcc.

## TABLEAU / TABLE 1

COMMUNICATIONS ORALES RÉALISÉES PAR DES ÉTUDIANTS GRADUÉS / ORAL PRESENTATIONS BY GRADUATE STUDENTS

| Titre de la présentation / Presentation title | Étudiant / Student |
|---|---|
| A. La variation du taux d'oxyhémoglobine du sang dans les structures micro-capillaires de l'oeil durant la période d'un cycle menstruel / Variation in the oxyhemoglobin levels in the blood in the micro-capillary structures of the eye during one menstrual cycle | Jessy Hilal (MSc) |
| B. Galantamine promotes structural and functional neuroprotection in glaucoma via activation of muscarinic, but not nicotinic, acetylcholine receptors | Mohammadali Almasieh (PhD) |
| C. Neural correlates of biased competition between response options in dorsal premotor cortex Alexandre | Pastor Bernier (PhD) |
| D. Neural Correlates of Tactile Maze Solving in Congenitally Blind Subjects | Léa Gagnon (MSc) |
| E. Expression et localisation du récepteur cannabinoïde CB1 (CB1R) dans la rétine du singe Vervet (Chlorocebus sabeus) / Expression and location of the CB1 cannabinoid receptor (CB1R) in the retina of a Vervet monkey (Chlorocebus sabeus) | Joseph Bouskila (MSc) |
| F. Dendroarchitecture des neurones corticaux projetant vers l'aire visuelle primaire chez la souris / Dendro-architecture of the cortical neurons pointing to the primary visual area in mice | Marie-Ève Laramée (PhD) |
| G. The role of cannabinoid receptors type 1 and 2 in the retinal function of adult mice | Nawal Zabouri (PhD) |
| H. Dès le cortex visuel, la fréquence spatiale change après une adaptation: plasticité et « trace mnésique » aux neurones de l'aire 17 / From the visual cortex, the spatial frequency changes after adaptation: plasticity and "neural engram" in the neurons of area 17 | Sergueï Marchansky (MSc) |
| I. Le « knock-down » ciblé de ASPP1 et ASPP2, des activateurs de p53, retarde la mort de cellules rétiniennes ganglionnaires in vivo / The targeted knock-down of ASPP1 and ASPP2, of the p53 activators delays the death of retinal cells in vivo. | Ariel M. Wilson (PhD) |

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## TABLEAU / TABLE 2

AFFICHES RÉALISÉES PAR DES ÉTUDIANTS GRADUÉS / POSTERS DONE BY GRADUATE STUDENTS

| Titre de la présentation | Étudiant |
|---|---|
| 1. Mise en évidence de l'organisation fonctionnelle du cortex visuel du toupaye (Tree Shrew) par imagerie optique / Highlighting the functional organization of the visual cortex of the tree shrew through optical imaging | Matthieu Vanni (PhD) |
| 2. A new avenue for image analysis based on the Fourier decomposition of acquired signals : Application on in vivo optical imaging of the visual cortex | M Vanni (PhD) |
| 3. Impact des récepteurs CB1 aux endocannabinoïdes sur l'organisation fonctionnelle du cortex visuel primaire / Impact of CB1 endocannabinoid receptors on the functional organization of the primary visual cortex | Matthieu Vanni (PhD) |
| 4. Fast micromirror based laminar optical tomography | Samuel Bélanger (PhD) |
| 5. Régulation de l'oxygénation des artères et veines rétiniennes en situation d'hypoxie / Oxygenation regulation of the retinal arteries and veins during hypoxemia | Pierre-Jean Bernard (PhD) |
| 6. L'administration topique de l'antagoniste du récepteur B1 des kinines FV 60135 02 inhibe l'inflammation de la rétine chez le rat diabétique / Topical administration of kinin B1 receptor antagonist FV-60135-02 inhibits retinal inflammation in diabetic rats | Mylène Pouliot (PhD) |
| 7. Does Increasing Retinal Metabolism With Dark Rearing Protect From Postnatal Hyperoxia | M. Djavari (MSc) |
| 8. Cholinergic system activation paired with visual stimulation enhances visual performance of rats in the visual water maze | Jun Il Kang (PhD) |
| 9. Mild Cognitive Impairment and Vision Loss Correlation on the Montreal Cognitive Assessment (MoCA) Scale | Nathalie Duponsel (MSc) |
| 10. Modélisation de la fonction de la réflectométrie pour les vaisseaux sanguins de l'œil / Modeling the reflectometry function for blood vessels in the eye | Valentina Vucea (PhD) |
| 11. Étude du débit sanguin rétinien chez le rat par Débimétrie au laser par effet Doppler (LDF) / Study of retinal blood flow in rats through laser Doppler flowmetry (LDF) | Simon Hétu (MSc) |

## TABLEAU / TABLE 3

PRÉSENTATIONS RÉALISÉES PAR DES ÉTUDIANTS DE QUATRIÈME ANNÉE EN OPTOMÉTRIE / PRESENTATIONS GIVEN BY 4TH YEAR OPTOMETRY STUDENTS

| Titre de la présentation | Étudiants |
|---|---|
| J. 15h15 L'absence d'un des photopigments de cônes, coupe la capacité du sujet à percevoir la couleur jaune / J. 3:15 p.m. Absence of one of the cone photopigments reduces the subject's ability to perceive the colour yellow | G Fanous |
| 12. Visualisation des neurones cérébraux activés par une stimulation visuelle et leur modulation par l'acétylcholine chez le rat / Viewing the cerebral neurons activated by visual stimulation and modulating them through acetylcholine in rats | A Tang, L Timmer |

| | |
|---|---|
| 13. Variation de la saturation d'oxygène et du calibre des vaisseaux sanguins de la rétine entre des sujets emmétropes et forts myopes / Difference in oxygen saturation and size of the retinal blood vessels between emmetropic and highly myopic subjects | A Masella, D Pépin |
| 14. Les taches cognitives influencent différemment la réponse posturale avec un stimulus visuel chez des sujets jeunes ou âgés / Cognitive tasks differently affect postural response with a visual stimulus in young or old subjects | R Soowamber, P T-Lavallée |
| 15. Résistance à la chaleur des traitements antireflets dernière génération / Heat resistance of last-generation anti-glare treatments | Y Michaud, F N-Gaudreault |
| 16. Comparaison des tests de stéréopsie Frisby© et TNO© chez des sujets avec amblyopie anisométropique, avec microstrabime et un groupe contrôle / Comparison of the Frisby© and TNO© stereopsis tests in subjects with anisometropic amblyopia, with microstrabismus and a control group | K Bobadova, M Fakhfakh, R Makhlouf |
| 17. Comparaison entre trois échelles de mesure d'acuité visuelle chez des sujets avec amblyopie unilatérale / Comparison among three scales for measuring visual acuity in subjects with unilateral amblyopia | K Gaboury, M-E Simard |
| 18. Influence du diamètre pupillaire sur la mesure de l'épaisseur de la couche de fibres nerveuses péripapillaires au GDxVcc / Influence of pupil diameter on measuring the thickness of the layer of peripapillary nerve fibres with the GDxVcc | M Asfour, P Sorya |
| 19. Influence du retrait de lentilles cornéennes sur la mesure de l'épaisseur des fibres nerveuses rétiniennes par polarimétrie au laser par balayage (GDx) / Effect of removing the corneal lenses on measuring the thickness of retinal nerve fibres using (gdx) scanning laser polarimetry | J Guimond, ATon Tran |
| 20. Le système endocannabinoïde module le développement du nerf optique / The endocannabinoid system modulates the development of the optic nerve | N Tea |
| 21. Performance des traitements antirayures sur les visières de hockey / Performance of anti-scratch treatments on hockey visors | LP B-Bastien, J Godin |
| 22. Indication d'iridotomie d'après le volume de la chambre antérieure mesuré avec le Pentacam / Indication of iridotomy based on the volume of the anterior chamber measured with the Pentacam | S Chiasson, A Leroy |
| 23. Variation du patron d'arborisation lacrymale avec l'utilisation de larmes artificielles chez des patients souffrant de sécheresse oculaire / Variation in the lacrymal arborization pattern with the use of artificial tears in patients with ocular dryness | E Sandroussy, M T-Soucy |
| 24. Étude sur les motifs de choix des patients entre l'hôpital et une clinique privé pour leur chirurgie de cataracte / Study on patients' reasons for selecting between the hospital and a private clinic for their cataract surgery | C Boisjoly, MC Lanthier |
| 25. Comparaison du rendement de deux loupes éclairantes sur pied (incandescente vs DEL) dans une population atteinte de dégénérescence maculaire liée à l'âge (DMLA) suivie en basse vision / Comparison of the performance of two light scopes on a stand (incandescent vs. LED) in a population with age-related macular degeneration (ARMD) followed by low vision | L-A -Jacques, I Leclerc |
| 26. Étude sur la comparaison de la teneur protéique dans des extraits provenant de lentilles Acuvue 2 et Oasys portées durant 24 heures / Study on comparing the protein content in extracts from Acuvue 2 and Oasys lenses worn for 24 hours | S Campbell, C Duhamel |
| 27. Étude comparative du montant de protéines adsorbées à la surface de 3 lentilles HEMASilicone / Comparative study of amount of proteins adsorbed on the surface of 3 HEMASilicone lenses | A Weisbeck, Pelletier |

| | |
|---|---|
| 28.Étude comparative de l'acuité visuelle mesurée avec deux échelles de vision de loinet deux échelles de vision de près chez des patients de basse vision atteints de dégénérescence maculaire liée à l'âge (DMLA) / Comparative study of visual acuity measured with two distance vision scales and two close-up vision scales in patients with low vision who have age-related macular degeneration (ARMD) | J Bender, J Ducharme, M Faust, V Lavoie |
| 29. Efficacité des lentilles intraoculaires multifocales, ReSTORTM, et Tecnis MFTM : étude comparative / Effectiveness of multifocal intra-ocular lenses, ReSTORTM, and Tecnis MFTM: comparative study | S Coppola, K Loyer |

On March 19, the University of Montreal's School of Optometry held its 7th Science Day. Under the theme of *Vision, Neuro-science and Rehabilitation*, the day was organized jointly with the Groupe de Recherche en Sciences de la Vision (GRSV). This group consists of the core professors from the School of Optometry, researchers from the University of Montreal's pediatric, cell pathology and biology, psychology, kinesiology and biomedical engineering units as well as the University of McGill's department of ophthalmology.

The guest speaker, Gislin Dagnelie, is associate professor in ophthalmology at the Faculty of Medicine of Johns Hopkins University and assistant director of the Lions Vision Research and Rehabilitation Center, a division of the Wilmer Eye Institute. Dr. Dagnelie is the lead researcher of the clinical trials for the prosthetics Optobionics (2004-2007) and Second Sight Argus 2 (2007 - present). Dr. Dagnelie is also the lead researcher of studies funded by the National Eye Institute, for converting personal computers into accurate tools for assessing visual function.

The title of his speech was, *Recreating sight in end-stage retinitis pigmentosa patients with retinal implants: a report from the trenches*. By way of an introduction to his presentation, Professor Dagnelie reported on European, American and Japanese experiments focussed on developing a visual prosthesis intended to generate artificial visual perception in blind people. By standing in for the damaged parts of the visual pathways, this kind of visual prosthetic, interfaces with the intact structures of the visual pathways, in order to provide visual perception that is limited, yet ideally enough so that the disabled person can read, recognize faces and get around in unfamiliar places, explains Professor Dagnelie.

These research teams have designed prostheses that can stimulate the retina, optic nerve or visual cortex. Choosing one of these types of prosthesis depends on the site of the injury responsible for blindness. These researchers agree on one thing, continued Professor Dagnelie: a sensory neuroprosthesis should access the most peripheral site near the injured area. The peripheral sites, he recalls, are not only more accessible in general, but the organization of the peripheral neural structures is better understood than that of the central structures, which facilitates spatial stimulation. Moreover, the peripheral sites could use the ability of the more central zones for processing the signal, thereby simplifying the processing operations between the camera that samples the visual environment and the retinal stimulation electrodes. The type of prosthesis chosen by Professor Dagnelie's team, the retinal implant, requires the functional nerve conduction mechanisms

of the retina as far as the central structures of vision. This type of prosthesis could be used for people with retinitis pigmentosa since the loss of photoreceptors in people with this disease does not affect the neuron network, but deprives it of stimulation. The retinal implant provides this electrical stimulation to the ganglion cells, which transmit them through the neuron network to the brain via the optic nerve and visual pathways. This stimulation helps produce a "visual sensation" in blind patients. A retinal implant of this kind can be epi-retinal or sub-retinal depending on where it is placed during surgery: on the surface of the retina beside the ganglion cells, at the optic nerve, or under the retina in place of the photoreceptors.

Professor Dagnelie's team implanted an epi-retinal prosthesis intended for blind people following retinitis pigmentosa. This implant has 16 micro-electrodes and is connected to a receiver and hooked up to a camera attached to the person's glasses. The images captured by the camera are simplified and converted into electrical impulses that are then transmitted to the implant. The implant then forwards them to the ganglion cells, producing activity in the optic nerve and the visual areas of the brain. This results in the appearance of a phosphene, or sensation of light spots measuring 16 pixels in the visual field.

Over the past few years, six patients with retinitis pigmentosa volunteered to have this type of prosthesis implanted. After training, perception tests were conducted by Professor Dagnelie's team. Following stimulation, the subjects noticed the appearance of phosphenes in their visual field. They could track the movement of a light source and identify a simple object and grasp it. During the five years of the study, the subjects also tolerated the implant with no deterioration seen in the adjacent tissues.

The biggest obstacle remains the limited quantity of pixels of the image produced: the spatial resolution remains inadequate for allowing detailed vision of objects. Therefore, what needs to be done is to increase the individual resolution of the electrodes in order to insert onto a maximum surface of 3 to 6 $mm^2$ at least 600 stimulation points (equivalent to an image measuring 25 x 25 pixels), which is the minimum threshold required for reading a text. Facial recognition, though, would require at least 1,000 stimulation points. Gislin Dagnelie acknowledges that it will be necessary to wait several years before a visual prosthesis is developed that is usable in every-day life.

Two other speeches were given by professors from the School of Optometry. Caroline Faucher, assistant professor at the School of Optometry, gave a presentation: *Explaining the clinical reasoning of optometrists from two different levels of professional expertise.* Her research work during a PhD in education, looked at and compared the clinical reasoning of optometrists at the competent and expert levels, in order to define the attributes of expertise. Her conclusion: [translation] "the expert plans better, visualizes the clinical case right from the start of the examination, and puts together a treatment or monitoring strategy." This attempt to define the expert's clinical reasoning will undoubtedly have a major impact on training in this competency for coming generations of optometrists. According to Guillaume Giraudet, associate professor and researcher at Jocelyn Fauberts's Laboratoire de Psychophysique et Perception Visuelle gave a speech entitled: [translation] *Do myopic and emmetropic eyes perceive smooth scenes the same way*? According to his work, myopic people have special skills at analyzing / using the low spatial frequencies of their visual environment. As a result, the refraction errors of subjects in psychophysics experiments should be an aspect for selection or controlling for the population taking part in experiments where the spatial frequency content of the visual stimuli is manipulated.

The nine other speeches and 30 posters on the day's agenda were presented by optometry students or graduate students. Tables 1, 2 and 3 list these presentations depending on whether it was a speech or a poster presented by a graduate or undergraduate optometry student.

This event was made possible through a generous contribution from the following companies or organizations: Novartis, the National Bank, the Caisse Desjardins des Versants-du-Mont-Royal, the Réseau FRSQ de Recherche en Santé de la Vision du Québec and the Groupe de Recherche en Sciences de la Vision (GRSV). Also, the sponsors' generosity made it possible to award prizes to nine students for the excellence of their work. The winners were selected by consensus among various juries for each student category, except for the public prize, which was awarded to the presentation obtaining the most votes from among the listeners.

Léa Gagnon, a master's student, earned the Réseau FRSQ de Recherche en Santé de la Vision prize for her speech, *Neural Correlates of Tactile Maze Solving in Congenitally Blind Subjects*. The prizes from the Groupe de Recherche en Sciences de la Vision were won by PhD students: Marie-Eve Laramée for the best scientific presentation,

Étudiants présentant leur affiche / Students presenting their poster

*Dendroarchitecture des neurones corticaux projetant vers l'aire visuelle primaire chez la souris,* and by Valentina Vucéa for the best poster presentation. Her poster was entitled, *Modélisation de la fonction de la réflectométrie pour les vaisseaux sanguins de l'œil.* The Caisse Desjardins des Versants du Mont-Royal prize, for the best clinical research poster (doctor of optometry, OD) was issued to Elior Sandroussy and Maxime Théroux-Soucy for their presentation, *Variation du patron d'arborisation lacrymale avec l'utilisation de larmes artificielles chez des patients souffrant de sécheresse oculaire*; the National Bank award of excellence for the best scientific poster, optometry undergraduate category, was won by Marie-Eve Simard and Kathrine Gaboury for their presentation entitled, *Comparaison entre trois échelles de mesure d'acuité visuelle chez des sujets avec amblyopie unilatérale*. Finally, the public prize from the School for the presentation receiving he most votes was awarded to Patricia Sorya and Mohamed Asfour for their poster entitled, *Influence du diamètre pupillaire sur la mesure de l'épaisseur de la couche de fibres nerveuses péripapillaires au GDxVcc.*

# NEW IN CANADA

# Introducing PrBESIVANCE™ for the treatment of Bacterial Conjunctivitis

- BESIVANCE™ is a new ophthalmic fluoroquinolone with demonstrated clinical efficacy in bacterial conjunctivitis
- BESIVANCE™ also has demonstrated activity in vitro against a broad spectrum of ocular Gram-positive and Gram-negative ocular pathogens[1]*
- Contains DuraSite - a polymeric mucoadhesive matrix drug delivery vehicle[2]

## *Demonstrated efficacy and excellent safety profile in patients 1 year of age and older[1]*

* Clinical significance in ophthalmic infections is unknown.

BESIVANCE™ is indicated for the treatment of patients one year of age and older with bacterial conjunctivitis caused by susceptible strains of the following organisms:

**Aerobic, Gram-Positive**

- CDC coryneform group G
- *Staphylococcus aureus*
- *Staphylococcus epidermidis*
- *Streptococcus mitis*
- *Streptococcus oralis*
- *Streptococcus pneumoniae*

**Aerobic, Gram-Negative**

- Haemophilus influenzae

BESIVANCE™ is contraindicated in patients with known hypersensitivity to this drug, to other quinolones, or to any ingredient in the formulation or component of the container.


**NOT FOR INJECTION INTO THE EYE. FOR TOPICAL OPHTHALMIC USE ONLY.**

In three safety and efficacy trials, no serious adverse reactions related to Besivance™ were reported. The most frequently reported treatment-related ocular adverse events (possibly, probably or definitely related) in the study eye were blurred vision (1.9%), eye irritation (1.3%), and eye pain (1.2%).

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References: 1. Besivance™ Product Monograph. October 23, 2009 2. Data on file

PrBesivance™
besifloxacin ophthalmic suspension, 0.6%

PAAB

See prescribing summary on page 26

# Pr Besivance™

Besifloxacin ophthalmic suspension, 0.6%

## Prescribing Summary

## Patient Selection Criteria

**THERAPEUTIC CLASSIFICATION**

Antibacterial (ophthalmic)

**INDICATIONS AND CLINICAL USE**

BESIVANCE™ is indicated for the treatment of patients one year of age and older with bacterial conjunctivitis caused susceptible strains of the following organisms:

**Aerobic, Gram-Positive**

- *CDC coryneform group G*
- *Staphylococcus aureus*
- *Staphylococcus epidermidis*
- *Streptococcus mitis*
- *Streptococcus oralis*
- *Streptococcus pneumoniae*

**Aerobic, Gram-Negative**

- *Haemophilus influenzae*

**CONTRAINDICATIONS**

BESIVANCE™ is contraindicated in patients with known hypersensitivity to this drug, to other quinolones, or to any ingredient in the formulation or component of the container.

**Special Populations**

**Geriatrics (> 60 years of age):** No overall differences in safety and effectiveness have been observed between elderly and younger patients.

**Pediatrics (< 1 years of age):** The safety and effectiveness of BESIVANCE™ in infants less than 1 year of age have not been established.

**Pregnant Women:** BESIVANCE™ should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus.

**Nursing Women:** Caution should be exercised when BESIVANCE™ is administered to a nursing mother.

## Safety Information

**WARNINGS AND PRECAUTIONS**

**General**

NOT FOR INJECTION INTO THE EYE. FOR TOPICAL OPHTHALMIC USE ONLY. BESIVANCE™ is a sterile suspension for topical ophthalmic use only, and should not be injected subconjunctivally, nor should it be introduced directly into the anterior chamber of the eye. There are no data to support use of BESIVANCE™ in patients with concomitant corneal injury/damage.

**Contact Lenses:** Patients should be advised not to wear contact lenses if they have signs and symptoms of bacterial conjunctivitis or during the course of therapy with BESIVANCE™.

**Growth of Resistant Organisms with Prolonged Use:** As with other anti-infectives, prolonged use of BESIVANCE™ may result in overgrowth of non-susceptible organisms, including fungi. If super-infection occurs, discontinue use and institute alternative therapy. Whenever clinical judgment dictates, the patient should be examined with the aid of magnification, such as slit-lamp biomicroscopy and, where appropriate, fluorescein staining.

**Carcinogenesis and Mutagenesis**

Long-term studies in animals to determine the carcinogenic potential of besifloxacin have not been performed.

**ADVERSE REACTIONS**

**Adverse Drug Reaction Overview**

In three safety and efficacy trials with 2377 patients enrolled, no serious adverse reactions related to BESIVANCE™ were reported. The most frequently reported treatment-emergent ocular adverse events in the study eye were blurred vision (2.1%), eye pain (1.9%), and eye irritation (1.4%).

To report an adverse event, contact your Regional Adverse Reaction Monitoring Office at 1-866-234-2345 or Bausch & Lomb at 1-888-459-5000

## Administration

Instill one drop in the affected eye(s) 3 times a day for 7 days. If a dose of this medication has been missed, it should be taken as soon as possible. However, if it is almost time for the next dose, the missed dose should be skipped and return to the regular dosing schedule. Do not double dose.

Patients should be advised to thoroughly wash hands prior to using BESIVANCE™. Patients should be advised to avoid contaminating the applicator tip with material from the eye, fingers or other source.

Patients should be instructed to invert closed bottle (upside down) and shake once before use. Remove cap with bottle still in the inverted position. Tilt head back, and with bottle inverted, gently squeeze bottle to instill one drop into the affected eye(s).

**SUPPLEMENTAL PRODUCT INFORMATION**

**WARNINGS AND PRECAUTIONS**

**Immune**

**Anaphylaxis and Hypersensitivity:**

Besifloxacin is only commercially available for topical ophthalmic administration. While anaphylaxis or other hypersensitivity reactions have not been observed with topical ophthalmic use of besifloxacin in humans, the potential for such reactions should be considered since patients with known hypersensitivity to fluoroquinolones were excluded from clinical trials.

In patients receiving systemically administered quinolones, serious and occasionally fatal hypersensitivity (anaphylactic) reactions have been reported, some following the first dose. Some reactions were accompanied by cardiovascular collapse, loss of consciousness, angioedema (including laryngeal, pharyngeal or facial edema), airway obstruction, dyspnea, urticaria, and itching. If any allergic reaction occurs, BESIVANCE™ should be discontinued and appropriate therapy should be administered as clinically indicated.

**Bacterial Conjunctivitis Trials**

The rates of the most common treatment-emergent ocular adverse events irrespective of causality observed in eyes treated with BESIVANCE™ during the three bacterial conjunctivitis clinical trials are displayed in Table 1.

**Table 1 - Incidence (%) of Treatment-Emergent Adverse Events Irrespective of Causality that Occurred in ≥ 1% of Study Eyes/Patients Treated with BESIVANCE™ or Vehicle in Bacterial Conjunctivitis Studies (Population: Safety1)**

| Adverse Events | Besifloxacin n=1187 (%) | Vehicle n= 614 (%) |
|---|---|---|
| **Eye Disorders** | | |
| Vision Blurred | 25 (2.1%) | 24 (3.9%) |
| Eye Irritation | 17 (1.4%) | 18 (2.9%) |
| Eye Pain | 22 (1.9%) | 11 (1.8%) |
| Conjunctivitis | 14 (1.2%) | 15 (2.4%) |
| Eye Pruritus | 13 (1.1%) | 10 (1.6%) |
| Conjunctivitis Bacterial | 7 (0.6%) | 9 (1.5%) |
| **Nervous System Disorders** | | |
| Headache | 21 (1.8%) | 11 (1.8%) |

*1 Safety population includes subjects treated for bacterial conjunctivitis that were randomized and received at least one dose of the study drug in the three safety and efficacy studies. BESIVANCE™ was tested in all three studies, while the vehicle was tested in only two of the studies.*

**Less Common Clinical Trial Adverse Drug Reactions (<1%)**

Treatment-related adverse events (possibly, probably or definitely related) reported in 0.1 to 1.0% of eyes receiving BESIVANCE™ included:

**Eye Disorders:** eye pruritus, dry eye, conjunctivitis, conjunctivitis bacterial, punctate keratitis, conjunctival oedema, eye discharge, corneal infiltrates, corneal staining, eyelid margin crusting, keratoconjunctivitis sicca, foreign body sensation in eyes, conjunctival follicles, dry skin, eye disorder, instillation site pain, photophobia, visual disturbance.

**Nervous System Disorders:** headache

**SYMPTOMS AND TREATMENT OF OVERDOSAGE**

No information is available on overdosage of BESIVANCE™. A topical overdose of BESIVANCE™ may be flushed from the eye(s) with warm tap water.

Full Product Monograph available for health professionals at: http://www.bausch.ca

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PAAB

# The COETF Annual Awards Program for 2010

The COETF received a total of 26 applications for awards in 2010. Of those 26 applications, 22 were granted at least partial funding for projects or research. In most cases, applicants are not given full funding as the total amount of funding requested greatly exceeds the money available for granting. Awards funding is based on the Trust Fund's interest earned over the previous year.

All award recipients are required to submit an interim report on their project and a final report upon completion. In an effort to recognize some of the projects and research being done by COETF award recipients, the Awards Committee will publish project reports in the Canadian Journal of Optometry (CJO) so that our members across the country can learn more about where COETF funding goes as well as highlighting exciting optometric research.

## The COETF Annual Awards Program for 2010

SCHOOL OF OPTOMETRY, UNIVERSITY OF WATERLOO
CANADIAN ASSOCIATION OF OPTOMETRY STUDENTS (CAOS)
"The Canadian Handbook of Optometry – online edition"

CIRA, D.
"Quantifying viability of human corneal epithelial cells from non-invasive cell collection techniques"
(Master's Degree Program)

### QUICK FACTS

The Canadian Optometric Education Trust Fund (COETF) was created in 1976 by the members of the Canadian Association of Optometrists to assist programs in research, education and human resources development in the vision and eye care field in Canada.

Through its annual program of Awards, the COETF has supported faculty development, research and/or specialized education programs carried out by graduate students, and investigative projects conducted by undergraduate students and faculty at Canada's schools of optometry, as well as projects undertaken by independent practitioners or members of the public.

HALL, B.
"Impact of contact lens care regimens on the conformation of albumin"
(Master's Degree Program)

HUI, A.
"Development and Engineering of Novel Contact Lens Materials for Drug Delivery"
(Master's Degree Program)

KEECH, A.
"Evaluation of the TearLab nano-osmometer for in-office use"
(Master's Degree Program)

LORENTZ, H.I.
"The efficiency of contact lens cleaning solutions on lipid removal using radiolabeled cholesterol"
(PhD Program)

LUENSMANN, D.
"Is the use of a single protein sufficient to mimic the deposition profile on contact lenses?"
(Post-doctorate)

McCANNA, D.
"Investigating the competitive binding of lysozyme and albumin to contact lenses"

MENZIES, K.
"In vitro analysis of the physical properties of blister pack solutions of silicone hydrogel contact lenses"
(Master's Degree Program)

MUSEUM OF VISUAL SCIENCE
"Historical Archive/Museum Exhibit"

OMMANI, A.: "Optical consequences of diabetes mellitus"
(PhD Program)

OPTOMETRY LEARNING RESOURCE CENTRE
"Continuance of 'Library Information Resources & Services for Canadian Optometrists' program"

WOODS, J.: "Repeatability assessment of the 'Subjective evaluation of symptoms of dry eye' (SESOD) dry eye questionnaire"
(PhD Program)

ÉCOLE D'OPTOMÉTRIE,
UNIVERSITÉ DE MONTRÉAL (UM)
BITTON, E., JONES, D.:
"Canadian optometry student indebtedness"

CARCENAC, G., KERGOAT, H.
"Évaluation de la function visuelle chez la personne âgée vulnerable"
(PhD Program)

CHRIQUI, E., KERGOAT, H.
"Optimisation de la prise d'acuité visuelle chez les patients ages ayant des difficulties importantes à communiqué ou collaborer lors de l'examen visuel."
(Master's Degree Program)

DUTRISAC, F.
"Élaboration d'un questionnaire de dépistage des hallucinations sensorielles liées à la defiance visuelle et auditive"
(Master's Degree Program)

DUTRISAC, C., KERGOAT, H.:
"Investigation neurovasculaire de la rétine lors d'un stress hypoxique systémique léger"
(Master's Degree Program)

HANSSENS, J-M.
"La stabilization visuelle de la posture est-elle perturbée par des taches cognitive complexes chez les personnes âgées"
(PhD Program)

HONG, Y., XIE, T., BITTON, E.: "
A novel technique for the analysis of human tears"

INDEPENDENT PRACTITIONER
LAM, N., LEAT, S.
"Investigating vision care in the low vision population"

PENNER, V.
"Collagen cross linking: A Canadian review"

## APPLICATION SUMMARY

| | | |
|---|---|---|
| Total Waterloo School of Optometry Applications | 14 | $68,750.00 |
| Total Waterloo School of Optometry Awards | 13 | $23,100.00 |
| Total Montréal School of Optometry Applications | 9 | $32,510.00 |
| Total Montréal School of Optometry Award | 7 | $11,100.00 |
| Total Independent Practitioner Applications | 3 | $130,600.00 |
| Total Independent Practitioner Awards | 2 | $4,100.00 |
| Total Applications for 2010 | 26 | $231,860.00 |
| Total Independent Practitioner Awards | 22 | $38,300.00 |
| **Total Applications (since inception)** | | **$5,984,147.78** |
| **Total Awards** | | **$1,726,113.00** |

### COETF REPORT * RAPPORT DU FFOCÉ

In an effort to highlight some of the projects and research by COETF award recipients, the COETF Trustees and Awards Committee have selected project reports to be published in the *Canadian Journal of Optometry · Revue canadienne d'optométrie*. Recognizing that many recipients intend to publish their work in cited journals, the reports are not considered to be clinical articles. COETF funded research, when completed and peer reviewed, may be published in CJO·RCO and other journals. The COETF reports are intended to provide relevant information for the benefit of our readers and to showcase the high caliber of optometric research funded by COETF, Canadian optometry's charity.

Research and academic support are vital to our profession. COETF is our charity, and needs our contributions, now more than ever. Please give generously and often. To donate online or download a donation form, visit: opto.ca/en/our-partners/coeft.htm

Lien français
opto.ca/fr/our-partners/coeft.html

# Two Canadian Optometric Education Trust Fund Annual Interim Reports

FUNDING GRANTED – APRIL 2009-2010

APPLICANT: KARA L MENZIES, BSc, MSc CANDIDATE

## In vitro analysis of the physical properties of blister pack solutions of silicone hydrogel contact lenses

This annual interim report describes the results from an in vitro experiment measuring the wettability of three daily disposable lenses: Proclear 1-Day (CooperVision), Focus Dailies with AquaComfort-Plus (CIBA Vision) and Acuvue TruEye (Johnson & Johnson).

Surface wettability of contact lenses is typically assessed in vitro by determining water contact angles (CAs) at the lens/fluid interface. A high CA indicates low wettability, or a relatively hydrophobic solid surface. A low CA, in which there is a smooth, continuous fluid film over the solid surface, signifies high wettability or a relatively hydrophilic surface. In this experiment, wettability was measured using two different methods: the sessile drop method and the Wilhelmy balance technique.

Before wettability measurements the lenses were placed in a "model blink cell." The model blink cell mimics eye blinking in an in vitro setting. It is composed of a pump/valve system, a "bath" which contains six pistons with convex surfaces, two sensors in the bath, a series of tubes for delivery of solutions, a container holding fresh solution and a container that holds waste solution (*Figure 1*).

Six contact lenses can be placed posterior side down on the top of the pistons at one time (*Figure 1*). A solution, such as saline or artificial tear solution, is brought up from the container holding the fresh solution and cycled through the model blink cell until a purge time is reached. The solution runs through the tubing, into the bath containing the pistons and contact lenses, and then back into the tubing. As solution is cycled through the model blink cell, the pistons move up and down, consequently moving the contact lenses in and out of the solution, to mimic blinking. The amount of time the contact lenses spend in and out of the solution is controlled by the experimenter by setting the time

Figure 1: *The model blink cell, showing the pistons, valves, tubing series, pump and sensors*

intervals on the control box resting on top of the model blink cell (*Figure 2*). Other settings that are controlled by the experimenter are the purge and refill time, as well as the temperature inside the model blink cell.

In this experiment, lenses were placed on the pistons in the model blink cell with only one type of lens placed on the pistons at one time. The lenses were then exposed to saline, a lysozyme

solution, and an artificial tear solution for five minutes, and for one, four and eight hour time intervals. During these time intervals the pistons moved in and out of the solution so the lenses would be in the solution for one second and out of the solution for five seconds to mimic blinking.

Wettability measurements were similar for the Proclear 1-Day and Acuvue TruEye lenses, after both types of lenses were exposed to all three solutions for five minutes, one hour, four hours, and eight hours. There was a slight decrease in contact angle measured by the sessile drop technique after the lenses had been exposed to the lysozyme and artificial tear solutions. For the Focus Dailies with AquaComfortPlus lenses, there was a significant decrease in contact angle measured by the sessile drop technique after the lenses were exposed to the lysozyme solution for all time points. However, there was not a significant difference in contact angle after the lenses were exposed to the artificial tear solution, except after the eight hour time point.

The remainder of the in vitro contact angle analyses using the Wilhelmy balance method is currently being completed, in addition to the final statistical analysis for this project.

Figure 2: *The control box sets temperature, purge and refill times, and the amount of time lenses are in and out of the fluid bath.*

APPLICANTS: TONG, A., SIMPSON, T., AND BOBIER, W.R. / 2009 REPORT

## Examining ocular dominance

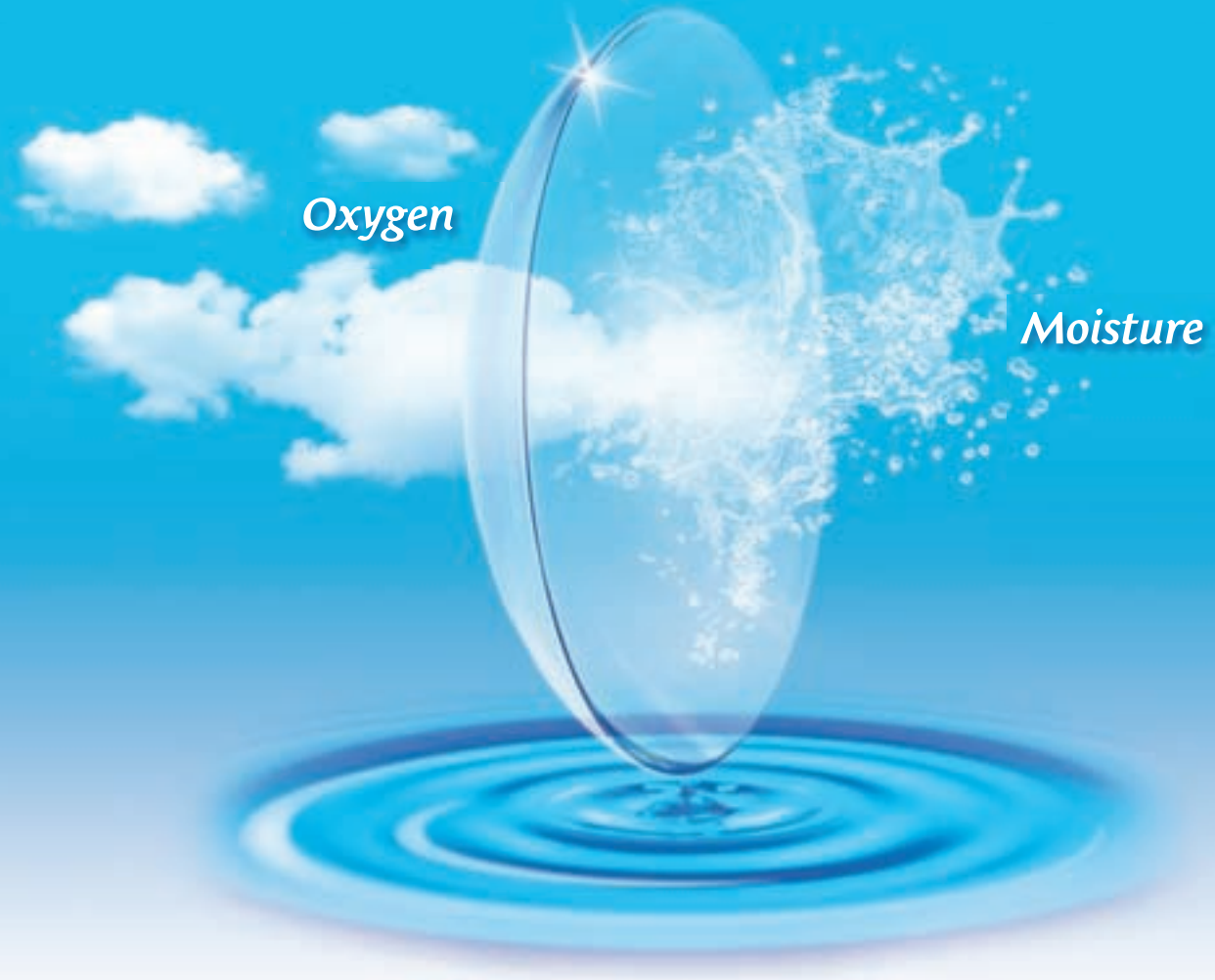
Ocular dominance, the concept that one eye performs better than its fellow eye, can in some regards be compared to the concept of handedness, i.e. the ability to use one hand with more dexterity than the other. Ocular dominance has been shown to be task specific and is presently a poorly understood phenomenon. It has been defined on the basis of sighting (e.g. the eye that is used for viewing through a camera eyepiece), sensory function (e.g. the eye with the better visual acuity), or persistence in a binocular rivalry situation (e.g. the more persistent image perceived in a dichoptic presentation). A recent report suggests that different types of ocular dominance are not in agreement and that sensory dominance (as measured by resolution acuity, contrast sensitivity, and Vernier acuity) is insignificant in the normal visual system in most individuals with normal vision. However, it was suggested that different psychophysical methods of measuring ocular dominance or different criteria may yield different results.

To this end, we are interested in whether ocular dominance can be detected using a method that has been devised for assessing binocular function in amblyopic adults that has recently been developed by our collaborators (Robert Hess,

INTRODUCING NEW

# AIR OPTIX™ AQUA

## An Advanced Combination of Natural Elements




A New Level of
COMFORT[†1]

On Contact
All Day
Every Day

## Introducing the AQUA Moisture System


**Lubricates** A new, unique moisture agent for comfort on contact

**Maintains** A patented lens material to help maintain moisture[‡2] for comfort all day

**Sustains** An ultra-smooth surface with superior wettability[§3] and excellent deposit resistance[4] for comfort every day


**Call your CIBA VISION representative or visit mycibavision.com.**

[†]Compared with $O_2$OTIX®. * AIR OPTIX AQUA: Dk/t 138@ -3.00D. Other factors may impact eye health.
[‡] Based on in vitro measurements compared with high-water content (>50%) hydrogel lenses.
[§] In vitro measurement compared with ACUVUE® OASYS™, ACUVUE® ADVANCE™, Biofinity®, and PureVision®.

**References: 1.** CIBA VISION, data on file, 2007. **2.** CIBA VISION, data on file, 2004. **3.** CIBA VISION, data on file, 2007. **4.** CIBA VISION, data on file, 2007.

McGill University). Although it is traditionally thought that a history of amblyopia precludes binocular vision because the mechanisms that combine the information between the two eyes were absent, it was recently discovered that they are actually working but are suppressed by actively inhibitory signals from the non-amblyopic eye. This opens the way to a novel binocular approach for the restoration of normal binocular function and treatment of amblyopia by first measuring the degree of this inter ocular inhibition and using a simple binocular training regime to reduce it over time. This was shown by our collaborators have shown this to be effective in adults well beyond the age where such therapies are thought effective.

Further investigation is required to determine the full potential of this approach. At the present time, however, data from normal sighted individuals without strabismus or amblyopia was used as a point of comparison for visual behaviour in amblyopes observed by this psychophysical method.

This study was conducted in three phases. The first compared fellow eyes within individuals to determine the presence of dominance. The second phase involved inducing dominance by blurring the percept of one eye using a plus lens. The third phase similarly induces dominance in the fellow eye by reducing retinal luminance using a neutral density (ND) filters. Ultimately, this protocol will be used with adult amblyopes to determine its effectiveness as a means of breaking suppression in the amblyopic eye. This is achieved by increasing the intensity of the visual stimulus in the amblyopic eye while blunting the stimulus in the preferred or fixing eye.

To date, an apparatus consisting of a set of computer gaming goggles capable of simultaneously displaying different inputs to each eye is being used for the experiment. This allows one eye to see the "signal" dots and the fellow eye to see the "noise" dots. Software has been established to present this stimulus in a consistent manner to the subject, enabling us to determine the balance point between noise and signal between the dominant eye and non-dominant eyes. Five normal sighted individuals and one amblyopic have participated in the study. Analysis of the results is in progress. Future work will determine whether dominance in the fellow eye can be trained using the similar methodology. For now, we have established a new means of determining ocular dominance for our studies.

This work provides important preliminary information on the capacity of the instrumentation to determine ocular dominance as a function of varying input differences set between the eyes. This information will serve as a precursor for the development of testing protocols for studies on amblyopes.

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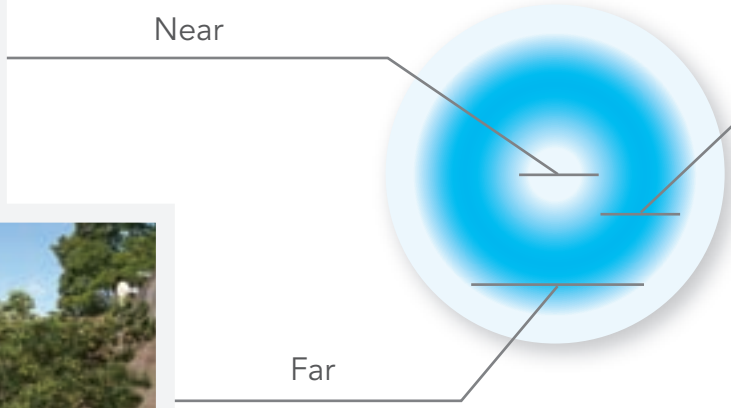


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† Based on subjective ratings of quality of vision during the night, day, and overall.

†† Based on subjective ratings of consistenc of vision throughout the day and from lens to lens.

**References:** 1. In a randomized, sponsor masked clinical study among wearers of Focus® Dailies® contact lenses, at 10 sites with 177 patients; significance demonstrated at the 0.05 level. CIBA VISION data on file, 2009. 2. Based on contact angle measurement in vitro on unworn lenses and ex vivo on worn lenses; significance demonstrated at the 0.05 level. CIBA VISION data on file. 2008. 3. Ex vivo analysis of worn lenses; significance demonstrated at the 0.05 level. CIBA VISION data on file, 2008.



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