

CJO|RCO

CANADIAN JOURNAL OF OPTOMETRY | REVUE CANADIENNE D'OPTOMÉTRIE



VOL 75 NO 3 | 2013

Amendments to the
Optometry Act Allow
Optometrists to Prescribe
Medication in **Manitoba**

Identifying the needs for eye care
education in **Quebec**, Canada

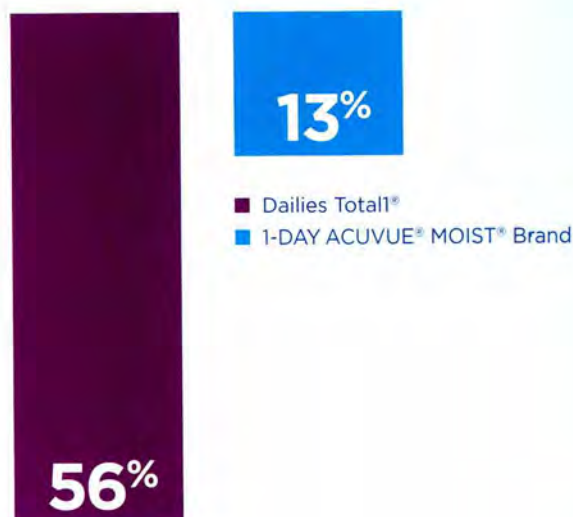


LA DIXIÈME JOURNÉE SCIENTIFIQUE DE L'ÉCOLE D'OPTOMÉTRIE – ŒIL, CERVEAU ET VISION
GUIDE DU CONSEIL DE LA SANTÉ DE L'ŒIL DE L'ONTARIO SUR LE SOIN DES PATIENTS QUI ONT LE GLAUCOME
ENANTIOMORPHIC GLAUCOMA DISPLAYED IN MONOZYGOTIC TWINS

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La CJO*RCO est prête à accueillir de nouveaux annonceurs. Dans l'esprit de l'objectif de la CJO*RCO visant à favoriser la sensibilisation, la formation et le professionnalisme des membres de l'ACO, on pourra soumettre tout matériel publicitaire avant publication pour examen par le Comité national des publications de l'ACO. L'ACO se réserve le droit d'accepter ou de refuser toute publicité dont on a demandé l'insertion dans la CJO*RCO.

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Left to right: Dr. Paul Geneau, President, Dr. Lil Linton, Past President, Mr. Glenn Campbell, former Executive Director, and Dr. Barry Thienes, President-Elect along with Dr. Kirsten North (not present in photo) met in mid-June to interview candidates for the Executive Director position at CAO.

De gauche à droite :

Le Dr Paul Geneau, président, la Dre Lil Linton, présidente sortante, M. Glenn Campbell, ancien directeur général, le Dr Barry Thienes, trésorier du Conseil de l'ACO ainsi que la Dre Kirsten North (absente sur la photo) se sont réunis à la mi-juin pour rencontrer des candidats au poste de directeur général de l'ACO.

BY / PAR DR. PAUL GENEAU, OD

As your new CAO President, it is both exciting and humbling to be taking the reins of our national association from Dr. Lil Linton. I am following in the footsteps of a great number of high quality leaders in this role. Lil is no exception. She has presided in her own forthright style, always friendly, building and maintaining relationships. She is a diligent and conscientious worker, approaching every issue with a "git er done" attitude. This has been evident during her long tenure serving the optometric profession, with the New Brunswick Association of Optometrists, with the CAO, and particularly in her many years as chair of our National Public Education Committee. Lil deserves to be very proud of how NPEC has evolved, adjusting and changing to garner full national participation, under the new public identity of Doctors of Optometry Canada.

Dr. Linton's contributions to our profession were recognized at our recent CAO Congress, in Edmonton. The Alberta Association of Optometrists, and local

"The future is not some place we are going to, but one we are creating. The paths are not to be found, but made, and the activity of making them changes both the maker and the destinations."

— John H Schaar

organizers, Dr. Larry Gies and Dr. Femida Visnani, with their army of volunteers, did a great job putting on this event. Also recognized that weekend was Glenn Campbell, retiring after 15 years as Executive Director of CAO, preceded by an equal length of time at the helm of the AAO. Glenn has been another extremely dedicated contributor to Canadian Optometry, and he will be sorely missed at the CAO office and at the council table.

Glenn's successor is Ms. Laurie Clement. She has big shoes to fill, but she has the skill set, the experience, and the attitude to pick up the ball and run with it. We will ensure that she has the resources and support that she needs.

It is extremely helpful for both Laurie and myself, as we begin our terms, that the CAO is holding a Strategic Planning Session in September. That session will

delineate the priorities that our members want us to achieve actions on. Our deliberations will be guided by our recent survey of members, for which we were happy to receive a very good response, as well as surveys of provincial associations and industry partners. At all times, however, the CAO is open to input from our members, please feel free and encouraged to contact myself, our executive director, or your provincial CAO representative whenever you have a suggestion, a concern, or even a compliment. Everyone enjoys compliments.

In strategic planning, it is important to identify and understand all of our strengths, weaknesses, opportunities and threats. We must be looking forward, planning for the future, not trying to get back to a past that doesn't and can't exist anymore. We will prevail.

À titre de nouveau président de l'Association canadienne des optométristes (ACO), c'est avec enthousiasme et en toute humilité que je prends les rênes de notre association nationale pour succéder à la Dre Lil Linton. Je suis les traces d'un grand nombre d'excellents dirigeants qui ont assumé ce rôle. Lil ne fait pas exception. Elle a présidé l'Association avec la simplicité qui la caractérise, se montrant toujours aimable et s'employant à créer et à entretenir ses relations. La Dre Lil Linton est une personne diligente et consciencieuse qui aborde chaque problème en étant bien déterminée à le résoudre. Cette attitude est clairement ressortie pendant ses longs états de service dans la profession optométrique au sein de l'Association des optométristes du Nouveau-Brunswick, de l'ACO et, particulièrement, durant les nombreuses années de son mandat de présidente de notre Comité national d'éducation publique (CNEP). Lil peut être très fière de la façon dont le CNEP a évolué, s'est rajusté, puis s'est transformé pour mobiliser les optométristes à l'échelon national sous la nouvelle identité publique de Docteurs en optométrie Canada.

Les contributions de la Dre Linton à notre profession ont été reconnues à notre récent Congrès de l'ACO à Edmonton. L'Association des optométristes de l'Alberta (AOA) et les organisateurs locaux, le Dr Larry Gies et la Dre Femida Visnani, de même que leur armée de bénévoles ont fait un formidable travail d'organisation à l'occasion de cet événement. La carrière de Glenn Campbell, qui a pris sa retraite après 15 années à titre de directeur général de l'ACO et 15 autres années à la barre de l'AOA, a aussi été célébrée au cours du

week-end. Glenn a été un autre contributeur extrêmement dévoué au milieu de l'optométrie du Canada et il nous manquera énormément au bureau de l'ACO et à la table du conseil.

Mme Laurie Clement prendra la place de Glenn. Il ne sera pas aisé de remplacer son successeur, mais Mme Clement possède l'ensemble de compétences, l'expérience et l'attitude nécessaires pour prendre la relève. Nous veillerons à ce qu'elle dispose des ressources et du soutien dont elle a besoin.

Autant pour Laurie que pour moi, il est extrêmement utile que l'ACO tienne une séance de planification stratégique en septembre, au moment où nous commençons nos mandats. Cette séance permettra de délimiter les priorités de nos membres en matière d'action. Nos délibérations seront orientées par notre récent sondage auprès des membres, auquel nous étions ravis d'obtenir un excellent taux de réponses, de même que par les sondages auprès des associations provinciales et des partenaires de l'industrie. Toutefois, l'ACO est toujours ouverte aux suggestions de ses membres. Je vous invite donc à communiquer avec moi, avec notre directeur général ou avec votre représentant provincial de l'ACO si vous avez une suggestion, une préoccupation, ou même des félicitations. Les félicitations sont toujours bienvenues.

En planification stratégique, il est important de déterminer et de comprendre toutes nos forces, nos faiblesses, les possibilités et les menaces. Nous devons aller de l'avant, planifier l'avenir et ne jamais tenter de revenir en arrière puisque le passé ne peut plus exister. Nous surmonterons les obstacles.

The Canadian Association of Optometrists Welcomes a New President

EDMONTON, JULY 13, 2013 – The Canadian Association of Optometrists (CAO) is pleased to announce that at their 33rd Biennial Congress – the CAO Council elected Dr. Paul Geneau, Nanaimo, BC as the new President, CAO. Dr. Geneau brings extensive and distinguished experience in both optometric association and community affairs.

Dr. Paul Geneau graduated from the University of Waterloo School of Optometry in 1981. Initially practicing in Invermere, BC for eight years, he settled, and currently practices in Nanaimo, BC at Eye Care Nanaimo. He has held positions as Councillor and President of the British Columbia Association of Optometrists (BCAO) and has been a Council member of the Canadian Association of Optometrists since 2006, serving as Secretary Treasurer 2009-2011, and President Elect 2011-2013, and most recently, President – July 13th, 2013.

Discovering a passion for public education, Dr. Geneau served as chair of the BCAA Public Relations Committee, and later as its representative for the CAO National Public Education Committee (NPEC) which formed in 1996. Remaining involved almost continuously since then, he is proud of the collaborative approach that the committee has employed to develop campaigns that provide information about eye health and convey to the public the importance of regular eye examinations, including the recent exciting national launch of Doctors of Optometry Canada, in May 2013. He is committed to providing leadership, fostering provincial-national cooperation and planning for the future of the optometric profession as its members continue to provide primary eye health care for Canadians.

« L'avenir n'est pas un endroit où nous allons, mais plutôt ce que nous créons. Il ne faut pas chercher le chemin, mais plutôt le tracer, et cette étape transforme à la fois celui qui trace le chemin et sa destination. »

– John H. Schaar

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CANADA



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Healthy Eyes. Doctor Delivered.™

Doctors of Optometry Canada (DOC) is the national public education campaign developed by the Canadian Association of Optometrists and the 10 provincial optometric associations. With the DOC campaign, we are educating the public that Doctors of Optometry are a trusted single source for all things eye health and eye care related.

What We've Done

By now CAO members should have received DOC packages containing marketing materials such as eye health brochures and rack cards. Reorders of DOC collateral are available online to all provinces **free of charge** through the end of 2013. In addition to DOC collateral, CAO members and optometric staff can access free digital recall cards online to remind patients of upcoming appointments, or you can order print recall cards at a discounted price. Visit members.doctorsofoptometry.ca to place your order.

What's Still Ahead

This October will be the first annual Children's Vision Month, which will aim to educate parents about the importance of eye exams for children. We'll roll out a number of activities in the fall to help achieve our goal of getting parents to book regular eye exams for their children. Check your DOC eNewsletter for more information.

This fall, we'll also continue to run contests and prizes for optometric staff, and will provide more tips for engaging with the campaign.

Watch out for ongoing Facebook contests and promotions for your patients at facebook.com/AskADoctorOfOptometry.

Join our thriving Facebook community!

40,000+
fans



Like our page @
facebook.com/askadoctorofoptometry



250 questions
answered
by Doctors to date

Ways to Get Involved

1. During Children's Vision Month, **use your Vision and Success at School rack cards** to start conversations with parents about children's eye health.



2. As children return to school in the fall, **use DOC recall cards** to remind parents that their children need regular eye exams.



3. **Tell your patients to join our Facebook community.** On the page, patients can ask eye health questions between regular appointments—and a Doctor of Optometry provides an answer, typically within 24 hours. There are also regular contests on the page to win free products and services from a Doctor of Optometry! [Facebook.com/AskADoctorOfOptometry](https://facebook.com/AskADoctorOfOptometry).

Healthy Eyes.
Doctor Delivered.™

Get Involved! We welcome your input and feedback. Should you have any questions, comments or concerns, or would like to play a larger role in the campaign as an ambassador, a spokesperson, a video star or answer questions on the Facebook page, don't hesitate to contact us at info@doctorsofoptometry.ca.

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Docteurs en optométrie Canada.

Des yeux en santé. Votre docteur en optométrie.^{MC}

Docteurs en optométrie Canada est la campagne nationale de sensibilisation du public de l'Association canadienne des optométristes et des 10 associations provinciales des optométristes. Elle vise à faire valoir auprès du public que les docteurs en optométrie constituent une ressource unique pour tous les besoins en matière de santé des yeux et de soins de la vue.

Nos réalisations

À l'heure actuelle, tous les membres de l'ACO devraient avoir reçu une trousse contenant le matériel promotionnel de la campagne Docteurs en optométrie, notamment des dépliants sur la santé des yeux et des cartes publicitaires. Les membres de toutes les provinces peuvent commander du matériel supplémentaire en ligne **gratuitement** jusqu'à la fin de 2013. En plus des documents de la campagne Docteurs en optométrie, les membres de l'ACO et le personnel des cliniques d'optométrie peuvent obtenir gratuitement des cartes numériques pour rappeler aux clients leur rendez-vous à venir. Ils peuvent également commander des cartes de rappel papier à prix réduit. Visitez le site membres.docteursenoptometrie.ca pour passer votre commande.

Activités à venir

Le mois d'octobre marquera le premier Mois de la vision des enfants, qui vise à sensibiliser les parents à l'importance des examens de la vue pour leurs enfants. Nous allons réaliser une série d'activités cet automne pour atteindre notre objectif d'amener les parents à faire passer régulièrement des examens de la vue à leurs enfants. Consultez le bulletin électronique Docteurs en optométrie pour en savoir plus.

Cet automne, les concours et l'attribution de prix destinés au personnel des cliniques d'optométrie se poursuivront. Nous donnerons également d'autres conseils pour participer à la campagne.

Visitez le [facebook.com/AskADoctorofOptometry](https://www.facebook.com/AskADoctorofOptometry) pour rester à l'affût des concours Facebook et des promotions pour vos patients.

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40 000
adeptes



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250 questions
résolues
par des docteurs
jusqu'à maintenant

Comment participer

1. Au cours du Mois de la vision des enfants, **utilisez les cartes intitulées La vision et la réussite scolaire** pour entamer une discussion avec les parents sur la santé oculaire de leurs enfants. 
2. Lors de la rentrée des classes, **utilisez les cartes de rappel Docteurs en optométrie** pour rappeler aux parents que leurs enfants ont besoin de passer régulièrement des examens de la vue. 
3. Invitez vos patients à se joindre à nous sur Facebook. Sur notre page, les patients peuvent poser des questions sur la santé des yeux entre leurs rendez-vous habituels et obtenir une réponse d'un docteur en optométrie, généralement dans les 24 heures. De plus, on y présente souvent des concours permettant de remporter des produits et services gratuits offerts par un docteur en optométrie! Facebook. [com/AskADoctorofOptometry](https://www.facebook.com/AskADoctorofOptometry).

Participez! Si vous avez des commentaires ou des questions, ou si vous souhaitez vous impliquer en participant aux capsules vidéo, n'hésitez pas à communiquer avec nous à info@docteursenoptometrie.ca.

^{MC} Utilisée sous licence.

Des yeux en santé.
Votre docteur en optométrie.^{MC}

L'Association canadienne des optométristes accueille un nouveau président

EDMONTON, 13 JUILLET 2013 – L'Association canadienne des optométristes (ACO) est heureuse d'annoncer que le Conseil de l'ACO a élu le Dr Paul Geneau de Nanaimo (Colombie-Britannique) à la présidence de l'ACO à l'occasion de son 33^e congrès biennal. Le Dr Geneau possède une expérience exhaustive et éminente au sein de l'association optométrique et des affaires communautaires.

Le Dr Paul Geneau est diplômé de l'École d'optométrie de l'Université de Waterloo depuis 1981. Après avoir d'abord pratiqué à Invermere en Colombie-Britannique pendant huit ans, il s'est installé à Nanaimo, où il pratique actuellement les soins oculovisuels à Eye Care Nanaimo. Il a occupé le poste de conseiller et de président de l'Association des optométristes de la Colombie-Britannique et il siège au Conseil de l'Association canadienne des optométristes depuis 2006, d'abord à titre de secrétaire-trésorier de 2009 à 2011, puis à titre de président désigné de 2011 à 2013 et, plus récemment, à titre de président, depuis le 13 juillet 2013.

Lorsqu'il s'est découvert une passion pour la sensibilisation du public, le Dr Geneau est devenu président du Comité des relations publiques de l'AOCB et, ensuite, représentant du Comité national d'éducation publique (CNEP) de l'ACO, formé en 1996. Ayant été presque toujours actif au sein du Comité depuis, il est heureux de l'approche de collaboration adoptée par le Comité pour élaborer des campagnes visant à informer le public sur la santé oculovisuelle et à lui communiquer l'importance des examens réguliers de la vue, notamment le récent lancement national prometteur de Docteurs en optométrie Canada en mai 2013. Il est déterminé à faire preuve de leadership, à favoriser la coopération provinciale-nationale et à planifier l'avenir de la profession optométrique pendant que ses membres continuent à fournir des soins primaires de santé oculovisuelle à la population canadienne.



New Executive Director Appointed by CAO

CAO is pleased to announce the appointment of Ms. Laurie Clement, Executive Director, CAO. As an experienced leader in the not-for-profit sector, Ms. Clement has spent the greater part of her thirty year career in Non Governmental Organizations, the past ten at the Executive Director level. Her prior 15 years' experience was with the Canadian Nurses Association (CNA), the national professional voice of 150,000 registered nurses in Canada. For the past ten years, she served as Executive Director for two national, charitable organizations. At the Michaëlle Jean Foundation, alongside a staff of 3 and a board of 20, she had the opportunity to build an organization from the ground up. Her strengths lie in: leadership, collaboration, strategic planning, operational and financial management, communications and marketing. Fluent in Canada's two official languages, she is also conversant in Spanish. Laurie may be reached at the CAO office at lclement@opto.ca and 1-888-263-4676 x 212. Welcome aboard Laurie!!

L'ACO nomme une nouvelle directrice générale

L'ACO est heureuse d'annoncer la nomination de Mme Laurie Clement au poste de directrice générale. Comme dirigeante chevronnée dans le secteur sans but lucratif, Mme Clement a passé la majeure partie de ses 30 années de carrière dans des organisations non gouvernementales, dont les 10 dernières au niveau de directrice générale. Elle a acquis ses 15 années d'expérience antérieures à l'Association des infirmières et infirmiers du Canada (AIIIC), porte-parole nationale de la profession de 150 000 infirmières autorisées au Canada. Depuis 10 ans, elle était directrice générale de deux œuvres de bienfaisance à l'échelon national. À la Fondation Michaëlle-Jean, en compagnie d'un personnel de trois employés et d'un conseil de 20 personnes, elle a eu l'occasion de bâtir une organisation à partir de zéro. Ses points forts sont le leadership, la collaboration, la planification stratégique, la gestion opérationnelle et financière, la communication et le marketing. Maîtrisant les deux langues officielles du Canada, elle s'exprime aussi en espagnol. Il est possible de joindre Laurie au bureau de l'ACO à l'adresse lclement@opto.ca et au 1-888-263-4676, poste 212. Bienvenue, Laurie!!

Glenn Campbell's Retirement Honoured with Three Awards

Glenn Campbell, Executive Director, CAO retired in July 2013, after 15 years at the national association and a 30 year career. He will be greatly missed by CAO staff and the optometric community for his exemplary leadership, dedication and contribution to the profession both provincially and nationally. His service was marked by The Quebec Association of Optometrists' (AOQ) Autre Regard Award, presented by Dr. Steven Carrier, President at AOQ Annual General Meeting. At the 33rd Biennial CAO Congress he was awarded with a CAO Honorary Membership by

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Dr. Dorrie Morrow Honoured with President's Award La Dre Dorrie Morrow reçoit le prix du Président

Dr. Lil Linton, Past President, CAO presented Dr. Dorrie Morrow with the CAO President's Award at the President's Banquet and Ball during Congress, on Saturday, July 13, 2013, in Edmonton. Dr. Morrow has lead a long and distinguished career in optometry with involvement in both the provincial and national associations. In the words of the AAO, "She has been a leader, a mentor, and an inspiration to many optometrists within Alberta and across Canada". Some of her notable achievements include serving on the AAO Council for 17 years including as President from 1994-1996 (– the first female President in the AAO history). In 1999, she joined the Canadian Association of Optometrists Council and from 2005-2007 served as CAO President. Dr. Morrow also initiated the highly successful 'Eye See Eye Learn' program in Alberta and established the Children's Vision Initiative at CAO.

La Dre Lil Linton, présidente sortante de l'ACO a remis le Prix du président de l'ACO à la Dre Dorrie Morrow à l'occasion du banquet et bal du président qui se tenaient pendant le Congrès, le samedi 13 juillet 2013, à Edmonton. La Dre Morrow a eu une longue carrière distinguée en optométrie au cours de laquelle elle a servi les associations tant provinciale que nationale. Pour citer l'AOA, « elle a été un chef de file, un mentor et une source d'inspiration pour beaucoup d'optométristes de l'Alberta et du Canada ». Ses réalisations dignes de mention sont nombreuses : elle a notamment siégé au Conseil de l'AOA pendant 17 ans et y a rempli un mandat à la présidence de 1994 à 1996 (elle a été la première présidente dans l'histoire de l'AOA). En 1999, elle s'est jointe au Conseil de l'Association canadienne des optométristes et a présidé l'Association de 2005 à 2007. La Dre Morrow est aussi à l'origine du programme très réussi « Eye See Eye Learn » en Alberta et a aidé à lancer l'Initiative pour la vision des enfants à l'ACO.

CAO President, Dr. Linton and a Lifetime Membership of the International Association of Optometric Executives by Mr. Thom Eichhorst, Honorary member, CAO. So well deserved. Congratulations!

Nouvellement retraité, M. Glenn Campbell est honoré trois fois

M. Glenn Campbell, directeur général de l'ACO, a pris sa retraite en juillet 2013, après 30 ans de carrière, dont 15 années au sein de l'association nationale. Il manquera beaucoup au personnel de l'ACO ainsi qu'à la communauté optométrique pour son leadership exemplaire, son dévouement et sa contribution à la profession, tant au niveau provincial que national. Pour souligner ses années de services, l'Association des optométristes du Québec lui a décerné au cours de son assemblée générale annuelle, le prix Autre Regard, présenté par le Dr Steven Carrier, président de l'AOQ. Au 33^e Congrès biennal de l'ACO, il a été nommé membre honoraire de l'ACO par la Dre Linton, présidente de l'ACO, et membre à vie de l'International Association of Optometric Executives par M. Thom Eichhorst, membre honoraire de l'ACO. Des honneurs bien mérités. Félicitations!!

Dr. Mike Dennis appointed to CAO Council

CAO is pleased to announce that the BC Association of Optometrists has appointed Dr. Mike Dennis as the new CAO Councilor from BC, replacing Dr. Paul Geneau, incoming President. Dr. Dennis has a long history of service to optometry including as President, BCO. He also has a long and active involvement with the Canadian Diabetes Association. He is married to an optometrist, Dr. Julie Louie, his father was an optometrist and his daughter is in the optometry program at the School of Optometry and Vision Science at UW. Dr. Dennis is a welcome addition to the CAO Council. Congratulations!

Le Dr Mike Dennis nommé au Conseil de l'ACO

L'ACO est heureuse d'annoncer que l'Association des optométristes de la Colombie-Britannique a nommé le Dr Mike Dennis nouveau membre du Conseil de l'ACO pour la C.-B. Il remplace le Dr Paul Geneau, président désigné. Le Dr Dennis sert l'optométrie depuis longtemps, et il a notamment rempli un mandat à la présidence de l'AOCB. Il est aussi actif depuis longtemps à l'Association canadienne du diabète. Il a épousé une optométriste, la Dre Julie Louie, son père était optométriste et sa fille est inscrite au programme d'optométrie à l'École d'optométrie et de sciences de la vision de l'UW. Le Dr Dennis est un ajout bienvenu au Conseil de l'ACO. Félicitations!

Changes at the Quebec Order of Optometrists

On May 24, 2013, Dr. Langis Michaud was appointed President, of the QOO at the Order's Annual General Meeting. Dr. Lise-Anne Chassé, who served as President for the past 12 years, will be taking a well deserved break from this position. Congratulations to both!

Changements à l'Ordre des optométristes du Québec

Le 24 mai 2013, le Dr Langis Michaud a été nommé président de l'OOQ au cours de l'Assemblée générale de l'Ordre. La Dre Lise-Anne Chassé, qui a occupé la présidence au cours des 12 dernières années, prendra une pause bien méritée. Félicitations aux deux!

New Appointments at the Vision Institute of Canada Nouvelles nominations au Vision Institute of Canada

At a recent meeting of the Board of Directors, Dr. Brian Feldman was elected President and Dr. Mira Acs was elected Vice President. The Vision Institute is also very pleased to announce that Ms. Barbara Wattie Fuller, former Executive Director of the Ontario Association of Optometrists, has joined the Board of Directors of the Vision Institute. Her knowledge and years of experience with the OAO will be of great value as the Vision Institute continues its mission of eye health education, research and specialized clinical services. The Vision Institute is continuing its efforts to raise awareness about the importance of comprehensive eye exams for First Nations school children and for Aboriginal people living with diabetes.

Au cours d'une récente réunion du conseil d'administration, le Dr Brian Feldman a été élu président et la Dre Mira Acs, vice-présidente. Le Vision Institute est aussi très heureux d'annoncer que Mme Barbara Wattie Fuller, ancienne directrice générale de l'Association des optométristes de l'Ontario, s'est jointe au conseil d'administration du Vision Institute. Ses connaissances et ses années d'expériences à l'AOO seront très précieuses au moment où le Vision Institute poursuit sa mission d'éducation, de recherche et de services cliniques spécialisés en santé oculovisuelle. Le Vision Institute désire mieux faire connaître l'importance des examens complets de la vue pour les enfants d'âge scolaire des Premières Nations et pour les Autochtones vivant avec le diabète.

Schools of Optometry – Awards and Graduation Écoles d'optométrie – Prix d'excellence et collation des grades

CAO is pleased to support Optometry student members and Schools of Optometry. CAO President, Dr. Lil Linton, was invited to attend Awards Ceremonies and Graduation at Canadian Schools of Optometry in Montreal (June 7) and Waterloo (June 13). In Montreal, CAO contributes to the 'Excellence Awards' which are presented to seven new grads. Six of the winners receive \$1000 and the seventh receives \$2,000 for maintaining the best overall academic record throughout the program. At Waterloo, Dr. Linton presented the CAO Award of Merit to Andrea Lasby and the Dr. Margaret Hansen Desgroseilliers Award (sponsored by the Canadian Optometric Education Trust Fund) was to Steven Hoang.

L'ACO est heureuse d'appuyer des membres étudiants en optométrie et les écoles d'optométrie. La présidente de l'ACO, la Dre Lil Linton, a été invitée à assister aux cérémonies de remise des prix d'excellence et de collation des grades aux écoles canadiennes d'optométrie à Montréal (7 juin) et Waterloo (13 juin). À Montréal, l'ACO contribue aux « Prix d'excellence » présentés à sept nouveaux diplômés. Six des lauréats reçoivent 1 000 \$ et le septième, 2 000 \$ pour avoir maintenu les meilleures notes tout au long du programme. À Waterloo, la Dre Linton a présenté le Prix du mérite de l'ACO à Andrea Lasby et le Prix Dre Margaret Hansen DesGroseilliers (commandité par le Fonds de fiducie des optométristes canadiens pour l'éducation) a été décerné à Steven Hoang.

CURES Study Published

The School of Optometry and Vision Science advised CAO that the study of 'Prevalence of Visual Impairment and Uncorrected Refractive Error' has been published in Ophthalmic Epidemiology. The study was conducted by the School and the Canadian National Institute for the Blind with financial support of CAO, several provincial associations and the Canadian Optometric Education Trust Fund (COETF). The study was the first of its kind in Canada and demonstrates the need for regular eye health examinations. A summary of the study may be found on the Ophthalmic Epidemiology site. The full study may be accessed from the CAO member only site, 'Inside CAO - June, 2013'.

Publication de l'étude CURES

L'École d'optométrie et de sciences de la vision a informé l'ACO que l'étude intitulée « Prevalence of Visual Impairment and Uncorrected Refractive Error » a été publiée dans Ophthalmic Epidemiology. L'étude a été réalisée par l'École et l'Institut national canadien pour les aveugles, grâce à l'aide financière de l'ACO, de plusieurs associations provinciales et du Fonds de fiducie des optométristes canadiens pour l'éducation (FFOCE). L'étude, la première de cette nature réalisée au Canada, démontre la nécessité des examens périodiques de la santé oculovisuelle. On trouve un résumé de l'étude sur le site d'Ophthalmic Epidemiology. Il est possible de consulter la version intégrale de l'étude sur le site Web de l'ACO réservé aux membres, « Inside CAO – juin 2013 ».

Focus on Eye Health National Summit

On June 18, Prevent Blindness America (PBA) held the second annual "Focus on Eye Health National Summit," an event designed to bring leaders in the vision, government, non-profit and public health communities as well as patient advocates together to discuss advancements, research and challenges in the area of vision health. Nearly 200 attendees heard presentations given from a variety of groups including representatives ranging from the Centers for Disease Control and Prevention to the U.S. Census Bureau. Opening the Summit was a presentation from John Wittenborn, NORC at the University of Chicago, on the new report from PBA entitled "Cost of Vision Problems: The Economic Burden of Vision Loss and



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Eye Disorders in the United States." Mr. Dana Cooper, Director, Government Relations and Public Policy, CAO attended the summit to learn and gather information for use in Canada. Visit the PBA Summit web page for the agenda and presentations.

Sommet national Pleins feux sur la santé oculovisuelle

Le 18 juin, Prevent Blindness America a tenu la deuxième édition annuelle de son « Sommet national Pleins feux sur la santé oculovisuelle », événement conçu pour réunir les chefs de file des soins oculovisuels, du gouvernement, du secteur sans but lucratif et des milieux de la santé publique, ainsi que des représentants des patients, pour discuter d'avancées, de recherches et de défis dans le domaine de la santé oculovisuelle. Presque 200 participants ont entendu des exposés de tout un éventail de groupes, depuis les représentants des centres de prévention et de lutte contre la maladie jusqu'au Bureau du recensement des États-Unis. John Wittenborn, NORC à l'Université de Chicago, a ouvert le Sommet en présentant un exposé sur le rapport de PBA intitulé « Cost of Vision Problems: The Economic Burden of Vision Loss and Eye Disorders in the United States ». M. Dana Cooper, directeur des Relations avec les gouvernements et de la politique publique de l'ACO, a assisté au Sommet pour réunir de l'information à utiliser au Canada : <http://pba.convio.net/site/PageServer>

Optometry in Brazil

On June 19, the Brazilian Congress approved a Bill that seeks to regulate the medical profession. This piece of legislation has been under discussion for the last 11 years. The Brazilian Council of Optometry and Optics (CBOO) was working tirelessly to get optometry recognised as a health care profession that contributes to comprehensive and multidisciplinary

eye health and vision care. Brazilian optometrists and other non-medical health professionals are concerned about the impact that this Bill could have on their scope of practice and even their ability to practice at all. The World Council of Optometry believes that restricting Optometry to only acting under the supervision of a medical doctor will severely limit the right of people to immediate and affordable access to health care. WCO asked member organizations, including CAO, to write the Brazilian President to raise our concerns. On July 7, 2013 CAO was pleased to learn that the President of Brazil vetoed the part of the Bill that impacts optometry. Although the battle has not finished, the outcome is very positive.

L'optométrie au Brésil

Le 19 juin, le Congrès brésilien a approuvé un projet de loi visant à réglementer la profession médicale. Cette mesure législative était à l'étude depuis 11 ans. Le Conseil

brésilien de l'optométrie et de l'optique (CBOO) a cherché sans relâche à faire reconnaître l'optométrie comme profession de la santé qui contribue à la santé oculovisuelle et à des soins de la vue complets et multidisciplinaires. Les optométristes du Brésil et d'autres professionnels de la santé non médecins sont préoccupés par l'effet que cette mesure législative pourrait avoir sur leur champ d'exercice, voire leur capacité même de pratiquer. Le Conseil mondial de l'optométrie est d'avis qu'en assujettissant l'optométrie à la surveillance d'un docteur en médecine, on limitera considérablement le droit des gens à avoir un accès immédiat et abordable aux soins de santé. Le CMO a demandé à ses organismes membres, y compris à l'ACO, d'écrire au président du Brésil pour lui faire part de nos préoccupations. Le 7 juillet 2013, l'ACO s'est réjouie d'apprendre que le président du Brésil a opposé son veto à la partie du projet de loi qui a une incidence sur l'optométrie. Même si la lutte n'est pas terminée, le résultat est très positif.



Vision Health Month & Toonie Campaign

CNIB reported that the 2013 Vision Health Month campaign generated positive results in relation to the original campaign objectives, over-delivering on expectations/targets in a number of key areas. Both partner brands (CNIB and Doctors of Optometry Canada) received a high degree of visibility across all activities, helping build awareness while publicly reinforcing and celebrating the close connection between the optometry profession in Canada and CNIB. Meanwhile, early results from the Toonie Campaign appear favourable, and CNIB anticipates once all donations have been received that last year's results will have been exceeded.

CAO members who have not yet submitted to the Toonie Campaign may still do so. Go to eyesareforlife.ca/tooniecampaigh. For more information, Email: tooniecampaigh@doctorsofoptometry.ca

CAO Business Meeting

The CAO Business meeting was held on Saturday, July 13 in conjunction with the CAO Biennial Congress. There was a good turnout of CAO members and guests. A CAO report to members was circulated with minutes from the 2011 General Business Meeting. The agenda also included reports from Dr. Mitchell Munson, President, American Optometric Association, Dr. Susan Cooper, President, World Council of Optometry, Dr. Jeff Goodhew and Ms. Patti Schom-Moffatt, National Public Education Committee and Mr. Dana Cooper, Director of Government Relations and Public Policy. Outgoing CAO President, Dr. Lil Linton presented a gavel to incoming President, Dr. Paul Geneau, who spoke about his upcoming term. A copy of the member report and PowerPoint presentations are available on the CAO member website, 'Inside CAO'.

PROCUREMENT OPPORTUNITY

Public Works and Government Services Canada (PWGSC), on behalf of the Department of National Defence (DND), is anticipating a procurement for the provision of optical supplies and services for up to 28 Canadian Forces locations across Canada. The procurement will be publicly posted at Buyandsell.gc.ca/tenders. To learn more about doing business with the Government of Canada and accessing procurement opportunities, please contact the PWGSC Procurement Support Line at 1-855-886-3030 (TTY: 1-800-465-7735). To be notified when this opportunity is posted or for additional information on DND's requirement, please contact PWGSC at Optique.Optical@tpsgc-pwgsc.gc.ca.

VIC Annual Fall Conference Conférence annuelle automnale du VIC



November 15-17, 2013 | 15 au 17 novembre 2013

The Vision Institute of Canada (VIC) will be hosting its Annual Fall Conference and Trade Show in Markham, Ontario from November 15-17, 2013. Registration is now open and information is available at visioninstitute.optometry.net. This three day program will have a special focus on the diagnosis and treatment of glaucoma. There will also be an inaugural Scientific and Research Poster Display as a new teaching and learning opportunity for Canadian optometrists.

Le Vision Institute of Canada (VIC) tiendra cette année sa conférence annuelle automnale à Markham ON, du 15 au 17 novembre 2013. L'inscription est maintenant ouverte et de l'information est disponible à visioninstitute.optometry.net. Ce programme de trois jours portera particulièrement sur le diagnostic et le traitement du glaucome. Il y aura aussi une première exposition d'affiches scientifiques et de recherche comme nouvelle occasion d'enseignement et d'apprentissage offerte aux optométristes du Canada.

Assemblée d'affaires de l'ACO

L'ACO a tenu son assemblée d'affaires le samedi 13 juillet, dans le contexte de son Congrès biennal. Le Congrès a attiré beaucoup de membres de l'ACO et d'invités. Le rapport de l'ACO a été distribué avec le procès-verbal de la séance générale de 2011. L'ordre du jour incluait aussi des rapports du Dr Mitchell Munson, président de l'American Optometric Association, de la Dre Susan Cooper, présidente du Conseil mondial de l'optométrie, du Dr Jeff Goodhew et de Mme Patti Moffatt-Schom, du Comité national d'éducation publique, et de M. Dana Cooper, directeur des Relations avec les gouvernements et de la politique publique. La présidente sortante de l'ACO, la Dre Lil Linton, a présenté le nouveau président, le Dr Paul Geneau, qui a parlé de son mandat à venir. Une copie du rapport aux membres et de la présentation PowerPoint est disponible sur le site Web des membres de l'ACO, à la section « Inside CAO ».

Join the Global Campaign for Universal Eye Health!

Optometry Giving Sight, the International Charity of Choice of the CAO, would like to invite you to participate in the World Sight Day Challenge during October. It is the largest annual global fundraising campaign to address avoidable blindness caused by uncorrected refractive error – simply the need for an eye exam and glasses.

We believe that the World Sight Day Challenge is a very positive campaign, because preventable blindness is a solvable problem. We provide long term sustainable solutions. You may be surprised to learn that just \$5 can be enough to help provide an eye exam and a pair of glasses to someone living in an under-served community. Every contribution is meaningful.

Participating is easy – simply make a single or monthly donation before the end of October. Optometry practices can also be creative and engage patients, customers and staff with fundraising events throughout the Challenge period. This year there are new "people power" wristbands so that patients and employees can make a donation and publicly show their

support for the campaign. We'd love for you to join us, and help raise urgently needed funds for this great cause. Sign up online at <http://www.givingsight.org/get-involved/world-sight-day-challenge.html> or call 1-800-585-8265 ext 4.

Joignez-vous à la campagne internationale pour la santé oculovisuelle universelle!

L'organisme de bienfaisance international choisi par l'ACO, Optometry Giving Sight, aimerait vous inviter à participer au défi de la Journée mondiale de la vue en octobre. Il s'agit de la plus grande campagne annuelle internationale de financement visant à éliminer la cécité évitable causée par une erreur de réfraction non corrigée, qui répond simplement au besoin d'un examen de la vue et d'une paire de lunettes.

Nous croyons que le défi de la Journée mondiale de la vue est une campagne très positive parce que la cécité évitable est un problème soluble. Nous offrons des solutions durables à long terme. Vous serez peut-être surpris d'apprendre que 5 \$ peuvent être suffisants pour offrir un examen de la vue et une paire de lunettes à une personne vivant dans une collectivité mal desservie. Chaque contribution est importante.

Vous pouvez participer facilement, simplement en faisant un don unique ou mensuel avant la fin d'octobre.

Les cabinets d'optométrie peuvent aussi être créatifs et mobiliser les patients, les clients et le personnel au moyen d'activités de financement durant la période du défi. Cette année, de nouveaux bracelets portant la mention « people power » (le pouvoir des gens) permettent aux patients et aux employés de faire un don et d'afficher publiquement leur soutien à la campagne.

Nous vous invitons à vous joindre à nous pour nous aider à amasser des fonds indispensables à cette bonne cause. Inscrivez-vous en ligne à <http://www.givingsight.org/get-involved/world-sight-day-challenge.html> ou composez le 1-800-585-8265, poste 4.

Optometric Assistant Course

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Enhance the delivery of vision-related health care services. The Optometric Assistant Course (OAC) is structured to provide assistants with in-depth knowledge and practical skills training for key areas within an optometric setting. OA's with a CCOA designation are widely recognized as being trained to deliver a higher level of patient care, demonstrate confidence and experience increased job satisfaction.

FOR MORE INFORMATION:

Contact Lise Loyer, CCOA, National Director, OAC at: lise@opto.ca, or visit www.opto.ca/oa

Registration - Optometric Assistant Course

CAO recommends that delegated duties allowed by your provincial licensing authority be handled by skilled personnel with a certain standard of education and formal certification. As a CAO member, you are eligible to enroll your staff in the Optometric Assistant Course program. An investment in staff training translates to a higher level of care for patients as well as increased skills confidence, retention, and job satisfaction among your staff.

There are two educational streams offered through the Optometric Assistant Course;

- (1) Individual Module (register at any time): Choose from one of the 4 Modules, 8-12 weeks duration each. Successful registrants receive a certificate of completion for each Module.
- (2) Full Course (October-July): Includes all 4 Modules, 3-day Workshop, and Final Exam. Successful registrants obtain a certification of CCOA (Canadian Certified Optometric Assistant). Annual registration began August 1.

The duties of an optometric assistant are very diverse and require a high-level skill set in many areas. The focus of the Full Course is to provide in-depth training in the key areas of an optometric setting, whereas Individual Modules target specific topics.

Full Course Registration: (Term: Oct 1st - Jul 31st.)

Registration: To enrol in the Optometric Assistant Course, the assistant must be currently employed by a CAO member optometrist, and remain employed by the optometrist throughout the duration of the course. Current rates are available on the registration form. Details are available at opto.ca/oa/oac-registration.

Please register before October.



Le Mois de la santé visuelle et la Campagne de la pièce de 2 \$

L'INCA a signalé que la campagne du Mois de la santé visuelle de 2013 a produit des résultats positifs par rapport à ses objectifs initiaux, dépassant les attentes/objectifs dans un certain nombre de domaines clés. Les deux marques partenaires (INCA et Docteurs en optométrie Canada) ont bénéficié d'une grande visibilité dans toutes les activités, ce qui a aidé à les faire mieux connaître tout en renforçant et célébrant publiquement les liens serrés qui existent entre la profession optométrique au Canada et l'INCA. Entre-temps, les premiers résultats de la Campagne de la pièce de 2 \$ semblent favorables et l'INCA prévoit que lorsque tous les dons auront été reçus, on dépassera les résultats de l'an dernier.

Les membres de l'ACO qui n'ont pas encore participé à la Campagne de la pièce de 2 \$ peuvent toujours le faire. Rendez-vous à moisdelasantevisuelle.cnib.ca Pour en savoir davantage : un2dollarspourinca@docteursenoptometrie.ca

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CAO is pleased to announce that as of September 1st, 2013 Zomaron will be our new preferred provider of merchant services for credit card and INTERAC transactions, replacing Chase Paymentech. Zomaron was founded in London, Ontario and is a 100% Canadian owned and operated, offering a suite of transaction processing solutions with a CAO preferred discount rate of 1.59% for VISA and MasterCard, for qualified transactions. Authorizations and INTERAC Debit will cost \$0.049 per transaction. There is a monthly fee of \$4.95 and you can own your terminal from \$24.95/month over 60 months or buy it outright for \$1095 plus tax. For more information and to apply, contact Zomaron at 1-888-900-9192 ext. 765 or e-mail CAO@zomaron.com.

Zomaron services aux commerçants

L'ACO est heureuse d'annoncer qu'à compter du 1er septembre 2013, Zomaron sera notre nouveau fournisseur préféré de services aux marchands pour le traitement des transactions de cartes de crédit et d'INTERAC, en remplacement de Chase Paymentech. Fondée à London, Ontario, Zomaron est une entreprise entièrement canadienne exploitée par des intérêts canadiens, qui offre un ensemble de solutions de traitement des transactions à un taux préférentiel pour l'ACO de 1,59 %, pour les opérations vérifiées sur les cartes VISA et MasterCard. Les autorisations et le débit Interac coûteront 0,049 \$ par transaction. Il y a des frais mensuels de 4,95 \$ et vous pouvez vous procurer votre propre terminal à 24,95 \$/mois sur 60 mois ou l'acheter d'emblée pour 1095 \$ plus taxes. Pour en savoir davantage et pour faire une demande, communiquez avec Zomaron au 1-888-900-9192, poste 765 ou par courriel à CAO@zomaron.com.

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Plus assessments fees passed through at cost

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Plus assessments fees passed through at cost



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Congress in Pictures





"I cannot think of one thing that could have made it more perfect."
 – Glenn Campbell

Congress in Pictures



The 33rd CAO Biennial Congress in Edmonton was described by many people as one of the best. We were certainly blessed with a great team of individuals whose only goal was to put together a memorable Congress. We would like to sincerely thank those who attended and those who provided us with valuable advice and feedback. Without that, all the planning would have been futile. Once again, thank you very much.

Sincerely,
Dr. Femida Visnani & Dr. Larry Gies, Co-chairs



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Lens Protection And All-day Comfort

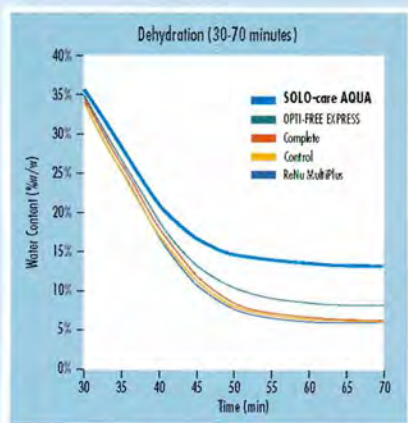
By Shalu Pal, OD, FAAO
Toronto, Canada

Choosing the right lens and pairing it with proper lens care is important. At a minimum, a cleaning and disinfecting system must be safe for the ocular surface, effective at eliminating pathogenic microorganisms, and it must enhance lens comfort. The SOLOCARE AQUA® Lens Care System provides an extra safety component for added benefits for patients.

Safety, efficacy and comfort

SOLOCARE AQUA® All-in-One Solution has a proven track record as a safe and effective soft lens care solution. Polyhexanide (0.0001%) is the preservative and disinfectant in this solution. Its unique chemical structure selectively attacks the cell walls of microorganisms. Polyhexanide binds to clearly exposed phospholipids on the outer plasma membranes of microorganisms. The result is a safe ocular surface.¹

SOLOCARE AQUA® contains two key comfort ingredients. Provitamin B5 (dexpanthenol) surrounds the lens and adds moisture, and sorbitol absorbs and binds moisture to the lens. Together, these agents create the HydroLock™ effect that locks in moisture to improve hydration for all-day comfort (figure 1) SOLOCARE AQUA® is well accepted by patients, who report high levels of comfort according to studies by Amos in 2004 and Miller and Dillehay in 2007.

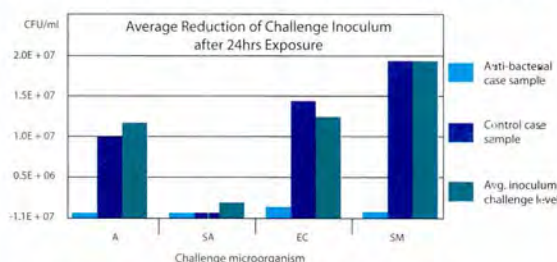


► Figure 1. Laboratory test with vifilcon A lenses (55% water content) recreates a real-world dry-air environment similar to an air-conditioned or heated office.

Antimicrobial silver ions

Often, the most forgotten part of a good lens care regimen is the lens case. Many microorganisms secrete a protective membrane, a biofilm, when they come in contact with a surface. This biofilm renders the microorganism resistant to disinfectants in contact lens solutions.²

Antibacterial MicroBlock® lens case kills bacteria on contact



Efficacy of an Anti-Microbial Lens Case, Melanie George MS, Marc Ajello BS, Mark Tsao PhD, Allen Gillard BS and Alicia Sills MS - CIBA Vision Corporation, Duluth, GA - A Novartis Company

► Figure 2.

Various studies have shown that 20% to 80% of lens cases are contaminated with bacteria, fungi and other pathogenic organisms, and their biofilms render solutions ineffective against them. The result is pathogenic transfer to the corneal surface when lenses are applied.

SOLOCARE AQUA® breaks down this barrier with its unique MicroBlock® case. The case and cap are impregnated with antimicrobial silver ions that reduce bacterial contamination and development of biofilms.^{3,4}

Contact lens cases should be rinsed with the multipurpose solution being used, but, unfortunately, most patients rinse their cases with tap water. The bacteria in water is the primary source of bacteria buildup in lens cases. The MicroBlock® case not only destroys water-borne microorganisms but also prevents the growth of new bacteria.

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The MicroBlock® lens case has been shown to kill *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Escherichia coli* and *Serratia marcescens* (figure 2).⁵

Safety boost

Good lens hygiene and the right products play key roles in minimizing the risks of corneal infection. Unfortunately, more than 50% of patients do not adhere to the proper lens care regimens prescribed.^{6,7} With its unique MicroBlock® lens case, SOLOCARE AQUA® provides an extra measure of safety by locking out bacteria and minimizing biofilms. With more than 8 years of clinical experience behind it, SOLOCARE AQUA® is the only system that offers an efficacious combination of excellent comfort and extra safety.

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Elevating the Importance of UV Protection for Kids.....



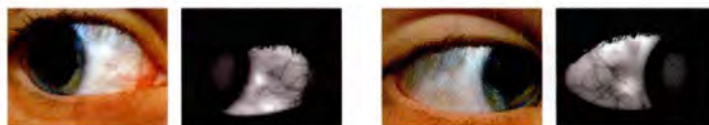
The need for sunscreen to protect the skin is understood in the general population; however there is a huge lack of awareness of the importance of protecting the eyes from UV radiation (UVR). Only 7% of people associate UVR with eye problems.¹ The harmful effects of UVR to the ocular structures have been well-documented.^{2,3} There is a significantly higher chance of exposure to the ocular structures during the childhood years.

Researchers estimate that a significant amount of lifetime exposure to UV rays may occur by age 18. The effects of UV damage are cumulative. Children spend more time outside than adults and often without sunglasses. They also have larger pupils and clearer crystalline lenses than adults. UVR can cause alterations to epithelium, cortex and nucleus of the lens at a young age, causing more susceptibility to cataracts and ARMD later in life.^{4,5} In fact, the American Academy of Pediatrics' Committee on Environmental Health stated that "Infants and children aged <10 years may be at increased risk of retinal injury because the transmissibility of the lens to damaging visible blue light and UV light is greatest during this period".⁶ If children are not wearing wrap-around glasses and a wide-brimmed hat, they are susceptible to ocular damage.

Ultraviolet photography has detected UV damage to the conjunctiva in patients as young as 9 years of age.⁷ Figure 1 demonstrates ocular surface changes in an 11-year-old girl. The areas of fluorescence correlate to areas of UV damage.⁸

Figure 1

Ocular Surface Changes Begin Early 11-year-old girl



Age Group	Number with Changes	Percentage
3-8 Years	0/27	0
9-11 Years	6/23	29
12-15 Years	17/21	81

UV protection is required in any season and during all daytime hours. Japanese researchers found that UV exposure to the eye is greater in the early morning and late afternoon in the spring, summer and fall.⁹ In fact, the exposure in the morning was approximately double of that received in the mid morning to early afternoon, the time of day usually associated with the strongest UV radiation.⁸ Few realize that the patterns of UV exposure to the eyes can vary from exposure to the skin.



ACUVUE[®] Brand Contact Lenses are the only major brand which blocks at least 97% of UVB and 81% of UVA rays, as standard across the entire line.^{†‡}

UVR and Contact Lenses

Most soft contact lenses provide little or no UV protection. ACUVUE[®] Brand Contact Lenses are the only major brand which blocks at least 97% of UVB and 81% of UVA rays, as standard across the entire line.^{†‡} Many patients are unaware that contact lenses are capable of providing any defense against UVR. For children who are fit with contact lenses, UV protection provides an additional benefit when worn with sunglasses. Also, these contact lenses can protect the covered portions of the eye from peripheral light focusing effect (PLF).¹⁰ PLF is the phenomenon described when UV rays hit the eye from the side resulting in the refraction of light by the corneal dome. The intensity of light is then received by the nasal limbus and can be 20 times more intense than the incident light.¹⁰ PLF can compromise the conjunctival and limbal stem cells.¹⁰ Many sunglass designs provide no protection against PLF. It should be noted, however, that contact lenses do not provide protection for the eyelids or the conjunctiva outside the borders of the lens. Therefore, contact lens wearers should continue to wear sunglasses and a wide-brimmed hat to receive full ocular protection from UVR.

How Should We Be Protecting Kids' Eyes?

Education in our offices and to the public is critical to increase the awareness of the hazards of UVR to the eyes. The lack of knowledge of the general population on the effects of UV damage to the eyes is troublesome. Every patient should be educated on the importance of UV protection throughout the year. Children, particularly, should be recommended to wear wrap-around sunglasses with 99-100% UVA and UVB protection. Impact resistant lenses and wide-brimmed hats or baseball caps are also highly recommended. If patients wear contact lenses, consider fitting contact lenses with UV protection for additional benefits. By educating parents and children, as well as the general public, hopefully we can make behavioural changes to reduce the cumulative effects of UV damage.

Vishakha Thakrar, OD, FAAO,
Professional Affairs Consultant
Johnson & Johnson Vision Care, Inc.



Δ UVB and UVA blocking percentages are based on an average across the wave length.

†Helps protect against transmission of harmful UV radiation to the cornea and into the eye.

WARNING: UV-absorbing contact lenses are NOT substitutes for protective UV-absorbing eyewear such as UV-absorbing goggles or sunglasses because they do not completely cover the eye and surrounding area. You should continue to use UV-absorbing eyewear as directed. NOTE: Long-term exposure to UV radiation is one of the risk factors associated with cataracts. Exposure is based on a number of factors such as environmental conditions (altitude, geography, cloud cover) and personal factors (extent and nature of outdoor activities). UV-blocking contact lenses help provide protection against harmful UV radiation. However, clinical studies have not been done to demonstrate that wearing UV-blocking contact lenses reduces the risk of developing cataracts or other eye disorders.

ACUVUE[®] Brand Contact Lenses are indicated for vision correction. As with any contact lens, eye problems, including corneal ulcers, can develop. Some wearers may experience mild irritation, itching or discomfort. Lenses should not be prescribed if patients have any eye infection, or experience eye discomfort, excessive tearing, vision changes, redness or other eye problems. Consult the package insert for complete information. Complete information is also available from Johnson & Johnson Vision Care, Division of Johnson & Johnson, Inc., by calling 1-800-267-5098 or by visiting www.acuvueprofessional.ca.

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Oral fluoroquinolones and retinal detachment

Key Points

- According to a pharmacoepidemiological study, current use of oral fluoroquinolones was associated with an increased risk of developing retinal detachment.
- Health Canada received one report of retinal detachment suspected of being associated with an oral fluoroquinolone.
- Health care professionals are encouraged to report to Health Canada any adverse reactions suspected of being associated with oral fluoroquinolones, and related to the development of retinal detachment.

Oral fluoroquinolones are broad-spectrum antibacterial drugs indicated for the treatment of infections caused by susceptible strains of microorganisms.^{1,2,3,4,5} In Canada, there are five marketed oral fluoroquinolones: ciprofloxacin (first marketed in 1996), levofloxacin (1997), moxifloxacin (2000), norfloxacin (1986), and ofloxacin (1990). The risk of retinal detachment is not described in any of the oral fluoroquinolone Canadian product monographs.

Retinal detachment is characterized by a separation of the retina from the underlying tissue in the eye.⁶ Among the different types of retinal detachment, rhegmatogenous retinal detachment (RRD) is the most common. RRD results from retinal breaks caused by vitreoretinal traction. Risk factors commonly associated with retinal detachment include advancing age, previous cataract surgery, myopia and trauma. Patients generally present with symptoms such as light flashes, floaters, peripheral visual field loss and blurred vision. Retinal detachment is a serious medical emergency that generally requires prompt surgical intervention.^{6,7}

According to a pharmacoepidemiological study, current use of oral fluoroquinolones was associated with an increased risk of developing retinal detachment.⁷ Ophthalmic fluoroquinolones were excluded from the study to avoid reverse causality bias. The study identified 445 cases of retinal detachment involving oral fluoroquinolone use in a cohort of 989,591 patients from British Columbia who visited an ophthalmologist between January 2000 and December 2007. Further research is needed to confirm whether there is a potential association between retinal detachment and fluoroquinolones as well as to clarify the mechanism of action.

As of Dec. 31, 2012, Health Canada received one report of retinal detachment suspected of being associated with the use of an oral fluoroquinolone. The report described a 52-year-old woman who experienced retinal detachment after a course of ciprofloxacin prescribed to treat a bladder infection. Limited evidence linking retinal detachment to oral fluoroquinolones may explain the low level of reporting to Health Canada.

Health care professionals are encouraged to report to Health Canada any adverse reactions (ARs) suspected of being associated with oral fluoroquinolones, and related to the development of retinal detachment. Information such as treatment duration, dosage, current or previous exposure to oral fluoroquinolones, as well as symptoms related to retinal detachment such as light flashes, floaters and peripheral visual field loss are important to include when reporting ARs. This information may help to further evaluate AR reports related to retinal detachment suspected of being associated with oral fluoroquinolone use.

– Alain Beliveau, PhD, Health Canada

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Source: **Beliveau A.** Oral fluoroquinolones and retinal detachment. *Canadian Adverse Reaction Newsletter* 2013;23(3):1-2.

In Memoriam

Our sincere condolences and wishes go out to the Jervis family for the loss of **Dr. Herbert William (Bert) Jervis**. Dr. Jervis passed away May 24th, 2013 at the age of 87 at his home on Pender Island. Bert is survived by his wife Daphne and their three children Brian, Colleen, and Tim, his brother Fred, his sister Dorothy and many grandchildren and great grandchildren.

Born in Vancouver, Dr. Jervis practiced optometry in West Vancouver for over 50 years. BCAA President from 1955 - 1957, Dr. Jervis compiled the History of Optometry in British Columbia and was inducted as a BCAA Honorary Life member in 1999.

At various times throughout his life, he worked at Shaughnessy Hospital, the School of Optometry at the University of Waterloo in Ontario, and at the Pender Island Health Centre.

In Memoriam

With great sadness we announce the sudden passing of **Dr. Sherman Olson**. Dr. Olson passed away on June 9th, 2013 at the age of 85.

Born in Tuberoso, Saskatchewan, Dr. Olson studied science in Vancouver and optometry in Chicago. After obtaining his degree, he returned to BC and purchased a practice in Maple Ridge.

BCAO President from 1975-1977, Dr. Olson served on the Board of Examiners for 14 years and was an active force in creating BCAA's OPTOFAIR. Dr. Olson also collaborated with BCAA on a mobile clinic during the late 70's and into the early '80's. In 2000, Dr. Olson was inducted as a BCAA Honorary Life member. Dr. Olson was also a Honorary Life Member with the College of Optometrists of BC and continued to be involved with College committees.

Active in his community, Dr. Olson founded the Horse Council of BC (serving as President for 10 years), Vancouver Neurological Centre, and Trails BC (1995). Our sincere condolences and wishes go out to the Olson family.



Craig Gives Back-2-Back Cross Canada Bicycle Tour

Craig Aucoin is the first blind cyclist to attempt a cross-Canada trek on a unique two-wheeled bicycle. On August 4th, Craig Aucoin and Lloyd McLean embarked on an 85-day, 8,200 km journey. The tour began in St. John's, NL and concludes on October 27, 2013. He aims to raise over \$300,000 for three Canadian charities that have had a profound impact on his life: CNIB, Canadian Guide Dogs for the Blind, and the YMCA.

Craig has Choroideremia. When he turned 15, his eye condition deteriorated so much that he could no longer participate in team sports or actively play with other kids. His lack of physical activity and social interaction left him feeling isolated and depressed, resulting in significant weight gain over the course of several years and into his early twenties. Since then, Aucoin has dramatically changed his life. He has completed seven triathlons. Along with his friend and cycling partner Lloyd McLean, they've prepared for this event by training on a stationary bicycle a distance equal to the cross-country journey.

Ten days after setting off Craig injured his hand and has been in a cast which is expected to come off in early September. While Craig is recovering from injuries Bob MacDonald (who has Retinitis Pigmentosa) has been biking with Lloyd to continue the Craig Gives Back tour. Craig will be re-joining the tour in Ottawa in early September. Craig is encouraging people in communities across Canada to engage in fundraising activities, or simply donate to the three charities in the name of the tour. Come show your support for the Craig Gives Back Tour by attending a mini-reception in your local community, or by biking or running alongside Craig and Lloyd!

A schedule with city stops is posted on their webpage. To find out more, and learn how to donate please visit:
craigsgivesback.ca



The "Janus" tandem recumbent bicycle is custom made in Holland and the first of its kind in Canada.

Alcon Canada Receives Approval for JETREA™ (Ocriplasmin) Solution for Intravitreal Injection, the First and Only Eye Medicine to Treat Sight-threatening, Symptomatic Vitreomacular Adhesion

What is JETREA™?

JETREA™ is the first and only eye medicine to treat the age-related, progressive and sight-threatening condition, symptomatic vitreomacular adhesion (VMA). Alcon, the global leader in eye care and a division of Novartis, received approval of JETREA™ (ocriplasmin) solution for intravitreal injection from Health Canada on August 13, 2013.

JETREA™ intravitreal injection represents a breakthrough for patients with symptomatic vitreomacular adhesion. If left untreated, it can be responsible for retinal distortion, decreased visual acuity and vision deterioration, with the potential to cause irreversible vision loss or blindness.^{1,2,3,4,5,6}

JETREA™ (ocriplasmin), a recombinant form of human protein (plasmin), works by targeting the protein fibers that cause the abnormal pull between the vitreous and the macula of the eye. By dissolving these proteins, JETREA™ separates the vitreous from the macula, releasing the vitreomacular adhesion.^{2,8} This one-time intravitreal injection has been shown to successfully resolve VMA.^{1,2}

"We are very proud to be bringing JETREA™ to patients in Canada. JETREA™ is a major breakthrough for people living with VMA and eye care professionals who, until now, have only had surgical options available to treat this debilitating eye disease. Now, they have the option of early treatment with a one-time injection of JETREA™, often before their condition deteriorates," said Alex Long, General Manager of Alcon Canada.

The Phase III studies, published in the *New England Journal of Medicine*, showed that patients who were treated with JETREA™ (ocriplasmin) successfully achieved resolution of VMA as compared to placebo at day 28.¹ By day 28, 26.5% of the patients treated with JETREA™ achieved resolution of VMA (versus 10.1% with placebo [$P < 0.001$]).¹

Side effects observed in the Phase III studies of JETREA™ (ocriplasmin) were consistent with the release of traction and intravitreal injections. The most common Adverse Drug Reactions were consistent with pharmacologic vitreolysis, such as vitreous floaters, photopsia, or were due to inflammation/irritation resulting from either the injection procedure and/or the drug. These were generally considered mild to moderate and were resolved without complications.¹

JETREA is a trademark of ThromboGenics N.V., licensed to Alcon.

Alcon acquired the rights to commercialize JETREA™ injection outside the United States from the Belgian biopharmaceutical company, ThromboGenics, which retains the rights to commercialize the drug in the US. In October 2012, JETREA™ intravitreal injection was approved in the US for the treatment of patients with symptomatic VMA. European approval for JETREA™ (ocriplasmin) was granted in March 2013 for the treatment of vitreomacular traction (VMT), including when associated with macular hole equal to or smaller than 400 microns. Healthcare professionals can access more information at www.jetreahcp.com.

What is Vitreomacular Adhesion?

Vitreomacular adhesion, or VMA, is an age-related, progressive and sight-threatening condition.

As people get older, the vitreous (jelly-like material inside the eye that helps maintain the round shape) detaches naturally from the retina (the light-sensitive layer of tissue located at the back of the eyeball).^{1,3} This detachment is part of the natural aging process and is common over the age of 50.

However, sometimes the vitreous remains attached to some areas of the retina, particularly at the macula, which is the area of the retina responsible for central vision needed for everyday tasks, such as driving, reading and recognizing faces. This is known as vitreomacular adhesion (VMA).^{1,3}

If left unresolved, these areas of VMA can exert a 'pulling force' on the macula, a condition referred to as vitreomacular traction (VMT). In some cases,

the pulling due to VMT may eventually tear the macula, leading to the formation of a macular hole.^{2,13} Symptomatic VMA is a progressive condition that is often responsible for retinal distortion and deterioration in vision, and has the potential to cause irreversible damage and vision loss.^{3,4,5,6} It is estimated to affect up to 15,000 people in Canada each year.⁷

About Alcon

Alcon, the global leader in eye care, provides innovative products that enhance quality of life by helping people worldwide see better. The three Alcon businesses - Surgical, Pharmaceutical and Vision Care - offer the widest spectrum of eye care products in the world. Alcon is the second largest division of the Novartis Group, with pro-forma sales of USD 10.2 billion in 2012. Headquartered in Fort Worth, Texas, USA, Alcon has more than 24,000 employees worldwide, operations in 75 countries and products available in 180 markets. For more information, visit www.alcon.com.

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Team building with The Marshmallow Challenge



In any high quality service business, the only long-term competitive advantage is a well-trained and highly motivated team. Team members who are fully engaged in providing superior service are the best investment an optometric practice can make. Yet building a team is no easy task.

Many OD's find in the realm of practice management that HR — Human Relations creates the most stress for them. There are many aspects to HR. I will address how to hire smarter in a future article. Let's discuss a very powerful, inexpensive tool to help you build a stronger, and more cohesive team using your current office talent. Believe it or not, the only materials you will need for this team motivating exercise is a package of spaghetti (uncooked), a bag of regular marshmallows, masking tape and some string. Plus, it will help to have a measuring tape, a timer, and optionally a sound system and video projector. If you don't have a video projector, connect a PC to a TV or a large monitor. If you don't have a timer, you might consider setting up a laptop computer or tablet device with a digital timer large enough for your team to see.

Go to the website: **marshmallowchallenge.com** and read the instructions. Then on this website or at **TED.com** watch the instructional video. Download the free video from the TED.com website for your own use, so that later you won't have to rely on a fast internet connection. Reserve an hour for a team meeting with a single purpose — *to improve the creative talents of your team*. Follow the proven rules established to run the "Marshmallow Challenge." You will have an engaged group for the meeting. You will all have fun and you will learn how to work together better.

Peter Skillman is the actual genius behind this training tool which was first developed to help people create better designs. The TED video features Tom Wujec, a Fellow at the software company Autodesk, who has run this program for many industries over the last several years. Today, we in healthcare require creative team thinking and original ideas. Use this program to help your team develop the capacity to come up with fresh solutions to the challenges your office faces.



BY GERRY LEINWEBER, OD, BSC

I have learned a lot by running the challenge a number of times. In addition to the instructions provided, I offer some practical guidance as follows:

1. Prepare for the meeting by watching the video, and assembling the materials.
2. Do not carry on other business at this meeting. Devote one hour to this program. Ensuring a full hour office meeting will allow time for a discussion.
3. Read all the step by step notes on the website. You will want to print them to refer to, when questions come up, so that you can provide answers as the clock winds down.
4. Don't store the marshmallows in your staff area. They could be eaten early!
5. Download the video to show to your staff to stimulate discussion. (This is easy to do from the TED website.)
6. After the challenge, show video in two halves & discuss the results with your team.
7. Follow the rules — don't use miniature marshmallows or linguini!
8. Follow-up with a second session three to four months later, mixing up the teams to see how skills improved.

9. One doctor or an office manager should be the administrator and not be on any team. This person should help explain the rules, run the timer, change the music, and keep the process moving along.

It is important to number off your team and mix up who is on each team. In our office we had 16 team members, so we went around the room and had the participants call out their number – #1 through #4 in sequence. In the end we had four teams of four. Ideal team sizes are three or four people. This results in more

random teams. In order to have only one doctor or office manager per team, you can have them number off first. This ensures a good mix of people with various problem solving skills.

The learning really begins when you discuss the process of team building after the winning team has been determined. Seek out the opinions of all participants by asking open ended questions that link to your office mission or brand promise. Give out some prizes. A computer printed certificate is great and works well. Gift cards work in small amounts. Avoid cheap

little junk prizes, remembering that some people don't like coffee or a specific store. Simply use your own best judgement.

To sum it up — *Optometry in the 21st Century is a TEAM sport*. Optometric team training can be boring. Make your office training fun. Hold a Marshmallow Challenge. Ensure your meetings are more productive by involving similar creative training tools on a regular basis. The Marshmallow Challenge is a great tool any office can use twice a year to have fun and build a stronger team.

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Amendments to the Optometry Act Allow Optometrists to Prescribe Medication in **Manitoba**

The Manitoba Association of Optometrists is happy to report that new legislation came into effect July 15th in Manitoba that will allow optometrists to prescribe and administer drugs to people with certain eye conditions. Qualified optometrists are now able to prescribe and administer certain drugs to treat eye infections, glaucoma, uveitis, dry eye and ocular allergies and will be able to work collaboratively with ophthalmologists in treatment of more serious eye disease. The Optometry Amendment Act expands the scope of practice of optometrists so they may remove superficial foreign bodies from the eye, and order and receive screening and diagnostic tests.

"This is great news for our patients and everyone in Manitoba," noted Dr. Neil Campbell, president of the Manitoba Association of Optometrists. "Most of our members have been educated and trained to prescribe medications for years. We are pleased that the Manitoba government has made changes that will broaden access to medically necessary services across the province."

The enactment now means that TPAs may be used and prescribed in all provinces and the Yukon.

The following drugs are specified:

- (a) topical mydriatics;
- (b) topical cycloplegics;
- (c) topical anaesthetics for non-prescription use;
- (d) topical miotics;
- (e) topical and oral anti-allergics;
- (f) topical anti-dry eye agents;
- (g) topical hyperosmotics;
- (h) topical non-steroidal anti-inflammatory drugs;
- (i) topical steroids for all indications except for the following:
 - (i) a topical steroid must not be used in the setting of a corneal ulcer with an epithelial defect
 - (ii) a topical steroid may only be used for the treatment of uveitis if the optometrist consults and collaborates with an ophthalmologist in accordance with the by-laws
- (j) anti-infectives:
 - (i) topical antibiotics
 - (ii) oral antibiotics for the treatment of chronic eyelid disease if the optometrist consults and collaborates with a physician
 - (iii) topical anti-viral drugs;
- (k) the following anti-glaucoma medications:
 - (i) topical anti-glaucoma medications if the optometrist consults and collaborates with an ophthalmologist

in accordance with the by-laws

- (ii) topical or oral anti-glaucoma medications for the treatment of angle closure for emergency use if the optometrist (A) consults and collaborates with an ophthalmologist in accordance with the by-laws, and (B) makes an immediate referral to an ophthalmologist

The drugs may be used alone or in combination with other drugs.

Thank you to the Regulatory Advisory Committee members:

Dr. Dale Mulhall, *Chair*

Dr. Gary Butterworth

Dr. Michael Nelson

Dr. Neil Campbell, *President of the Manitoba Association of Optometrists*

For more information about the TPA legislation in Manitoba, visit:

optometrists.mb.ca/

Fluoroquinolones administrées par voie orale et décollement de la rétine

Points clés

- Dans une étude pharmacoépidémiologique, la prise actuelle de fluoroquinolones par voie orale était associée à un risque accru de décollement de la rétine.
- Santé Canada a reçu une déclaration de cas de décollement de la rétine soupçonné d'être associé à la prise d'une fluoroquinolone par voie orale.
- Les professionnels de la santé sont encouragés à déclarer à Santé Canada tout effet indésirable soupçonné d'être associé à la prise de fluoroquinolones par voie orale et qui concerne un décollement de la rétine.

Les fluoroquinolones administrées par voie orale sont des antibiotiques à large spectre indiqués dans le traitement d'infections causées par des souches sensibles de microorganismes¹⁻⁵. Au Canada, il existe cinq fluoroquinolones prises par voie orale sur le marché : la ciprofloxacine (mise sur le marché en 1996), la lévofloxacine (1997), la moxifloxacine (2000), la norfloxacine (1986) et l'ofloxacine (1990). Aucune monographie de produit canadienne des fluoroquinolones administrées par voie orale ne fait état d'un risque de décollement de la rétine parmi les effets indésirables de ces produits.

Le décollement de la rétine est caractérisé par la séparation de la rétine du tissu sous-jacent dans l'œil⁶. Parmi les différents types possibles de décollement de la rétine, le décollement rhégmato-gène est le plus courant. Il résulte de fissures de la rétine causées par une traction vitréo-rétinienne. Les facteurs de risque fréquemment associés au décollement de la rétine sont le vieillissement, une chirurgie antérieure de la cataracte, la myopie et un trauma. Les patients ont généralement des symptômes tels que des éclairs lumineux, des corps flottants, une perte de vision périphérique et une vision brouillée. Le décollement de la rétine est une urgence

médicale sérieuse qui nécessite habituellement une intervention chirurgicale rapide^{6,7}.

Dans une étude pharmacoépidémiologique, la prise actuelle de fluoroquinolones par voie orale était associée à un risque accru de décollement de la rétine⁸. Les fluoroquinolones pour usage ophtalmique ont été exclues de l'étude pour éviter un biais de causalité inversée. L'étude a permis de recenser 445 cas de décollement de la rétine associé à la prise d'une fluoroquinolone par voie orale dans une cohorte de 989 591 patients de la Colombie-Britannique qui avaient consulté un ophtalmologiste entre janvier 2000 et décembre 2007. D'autres recherches seront nécessaires pour déterminer une association possible entre le décollement de la rétine et les fluoroquinolones et pour élucider le mécanisme d'action.

En date du 31 décembre 2012, Santé Canada avait reçu une déclaration d'incident concernant un décollement de la rétine soupçonné d'être associé à la prise d'une fluoroquinolone par voie orale. Le cas signalé est celui d'une femme de 52 ans qui a subi un décollement de la rétine après un cycle de ciprofloxacine prescrit contre une infection de la vessie. Peu de preuves établissant un lien entre le décol-

lement de la rétine et les fluoroquinolones prises par voie orale pourraient expliquer la faible déclaration des cas à Santé Canada.

Les professionnels de la santé sont encouragés à déclarer à Santé Canada tout effet indésirable (EI) soupçonné d'être associé à des fluoroquinolones par voie orale et qui concerne un décollement de la rétine. Au moment de déclarer de tels EI, il est important d'inclure des renseignements tels que la durée du traitement, la posologie, l'exposition actuelle ou antérieure à des fluoroquinolones par voie orale ainsi que les symptômes reliés au décollement de la rétine tels que les éclairs lumineux, les corps flottants et la perte de vision périphérique. Ces renseignements peuvent permettre une évaluation plus approfondie des déclarations d'EI qui concernent le décollement de la rétine soupçonné d'être associé à l'usage de fluoroquinolones par voie orale.

— Alain Beliveau, PhD, Santé Canada

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Source : **Beliveau A. Fluoroquinolones administrées par voie orale et décollement de la rétine. Bulletin canadien des effets indésirables 2013;23(3):1-2.**

La dixième journée scientifique de l'École d'optométrie

Œil, cerveau et vision



Lors de sa conférence, le professeur Robert Hess a livré à l'auditoire les résultats de ses recherches sur l'amblyopie.

BY CLAUDE J GIASSON O.D., PH.D.

La dixième journée scientifique de l'École d'optométrie de l'Université de Montréal, organisée conjointement avec le Groupe de Recherche en Sciences de la Vision (GRSV), s'est tenue le 22 mars dernier sous la grande tour du pavillon Roger-Gaudry, qui fête cette année son 70^e anniversaire sur la montagne. En plus des conférenciers étudiants et chercheurs

post-doctoraux oeuvrant dans les laboratoires de l'École et/ou du GRSV, l'auditoire a pu écouter les présentations des conférenciers invités, les professeurs Marc Hébert, Robert Hess et Langis Michaud.

Le professeur Robert F. Hess dirige le laboratoire de recherche en Vision, du département d'ophtalmologie, de la Faculté de médecine de l'Université McGill. Diplômé en optométrie de l'Institut de technologie du Queensland en

SOMMAIRE

Le 22 mars dernier, s'est déroulée à l'Université de Montréal, la 10^e journée scientifique de l'École d'optométrie et du Groupe de recherche en Sciences de la Vision.

Le conférencier principal, le professeur Robert Hess a contesté la prémisse habituelle que l'amblyopie est avant tout un problème monoculaire. Aussi, plutôt que d'occlure le bon œil, il a proposé de traiter binoculairement cette condition en réduisant le contraste de l'image de l'œil fixateur. La vision binoculaire et l'acuité visuelle de l'œil amblyope se sont améliorées chez la plupart des sujets ainsi traités.

Le professeur Marc Hébert, électrophysiologiste de l'Université Laval, a rapporté la découverte d'altérations dans l'électrorétinogramme de certains patients atteints de troubles psychiatriques héréditaires.

La maladie de Fabry a fait l'objet de la conférence de Langis Michaud, professeur à l'École d'optométrie de l'Université de Montréal. Comme cette rare maladie de surcharge lysosomale produit des signes oculaires, la participation des optométristes canadiens dans l'étude a permis d'identifier 26 patients supplémentaires. Langis Michaud a décrit un signe supplémentaire, mais inédit, la tortuosité vasculaire de la paupière supérieure. Il l'a observé chez la plupart des 38 patients dont il assure le suivi.

La 10^e journée scientifique a également été l'occasion d'écouter les présentations des étudiants, tant diplômés qu'inscrits au premier cycle et d'en souligner l'excellence.

ABSTRACT

The 10th Science Day of the École d'optométrie and the Research Group of Vision Science was held at the Université de Montréal on March 22nd.

The Keynote speaker, Professor Robert Hess challenged the current premise that amblyopia is primarily a monocular problem. Instead of conventional eye patching of the good eye, this condition can be treated dichoptically with a reduction of the contrast of the image seen with the fixating eye. He provided evidence that amblyopic patients, trained in such a way, have improved binocular vision as well as improved vision of the amblyopic eye.

Professor Marc Hebert, an electrophysiologist from Laval University, discussed alterations of specific waves in the electroretinogram of some patients with inherited psychiatric disorders.

Professor Langis Michaud from the École d'optométrie, Université de Montréal discussed Fabry's disease, a lysosomal storage disease with ocular signs. The involvement of Canadian optometrists in the study allowed the identification of 26 supplementary patients. Dr. Michaud discussed an additional sign, vascular tortuosity of superior lid, that he observed in most of the 38 patients with Fabry's disease that he has followed.

The 10th science day was also the opportunity to listen to students' presentations both at the graduate and undergraduate levels and to emphasize their excellence.

1970, le professeur Hess a complété une maîtrise en sciences en neuro-psychologie à l'Université d'Aston au Royaume-Uni, puis un doctorat à l'Université de Melbourne. Il

poursuit ensuite des recherches à l'Université de Cambridge, où il est nommé maître de conférences au département de physiologie. Depuis 1990, le professeur Hess s'est établi à Montréal. Visionnaire, il établit et dirige des programmes de recherche multidisciplinaire utilisant une variété d'approches : psychophysique, neurophysiologique, d'imagerie optique ou cérébrale (IRMf, TMS). Le professeur Hess est l'auteur ou le co-auteur de près de 300 articles scientifiques dans de prestigieuses revues dont la diversité des titres témoigne de l'ampleur de la contribution dans plusieurs domaines associés à l'œil, au cerveau ou à la vision. En effet, ses travaux ont été publiés dans *Brain*, *British Journal of Ophthalmology*, *Cerebral Cortex*, *Current Biology*, *European Journal of Neuroscience*, *Experimental Brain Research*, *Human Brain Mapping*, *Investigative Ophthalmology & Visual Science*, *Journal of Neurophysiology*, *Journal of the Optical Society of America*, *Journal of Physiology*, *Journal of Vision*, *Nature*, *Neuroimage*, *Ophthalmic & Physiological Optics*, *Optometry & Vision Science*, *Strabismus*, *Vision Research*. Il a siégé sur de nombreux comités de recherche au Royaume-Uni, au Canada, et sur les comités de rédaction de plusieurs revues scientifiques de premier plan. Il a reçu de nombreux honneurs pour sa contribution exceptionnelle à la compréhension des mécanismes de la vision. Le professeur Robert Hess est l'un des leaders en recherche sur la vision, reconnu pour son originalité et son influence sur la compréhension du traitement visuel. Son laboratoire étudie non seulement le traitement du mouvement,

de la forme, de la profondeur et de la couleur dans la scène visuelle, mais aussi l'amblyopie.

La condition de l'amblyope souligne l'importance de l'expérience visuelle en début de vie pour le développement normal de la fonction visuelle de même que les conséquences de la perturbation de la fonction visuelle de l'enfant. Dans sa présentation, « A fresh think about treating amblyopia », le professeur Hess a remis en question l'usage de l'occlusion dans le traitement de l'amblyopie, soulignant qu'occlure l'œil fixateur n'aide en rien le développement d'une vision binoculaire normale. Selon lui, l'anomalie primaire de l'amblyopie du strabique ou de l'anisométrope est d'abord la perte de la fonction binoculaire, entraînant la perte de la vision monoculaire. Dans ce contexte, la fonction binoculaire doit d'abord être rétablie, ce qui permettra de réduire l'amblyopie par la suite. Afin de contrer la suppression de l'œil amblyope lors d'une tâche dichoptique, méthode démontrée efficace par ses précédents travaux de recherche, le contraste de l'image vue par l'œil fixateur doit être réduit par rapport à celui que perçoit l'œil amblyope. Une observation prolongée dans ces conditions artificielles renforce la vision binoculaire des amblyopes avec strabisme au point que plusieurs d'entre eux deviennent capables de combiner des signaux interoculaires de contraste égal. Une fois ces conclusions obtenues en conditions psychophysiques contrôlées au laboratoire, relate-t-il, son groupe s'est ensuite employé à les utiliser

hors du laboratoire pour traiter des sujets amblyopes. À cet effet, un jeu vidéo Tetris, présenté de façon bi-oculaire sur l'écran d'un appareil iPod, a été mis au point par l'équipe en réduisant le contraste présenté à l'œil fixateur. Le jeu ne peut être réussi seulement si l'information des deux yeux est fusionnée, ce qui réduit la suppression de l'œil amblyope. Avec l'entraînement, le contraste des éléments vus par l'œil fixateur peut être augmenté afin de réduire et éliminer le décalage. Ce traitement simple, adapté à ce dispositif minuscule et portable, a pu dans bien des cas améliorer la stéréoscopie et réduire le degré d'amblyopie monoculaire. Ceci a même été observé chez des adultes, chez qui un traitement par occlusion n'est habituellement pas entrepris. Bref, la présentation du Dr Hess a démontré non seulement les bases fondamentales justifiant la nécessité de reconsidérer l'origine de l'amblyopie, mais a décrit un dispositif technologique que des sujets amblyopes peuvent utiliser dans un traitement sans étape monoculaire.

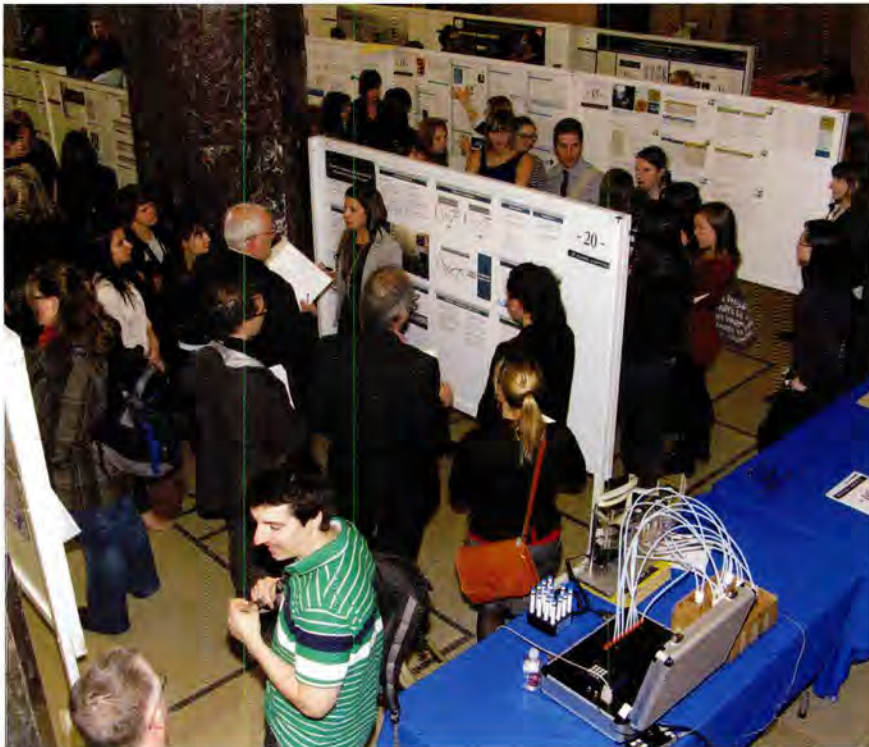
Après la pause-repas consacrée au lancement de l'édition 2013 du répertoire « Les lentilles cornéennes et solutions, les agents diagnostiques et thérapeutiques oculaires », le Dr Marc Hébert a présenté sa conférence, « Découverte de biomarqueurs rétiniens dans les maladies psychiatriques tels que mesurés avec l'électrorétinogramme ». Le Dr Marc Hébert est professeur titulaire au département d'ophtalmologie et oto-rhino-laryngologie-chirurgie cervico-faciale de l'Université Laval



Le professeur Marc Hébert a discuté des changements dans l'ERG de certains patients atteints de maladies psychiatriques héréditaires.

et chercheur au Centre de recherche de l'Institut universitaire en santé mentale de Québec. Après des études en psychologie à l'Université d'Ottawa, il fait une maîtrise et un doctorat en sciences neurologiques à l'Université de Montréal avant de poursuivre un premier post-doctorat au *Rush Presbyterian St. Lukes Medical School* de Chicago, puis un second à l'Université de l'Alberta à Edmonton. Son Laboratoire d'électrophysiologie visuelle et de photobiologie (LEVP) constitue l'un des laboratoires canadiens les mieux équipés en électrophysiologie visuelle avec sept plateformes d'électrorétinographie destinées à la recherche humaine et animale. Il est présentement aussi directeur de l'axe des neurosciences cliniques et cognitives de l'Institut Universitaire en Santé Mentale de

Québec (IUSMQ) et co-directeur du Centre Thématique de Recherche en Neurosciences (CTRN). Les recherches du Dr Hébert sont diversifiées mais la rétine y joue toujours un rôle central. Ses travaux de recherche effectués sur le travail de nuit ou sur le trouble affectif saisonnier (TAS) utilisent et étudient l'effet de la lumière tant au niveau de la rétine que du cerveau. De plus, son laboratoire s'intéresse aux réactions de la rétine dans diverses maladies psychiatriques (schizophrénie, trouble bipolaire, dépression majeure). Dans sa conférence, il a présenté des évidences à l'effet que certaines formes héréditaires de ces maladies peuvent parfois produire des modifications du tracé de l'électrorétinogramme. N'est-il pas surprenant que, dans ces cas, le fonctionnement de la rétine, cette extension du cerveau, puisse



Présentation des affiches dans le ball d'honneur de l'Université de Montréal

refléter une neurochimie centrale altérée?

La dernière conférence, celle du Dr Langis Michaud de l'École d'optométrie, portait sur la maladie de Fabry. Cette rare affection, liée au chromosome X, est mortelle pour l'humain mâle avant l'âge de 60 ans à moins qu'un diagnostic précoce ne prévienne les changements irréversibles au cœur et aux reins. Attribuable à un déficit génétique de l'enzyme lysosomale, l'alpha-galactosidase, des produits du métabolisme non dégradés s'accumulent dans les lysosomes des cellules des parois vasculaires et autres, causant les dommages. Les manifestations oculaires hâtives et courantes sont les suivantes: «verticillata» cornéen, cataracte

de la capsule postérieure, tortuosité des vaisseaux rétinien ou conjonctivaux. L'implication des optométristes canadiens, invités il y a 3 ans à dépister les patients atteints de cette maladie, a permis d'identifier 26 patients supplémentaires. Ces personnes, prises en charge par des médecins, reçoivent, lorsqu'approprié, l'enzyme recombinante en perfusion, ce qui limite les dégâts. Le professeur Michaud suit l'évolution longitudinale des manifestations oculaires de la maladie de Fabry de 38 patients dont il assure le suivi. Les examens cliniques ont conduit à l'observation, chez plus de 90 % d'entre eux, d'un nouveau signe affectant les patients de Fabry: les tortuosités vasculaires de la paupière supérieure.

Les 7 autres conférences et 29 affiches au programme de la journée ont été présentées par des étudiants diplômés, post-doctoraux ou de premier cycle en optométrie. 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 diplômé ou par un étudiant de premier cycle en optométrie.

Cet événement a été rendu possible grâce à la contribution de la société Allergan et du Groupe de Recherche en Sciences de la Vision (GRSV). La générosité de ces commanditaires a permis également de distribuer cinq prix d'excellence de 500 \$ chacun à huit étudiants. Katerine Deschênes et Phuong-Trang Mach, étudiantes de 4^e année en optométrie ont été choisies par l'auditoire comme les récipiendaires du prix du public pour leur présentation intitulée: « Effets de l'utilisation en préopératoire de bouchons lacrymaux temporaires sur la sécheresse oculaire secondaire au LASIK ». Ces étudiantes étaient dirigées par la Dre Nadia Marie Quesnel. Les autres gagnants ont été sélectionnés par quatre différents jurys de professeurs et de chercheurs. Marianne Groleau, des laboratoires des professeurs Christian Casanova et Elvire Vaucher, s'est méritée le prix du GRSV attribué pour la meilleure conférence d'une étudiante diplômée. Sa présentation s'intitulait: « Conséquences de la délétion des récepteurs muscariniques sur l'organisation du cortex visuel primaire de la souris ». Le prix du GRSV, attribué à la meilleure présentation par affiche à un

étudiant diplômé a été décerné à Ankush Madaan, étudiant du Dr Sylvain Chemtob, pour sa présentation: « Regulation of retinal angiogenesis by a novel lactate receptor, GPR81 ». Stéphanie Marcotte et Marie-Christelle Moreau de même que Stéphanie Laflamme et Joanie Levasseur ont reçu les prix remis par la société Allergan

pour les meilleures communications par affiche scientifique et clinique d'étudiants en optométrie. Leurs travaux qui avaient été dirigés par les Drs Julie Brûlé et Langis Michaud avaient pour titre: « Tabagisme et santé oculaire : connaissances des ados québécois » et « Étude de la variation d'épaisseur de la couche lacrymale sous une lentille de

grand diamètre avec la technique de tomographie par cohérence optique ». Ces prix remis, la journée scientifique s'est terminée en se désaltérant ensemble tout en se disant satisfaits d'avoir de si bons étudiants.

TABEAU 1 : Communications orales réalisées par des étudiants diplômés ou post-doctoraux

Titre de la présentation	Étudiant
Centuries of functional electrical stimulation (FES) – lessons learned toward efficient brain micro-stimulation	NI Krouchev
Effet de la privation visuelle précoce sur la composition des récepteurs AMPA et NMDA des cortex sensoriels de la souris	J Cloutier-Beaupré
Conséquences de la délétion des récepteurs muscariniques sur l'organisation du cortex visuel primaire de la souris	M Groleau
Le vieillissement normal et la perception du mouvement	R Allard
L'analyse temps-fréquence de l'électrorétinogramme (ERG) permet la détection précoce d'une anomalie rétinienne	M Gauvin
Imagerie rétinienne fonctionnelle : caractéristiques et origine de la réponse intrinsèque	A Naderian
Network-selectivity and stimulus discrimination between primary visual neurons : dynamics of connectome	V Bharmuria

TABEAU 2 : Affiches réalisées par des étudiants diplômés

Titre de la présentation	Étudiant
Expression rétinienne des enzymes endocannabinoïdes diacylglycérol lipase α (DAGL α) et monoacylglycérol lipase (MGL) lors du développement du rat	B Cécyre
Are Age and Duration of Vision Impairment Factors in the Ability to Cope with Low Vision ?	P Krivobarska
Les cellules de Müller expriment le récepteur endocannabinoïde CB2 dans la rétine du singe vervet	J Bouskila
La fonction de l'ajustement et le calcul sur l'oxygénation sanguine par la réflectométrie multicanaux	V Vucea
Localization of cannabinoid receptors 1 and 2 in retinogeniculostriate pathway of vervet monkey	J Pasha
Regulation of retinal angiogenesis by a novel lactate receptor, GPR81	A Madaan
Le rôle du récepteur GPR55 dans la croissance et le guidage axonal des cellules ganglionnaires de la rétine au cours du développement.	H Cherif
The Influence of Fixation Stability on Balance in Patients with a Central Scotoma	C Murphy
Étude des propriétés anatomo-fonctionnelles de l'aire visuelle V1 des souris D1R et D2R KO	BOF de Souza

- Engagement continu envers les normes élevées de qualité des soins
- Approche fondée sur des preuves
- Relations collégiales
- Communication efficace, claire et en temps opportun
- Utilisation optimale des compétences des professionnels et des ressources limitées
- Dédoublement des examens et des services gardé au minimum

Règlements et recommandations

Les recommandations sont présentées dans le contexte de la réglementation de l'optométrie en vigueur en Ontario. Il s'agit de recommandations seulement, qu'il faut adapter aux circonstances particulières de la manifestation clinique, à la disponibilité des professionnels des soins oculovisuels et aux ressources.

L'examen typique d'un patient qui a le glaucome ou chez lequel on soupçonne un glaucome inclurait une gonioscopie, la détermination de la pression intraoculaire (PIO), l'épaisseur de la cornée centrale, les champs de vision seuils, l'évaluation du nerf optique et de la couche de fibres nerveuses, et la documentation pertinente. La tonométrie par applanation de Goldmann constitue la « norme » en vigueur de mesure de la PIO.

Le tableau qui suit définit les stades du glaucome.

Cas soupçonnés de glaucome

Règlement sur l'optométrie : Le règlement ne traite pas des patients considérés comme un cas soupçonné de glaucome.

DÉTERMINATION DU STADE DES CAS SOUPÇONNÉS DE GLAUCOME ET DES PATIENTS QUI ONT LE GLAUCOME

Cas soupçonné	1 ou 2 des suivants : ■ PIO > 21 mm Hg ■ papille suspecte ou asymétrie douteuse de la cupule/papille (C/P) > 0,2 ■ déficit soupçonné du CV 2-42 (ou semblable)
Glaucome au stade précoce	Caractéristiques du glaucome au stade précoce de la papille (p. ex., C/P < 0,65) ou léger déficit du CV ne se situant pas au-delà de 10 degrés de fixation (p. ex., DM dépassant -6 dB selon HVF 24-2)
Glaucome modéré	Caractéristiques du glaucome modéré de la papille (p. ex., C/P 0,7-0,85) ou déficience modérée du CV au-delà de 10 degrés de fixation (p. ex., DM de -6 à -12 dB selon HVF 24-2)
Glaucome avancé	Caractéristiques de glaucome avancé de la papille (p. ex., C/P* > 0,9) ou déficit du CV en deçà de 10 degrés de fixation** (p. ex., DM pire que -12 dB selon HVF 24-2)

HVF=Analyseur du champ visuel Humphrey; DM=dérivation moyenne

* Désigne le rapport C/P vertical d'un nerf de taille moyenne. Si le nerf est petit, le rapport C/P peut quand même être significatif. Par contre, un nerf plus gros peut avoir un rapport C/P vertical plus grand qui se situe quand même dans la limite normale.

** Il faut aussi tenir compte du niveau de référence 10-2 du CV (ou semblable)

Source : Adapté du Guide factuel de pratique clinique de la Société canadienne d'ophtalmologie pour la gestion du glaucome chez les adultes (*J Can Ophthalmol.* 2009; 44 (supp. 1):S55S100.

Cas soupçonnés de glaucome à faible risque

Un optométriste ou un ophtalmologiste peut gérer les cas soupçonnés de glaucome à faible risque. Ces cas présentent une des caractéristiques suivantes :

- PIO > 21 mm Hg
- papille suspecte ou asymétrie cupule/papille (C/P) de > 0,2
- déficit suspect du CV 24-2 (ou semblable)

(*J Can Ophthalmol.* 2009; 44 (supp. 1):S55S100)

Compte tenu de ces paramètres normaux, le niveau de soupçon est toutefois assez faible pour que le professionnel de la santé détermine qu'il est peu probable que le patient ait le glaucome.

Les cas soupçonnés de glaucome à faible risque peuvent inclure les suivants :

- Jeunes patients adultes qui ont des antécédents familiaux mais ne

présentent aucun signe oculaire significatif

- Hypertension oculaire présentant des pressions variant de la basse vingtaine à la vingtaine moyenne, mais aucun autre signe oculaire significatif
 - Patients qui ont une papille anormale ou suspecte, mais aucun autre signe oculaire significatif
- Après l'évaluation initiale et l'établissement des données cliniques de référence, la fréquence des examens de suivi est laissée à la discrétion du professionnel des soins oculovisuels traitant, même si l'on suggère de suivre le patient au moins aux deux ans. Au cours de chaque visite de suivi, il faut évaluer la stabilité (c.-à-d. la PIO, la papille optique et le champ de vision sont-ils stables?). Lorsque l'on soupçonne un changement au niveau de la papille optique ou du champ de vision, il faut procéder à

un examen de confirmation. Si le changement est confirmé, il faut alors traiter le patient comme une personne qui a le glaucome au stade précoce.

Cas soupçonnés de glaucome à risque élevé

Un optométriste ou un ophtalmologiste peut traiter des cas soupçonnés de glaucome à risque élevé, qu'il faut évaluer au moins une fois par année. Les cas soupçonnés de glaucome à risque élevé présentent un ou plusieurs des signes suivants, mais la déviation par rapport à la normale est beaucoup plus prononcée que dans les cas soupçonnés à faible risque :

- PIO > 21 mm Hg
- papille suspecte ou asymétrie cupule/papille (C/P) de > 0,2
- déficit suspect du CV 24-2 (ou semblable) (*J Can Ophtalmol.* 2009; 44 (supp. 1):S55S100)

Les cas soupçonnés de glaucome à risque élevé peuvent inclure les éléments suivants :

- PIO dans la vingtaine élevée et antécédents familiaux primaires positifs de glaucome, mais aucune autre constatation oculaire significative
- Excavation douteuse, minceur de la cornée centrale, PIO dans la basse vingtaine, mais aucun autre signe oculaire significatif

Dans un cas soupçonné de glaucome à risque élevé, des évaluations ou des examens plus fréquents s'imposent après l'établissement des données cliniques de référence. Il faut informer les patients de leurs facteurs de risque de glaucome et discuter avec eux de la justification d'une thérapie visant à réduire la pression intraoculaire.

Patients qui ont le glaucome primaire à angle ouvert

Règlement sur l'optométrie :

Les optométristes « ... peuvent traiter seulement les patients qui ont le glaucome primaire à angle ouvert dont le traitement n'est pas compliqué par un problème médical simultané ou une pharmacothérapie qui pourrait réagir avec le traitement. »

En outre, « Conformément à la norme d'exercice de la profession, un membre peut traiter seulement un patient qui a le glaucome à angle ouvert dont le traitement est compliqué par un problème médical simultané ou une pharmacothérapie qui pourrait réagir avec le traitement, en collaboration avec un médecin avec qui le membre a établi un modèle de cogestion des soins pour le patient en cause et qui est :

- a) certifié par le Collège royal des médecins et chirurgiens du Canada comme spécialisé en ophtalmologie; ou*
- b) reconnu officiellement par écrit par le Collège des médecins et chirurgiens de l'Ontario comme spécialisé en ophtalmologie. » (Traduction)*

Patients qui ont le GPAO au stade précoce

Un optométriste ou un ophtalmologiste peut diagnostiquer un GPAO au stade précoce et prendre en charge les patients en cause. Il faut établir des données de référence avec minutie. Les examens de suivi doivent avoir lieu au moins aux six mois pendant les 18 mois suivants afin de commencer à déterminer l'évolution du glaucome. En général, les patients stables devraient se soumettre à une évaluation de la PIO au moins aux six mois et à une évaluation du champ de vision et du disque du nerf optique au moins une fois par année. Tout dépend de la manifestation clinique.

Patients qui ont le GPAO modéré

Un optométriste ou un ophtalmologiste peut diagnostiquer un GPAO modéré et prendre en charge les patients en cause. On encourage toutefois les optométristes à référer sur-le-champ le patient à un ophtalmologiste si l'état du patient les préoccupe toujours. Ils peuvent aussi envisager d'entreprendre un traitement et de référer le patient dans un délai raisonnable (par exemple, six mois) pour qu'on envisage la prise en charge partagée à l'avenir. Après l'établissement de données de référence solides, les patients dont les manifestations cliniques sont stables devraient se soumettre à une évaluation de la PIO au moins aux six mois et à une évaluation du champ de vision et du disque du nerf optique au moins une fois par année : tout dépend des manifestations cliniques. Si le GPAO modéré d'un patient pris en charge par un optométriste évolue en dépit d'un traitement médical optimal, il faut référer le patient à un ophtalmologiste.

Patients qui ont le GPAO au stade avancé

Les patients qui ont le GPAO au stade avancé présentent un risque important de cécité et doivent être traités par le professionnel des soins oculovisuels le plus chevronné disponible. Comme une intervention chirurgicale s'impose souvent, un ophtalmologiste qui connaît le traitement chirurgical de la maladie devrait être chargé du soin de ces patients. Si toutes les possibilités de traitement sont épuisées, il peut être plus approprié de suivre un œil au stade ultime en prise en charge partagée.

Il faut déterminer la PIO et évaluer les champs de vision et le nerf optique au moins aux trois à six mois jusqu'à ce que l'état du patient soit jugé stable. Les patients qui ont une maladie grave présentent un risque élevé de déficience visuelle et de cécité et il faut en général les traiter de façon plus agressive et les suivre plus souvent que ceux qui ont la maladie au stade plus précoce.

La prise en charge clinique de ces patients doit viser avant tout à assurer la stabilité de la PIO, du champ de vision et du nerf optique, l'observation du traitement et la tolérance des médicaments.

Évolution du glaucome

La clé de la prise en charge consiste à détecter l'évolution du glaucome et, idéalement, à la prévenir.

Les scénarios cliniques qui suivent portent sur des patients dont le glaucome est instable et sont tirés des lignes directrices :

- i. **Critère lié à la PIO :** Un patient qui suit un traitement contre le glaucome n'atteint pas la PIO visée en dépit des changements apportés au traitement médical.
- ii. **Critère lié au champ de vision :** Un patient qui suit un traitement contre le glaucome présente un changement reproductible, cliniquement significatif et plus important que prévu du champ de vision, en dépit des changements apportés à la PIO cible et au traitement médical.
- iii. **Critère lié au nerf optique :** Un patient qui suit un traitement contre le glaucome présente un changement reproductible, cliniquement significatif et plus important que prévu de l'apparence de la CFNR (couche des fibres nerveuses de la rétine) ou du nerf optique (par exemple,

hémorragie de la papille), en dépit des changements apportés à la PIO cible et au traitement médical.

Dans ses lignes directrices sur le glaucome, la SCO recommande de chercher à établir un lien entre les changements structurels et fonctionnels en cas d'évolution soupçonnée, même s'il est plus courant de repérer un changement dans un cas ou dans l'autre indépendamment. Il faut toujours penser à la variabilité des résultats d'examen sur le plan des évaluations tant structurelles que fonctionnelles, de même qu'à l'existence de résultats faussement positifs et faussement négatifs.

Prise en charge partagée

En vertu du **Règlement sur l'optométrie**, un optométriste doit partager avec un ophtalmologiste la prise en charge des cas suivants :

- a) GPAO compliqué par un problème médical simultané, ou
- b) GPAO compliqué par une pharmacothérapie qui peut réagir avec le traitement.

Il faut alors établir une communication claire et documentée qui décrit les attentes relatives à la prise en charge de la maladie, la fréquence des consultations de chaque professionnel des soins oculovisuels et les critères de l'aiguillage rapide. Il est important que le patient comprenne quel clinicien est son principal point de contact. Il s'agira normalement de l'optométriste, sauf s'il y a entente entre l'optométriste et l'ophtalmologiste et si elle est communiquée au patient. Il faut réduire le plus possible la répétition des examens.

Les problèmes médicaux ou oculovisuels simultanés dignes de mention peuvent inclure les suivants, notamment :

- S'il faut envisager un bêta-bloquant : ces agents peuvent être contre-indiqués en cas d'antécédents d'insuffisance cardiaque globale, de bradycardie, de bloc cardiaque, d'asthme, de maladie pulmonaire obstructive chronique ou de diabète mal contrôlé.
- S'il faut envisager une prostaglandine : ces agents peuvent être contre-indiqués en cas de maladie inflammatoire intraoculaire ou d'œdème maculaire kystoïde (OMK).
- S'il faut envisager un cholinergique : ces agents peuvent être contre-indiqués en cas de maladie inflammatoire intraoculaire, de dégénérescence rétinienne palissadique, de déchirement ou de décollement de la rétine.

Les pharmacothérapies qui pourraient réagir avec le traitement et sont dignes de mention peuvent inclure les suivantes :

- S'il faut envisager un cholinergique : ces agents peuvent réagir avec les inhibiteurs de la MAO.

Nota : les points ci-dessus ne constituent nullement une liste complète.

Recommandations relatives à la prise en charge partagée :

- L'optométriste et l'ophtalmologiste doivent s'échanger les résultats de tous les tests.
 - *L'information échangée pourrait être aussi simple que la suivante : champs stables, aucun changement de la CFNR ou du DNO, PIO 14/15*
- L'optométriste et l'ophtalmologiste doivent s'échanger tous les changements de la prise en charge.

- Cette information pourrait inclure des changements du traitement, de la fréquence des visites et de celle des tests.

- L'optométriste et l'ophtalmologiste doivent s'échanger tous les changements des conseils donnés au patient.

- Cette information pourrait inclure le calendrier de prise des médicaments et l'utilisation de l'occlusion du point lacrymal.

- L'optométriste et l'ophtalmologiste doivent communiquer au sujet de tout changement de l'état de la maladie ou des complications.

- Cette information pourrait porter notamment sur l'évolution de la maladie, les réactions allergiques, les effets secondaires importants et l'apparition de maladies simultanées qui peuvent compliquer les résultats d'examen (p. ex., DMLA, cataracte)

Glaucome secondaire

Règlement sur l'optométrie :

« Il est pratique courante dans la profession qu'un membre (optométriste) réfère à un médecin ou à un hôpital un patient qui a un glaucome autre que le glaucome primaire à angle ouvert ». (Traduction)

Recommandation :

Dans de telles circonstances, après la rencontre initiale, l'ophtalmologiste et l'optométriste devraient communiquer au sujet du diagnostic et de la prise en charge continue du patient. L'ophtalmologiste peut se charger du patient, peut recommander une prise en charge partagée active ou peut offrir d'accueillir le patient au besoin (comme consultant) en précisant que l'optométriste continue de fournir les soins primaires.

Par exemple, un patient qui se présente avec un syndrome de dispersion pigmentaire, des excavations suspectes et un rapport C/P de 0,7, un défaut du ressaut nasal reproductible et des PIO de 25 mm Hg. L'optométriste diagnostique le glaucome secondaire et réfère le patient à un ophtalmologiste. Le diagnostic est confirmé et une stratégie de prise en charge est élaborée. L'ophtalmologiste peut alors décider de continuer de s'occuper du patient, recommander un plan de soin partagé ou renvoyer le patient chez l'optométriste qui assurera la continuité des soins lorsque l'ophtalmologiste demeure disponible au besoin. Dans un deuxième temps, l'optométriste peut appeler l'ophtalmologiste et les deux peuvent s'entendre sur une première démarche thérapeutique jusqu'à ce que l'ophtalmologiste ait pu examiner le patient.

Glaucome à angle fermé

Règlement sur l'optométrie :

« (1) Sous réserve des paragraphes (2) et (3), il est pratique courante dans la profession qu'un membre (optométriste) renvoie à un médecin ou à un hôpital un patient qui a un glaucome autre qu'un glaucome primaire à angle ouvert.

(2) Il est pratique courante dans la profession qu'un membre peut commencer à traiter un patient qui a un glaucome à angle fermé seulement en cas d'urgence et lorsqu'aucun médecin n'est disponible pour le faire.

(3) Il est pratique courante dans la profession qu'un membre réfère à un médecin ou à un hôpital tout patient traité conformément au paragraphe (2) une fois que l'urgence n'existe plus ou qu'un médecin devient disponible, selon la première éventualité.

(4) Dans cet article, « hôpital » s'entend d'un hôpital au sens de la Loi sur les hôpitaux publics ». (Traduction)

Recommandation :

- Cas soupçonnés de glaucome à angle fermé et de glaucome à angles étroits¹ : Un optométriste peut contrôler les angles étroits chez les patients qui risquent d'avoir éventuellement un angle fermé ou le glaucome à angle fermé. L'optométriste doit référer le patient à un ophtalmologiste qui envisagera des iridotomies prophylactiques s'il y a risque que l'angle devienne occlus.
- Angle fermé primaire : L'optométriste doit référer le patient à un ophtalmologiste.
- Glaucome primaire à angle fermé : L'optométriste doit référer le patient à un ophtalmologiste.
- Angle fermé aigu : Une crise de glaucome à angle fermé constitue une urgence en soins ophtalmologiques. Il faut référer rapidement le patient à un médecin ou à un hôpital. Lorsqu'il y

¹ Definitions provided in: Angle Closure and Angle Closure Glaucoma. WGA Consensus Series 3. Eds: R.N. Weinreb & D.S. Friedman. Kugler Publications, 2006

Narrow Angles: Open but can close under appropriate circumstances; unable to view posterior trabecular meshwork (270°); IOP not elevated.

Primary Angle Closure Suspect: Narrow angles, verified by gonioscopy; no peripheral anterior synechiae; IOP not elevated; no evidence of disease (disc or field).

Primary Angle Closure: Shallow anterior chamber angle in presence of iridotrabecular contact, verified by gonioscopy; peripheral anterior synechiae; elevated IOP; no evidence of disc or field damage.

Primary Angle Closure Glaucoma: Shallow anterior chamber angle in presence of iridotrabecular contact, verified by gonioscopy; peripheral anterior synechiae; elevated IOP; evidence of disc and/or field damage.

va du meilleur intérêt du patient, les optométristes doivent entreprendre un traitement d'urgence dans le contexte de leur pratique clinique en utilisant le traitement approprié.²

Pour qu'un optométriste et un ophtalmologiste partagent la prise en charge d'un patient qui a un angle fermé et le glaucome à angle fermé, à la suite du traitement par l'ophtalmologiste, il faut qu'il y ait communication claire et documentée décrivant les attentes à l'égard de la prise en charge de la maladie, de la fréquence des visites à chaque professionnel des soins oculovisuels et des critères de référence rapide. Il importe que le patient comprenne quel clinicien est son principal point de contact. Ce sera normalement l'optométriste, à moins que celui-ci

et l'ophtalmologiste s'entendent et en informent le patient. Il faut réduire au minimum la répétition des examens dans la mesure du possible.

Conclusions

Le panorama légal du traitement du glaucome en Ontario a changé considérablement avec l'élargissement récent du champ d'exercice des optométristes. Les optométristes peuvent prendre en charge seuls les cas soupçonnés de glaucome et les patients qui ont le glaucome primaire à angle ouvert. L'importance de la prise en charge partagée entre optométriste et ophtalmologiste augmentera en outre. Une stratégie axée sur le patient qui accorde une attention particulière à ses besoins, conjuguée à une communication fréquente et claire entre le patient

et le professionnel, et entre l'optométriste et l'ophtalmologiste, optimisera les résultats pour les patients.

Les présentes lignes directrices visent à proposer une façon pratique et axée sur les patients d'aborder la nouvelle réglementation de l'optométrie. Elles visent à maximiser l'accessibilité, la qualité et la sécurité des soins pour le patient dans le contexte des soins de santé en Ontario, à lui fournir des soins du glaucome à la fine pointe. Par ailleurs, les recommandations présentées dans ce document visent à réduire au minimum le double emploi et à utiliser judicieusement les ressources disponibles afin d'établir un modèle rentable de soin pour ces patients.

² Optometric Practice Reference. College of Optometrists of Ontario.

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* Les lignes directrices sur le glaucome ont été rédigées par les membres du sous-comité du CSOO

Identifying the needs for eye care education in Quebec, Canada

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Introduction

In the province of Québec (Canada) optometrists, opticians and ophthalmologists are the three stakeholders in eye care provision. Whereas optometrists complete eye examinations, diagnose and treat ocular pathologies with topical medications and remove superficial foreign bodies from the eye – opticians sell and adjust ophthalmic lenses according to a prescription

issued by either an optometrist or an ophthalmologist. Ophthalmologists are medical doctors who may refract, diagnose ocular pathologies and further offer medical or surgical treatment.¹ It is unknown whether the population is aware of the scope of practice of eye care professionals – knowledge that is essential to an efficient use of eye care resources in the province.

Furthermore, the provincial public healthcare scheme (“Régie de l’assurance maladie du Québec” or RAMQ) covers eye examinations for eligible patients. Coverage includes ophthalmologic examinations for all residents of the province,

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ABSTRACT

In Québec, optometrists, opticians and ophthalmologists are the stakeholders in eye care provision. The public healthcare scheme covers optometric examinations for patients under 18, over 64 and any patient with an ocular emergency. A population educated on common eye conditions is more likely to seek care and implement preventative measures. However, little is known of the population’s awareness of the scope of practice of eyecare professionals, examination coverage or common oculo-visual conditions.

Purpose: To determine the patients’ awareness of the recommended guidelines of optometric examinations, of the scope of practice of eyecare professionals and of common oculo-visual conditions.

Methods: A self-administered questionnaire was distributed to patients presenting for an eye examination at the University of Montreal optometry clinic.

Results: Of our respondents (N=222), 63% believe a child should undergo an eye examination before age 5 and 62% believe a routine exam should be performed every 2 years. Fifty-eight percent know exam fees are covered for patients

under 18, 49% for patients over 64 and 59% for ocular emergencies. Twenty-eight percent of respondents believe optometrists are the eye care provider to consult to treat a red eye, 39% to diagnose ocular pathologies and 12% to remove a foreign body. Sixty-five percent of our respondents can identify the symptoms of myopia, compared to 25% for hyperopia and 52% for presbyopia. Regarding common eye diseases, 22% of respondents correctly identified cataracts, 45% glaucoma and 28% age-related macular degeneration (ARMD). Eighty-four percent of respondents showed some knowledge of risk factors, symptoms and treatments of cataracts, 27% for glaucoma and 22% for ARMD.

Conclusion: Respondents seem well aware of the guidelines surrounding ocular examinations. There are unmet needs in patient education regarding the details of coverage, the role of optometrists as primary eye care practitioners and the symptoms, risk factors and treatments of several common and sight-threatening conditions.

Key words: Awareness, knowledge, eye disease, refractive error, optometric examination guidelines, patient education.

RÉSUMÉ

Au Québec, optométristes, opticiens et ophtalmologistes se partagent la responsabilité des soins oculo-visuels. La Régie de l'assurance maladie du Québec (RAMQ) prend en charge les examens visuels pour les patients de moins de 18 ans, de plus de 64 ans et les examens d'urgences oculaires. Une population bien informée au sujet des maladies oculo-visuelles est plus susceptible de consulter de manière préventive de même que de rechercher un traitement lorsqu'un problème se pose. Peu de données existent quant aux connaissances de la population sur le champ de pratique des différents intervenants, la couverture de la RAMQ et les conditions oculo-visuelles courantes.

Objectif : Déterminer les connaissances des patients quant aux recommandations entourant les examens de la vue, le champ de pratique des professionnels, de même que concernant les problèmes oculo-visuels courants.

Méthode : Un questionnaire auto-administré a été distribué aux patients se présentant pour un examen complet à la Clinique Universitaire de la Vision (Montréal, Canada).

Résultats : Soixante-trois pourcent des répondants (N=222) croient qu'un enfant devrait avoir un premier examen de la vue avant l'âge de 5 ans et 62 % croient qu'un examen de routine devrait être fait tous les 2 ans. Cinquante-huit pourcent savent que les examens sont couverts pour les patients de moins de

18 ans, 49 % pour les patients de plus de 64 ans et 59 % pour les urgences oculaires. Vingt-huit pourcent des répondants croient que l'optométriste est le professionnel à consulter pour un œil rouge, 39 % pour le diagnostic des pathologies oculaires et 12 % pour le retrait d'un corps étranger. Soixante-cinq pourcent des répondants peuvent identifier les symptômes de la myopie, comparativement à 25 % pour l'hypermétropie et 52 % pour la presbyopie. Pour ce qui est des pathologies oculaires communes, 22 % des répondants ont correctement identifié les cataractes, 45 % le glaucome et 28 % la dégénérescence maculaire liée à l'âge (DMLA). Quatre-vingt quatre pourcent des répondants ont démontré certaines connaissances des facteurs de risques, des symptômes et du traitement des cataractes, 27 % pour le glaucome et 22 % pour la DMLA.

Conclusion : Les répondants semblent bien informés des modalités entourant un examen oculo-visuel. Il reste à mieux les informer de la couverture des services offerts par la RAMQ, de l'aptitude de l'optométriste à dépister et traiter certaines pathologies oculaires ainsi que des symptômes et des facteurs de risque de conditions oculo-visuelles pouvant être nuisibles à la vision.

Mots-clés : Connaissance, pathologie oculaire, erreur de réfraction, modalités des examens oculo-visuels, éducation du patient.

regardless of age² and optometric examinations for patients under 18, over 64 as well as for any patient presenting with an ocular emergency.^{2,3} Insured routine eye examinations lead to higher utilization of eye care services⁴ and may diminish the impact of eye diseases by encouraging people to seek preventative examinations that would eventually lead to early diagnosis of ocular diseases. It is thus of clinical importance that patients are made aware of such coverage eligibility criteria.

It is recommended that children have their first eye examination between the ages of 6 and 9 months, and at least one examination

between the ages of 2 and 5.⁵ Subsequent yearly examinations are recommended up to age 19, bi-yearly examinations for adults 20 to 64 years of age and yearly for adults 65 and over.⁵ With a readily available network of eye care services in the province, it would be expected most Québec residents are seeing their eye care provider regularly and, as such, are made aware of many common eye diseases through patient education. A 2009 provincial survey revealed 39% of Québec residents aged 12 or more had consulted an eye specialist (either optometrist or ophthalmologist) in the previous 12 months⁶ and very little is known on the

awareness and knowledge of common eye diseases in the Québec population. However, a study conducted in the province of British Columbia (Canada), which has a similar network and coverage as Québec⁷, reveals that although preventing vision loss is a top health priority for 28% of respondents, familiarity (having heard of) and understanding (having some knowledge of) of common eye diseases such as cataracts, glaucoma and age-related macular degeneration (ARMD) is low.⁸ A population that is educated on common eye diseases is more likely to seek care, implement preventative measures and comply with treatments.^{9, 10, 11, 12}

Objective

The purpose of this study is to determine the Québec population's awareness of the details pertaining to optometric examinations and their coverage by the RAMQ, the scope of practice of the different eye care professionals as well as their knowledge regarding definition, symptoms, risk factors, prevention and treatment of common refractive errors and eye diseases.

Methods

Between June and December 2012, a self-administered questionnaire was distributed to a convenience sample of all new patients aged 14 or more presenting for a complete eye examination at the university primary eye care clinic (Clinique Universitaire de la Vision, Université de Montréal, Montréal, Québec). Exclusion criteria included being under 14 years of age (which is in Québec the legal age at which an individual can seek medical care without parental consent), being an established patient of the clinic, being unable to fill out the questionnaire because of linguistic or other causes and being a student or practitioner in opticianry, optometry or ophthalmology. A questionnaire was considered valid if it was at least 90% completed by a first-time patient aged 14 or more.

The questionnaire was developed specifically for the needs of our study and included 30 close-ended, forced choice questions with "I don't know" and pertinent distractors as answer options. For example, distractors for refractive problems

included "difficulty distinguishing certain colours" and "difficulty seeing details at night". Divided into six sections, the questionnaire inquired about sociodemographics (age, sex, ethnicity, language used at home, education); knowledge of the guidelines for eye examinations (reason for consult, age at first consult, frequency of visits); knowledge of RAMQ coverage; knowledge of the scope of practice of opticians, optometrists, ophthalmologists; knowledge of risk factors, symptoms and treatment of common refractive problems (myopia, hyperopia, presbyopia); knowledge of risk factors, symptoms and treatment of common ocular conditions (cataracts, age-related macular degeneration (ARMD) and glaucoma). Non-technical (lay) terms were used when deemed necessary; for example, the correct definition for glaucoma in our questionnaire was "an elevated pressure inside the eye", which although not physiologically correct, is an association a person with some understanding of the disease is bound to have.

Informed consent was obtained from all participants and ethics approval was obtained from the Université de Montréal's institutional review board (Comité d'Éthique de la Recherche des Sciences de la Santé). Descriptive analyses were performed using PASW Statistics 17.0.

Results

Sample description

Two hundred and twenty two completed valid questionnaires were collected (57% women, 43% men;

mean age 43 years [SD 15 years]). Most respondents (59%) were university educated, 21% were college (CÉGEP) educated, 17% reported secondary school (high school) as the highest level of education completed and 2% had primary school education.

For 26% of our respondents, this was the first ever eye examination. Sixty percent of our respondents presented for a routine examination, while 25% presented with a complaint of blurry vision. Twenty-one percent presented to change glasses, 16% following a referral from their general practitioner, 7% because an eye problem was diagnosed in their family and 1% needed a form (such as a driver's license renewal form) filled out. None of our respondents presented for an eye examination following an ocular health awareness campaign.

Guidelines regarding eye examination and RAMQ coverage

Sixty-three percent of respondents believed that, in the absence of any symptoms, a child should undergo an eye examination before entering kindergarten (age 5), with only 10% believing a child should have an eye exam in the first year of life (*Table 1*). Symptoms that would prompt an eye examination for a child included frequent headaches at the end of the day (95%), an eye sometimes turning in or out (94%), reading problems (94%), squinting (90%), a teary eye (90%), sitting close to the television (89%), rubbing their eyes often (68%) and attention problems (48%).

Sixty two percent of respondents believed a routine eye examination

Table 1: Age at which a child should undergo a first eye exam (n=222)

	%
Before 1 year of age	10
Between 1 and 5 years of age (before kindergarten)	63
Before 12 years of age (before starting high school)	9
Before having a driver's license	2
Only if there is a problem / as needed	8
I don't know	9
Non response	12

Figures are rounded to the nearest whole number and therefore may not total 100

should be performed every 2 years, while 9% thought a visit every 6 months was appropriate. Eleven percent of respondents would visit every 5 years while 12 % thought they should only consult if there was a problem and 8% didn't know how often a routine eye examination should be performed.

When questioned on eligibility criteria for RAMQ coverage, 69% of respondents knew optometric

examinations are not covered for patients aged 18-64. Fifty-nine percent of respondents knew exam fees are covered for ocular emergencies regardless of patient age, while 58% correctly thought exam fees are covered for patients under 18. About half (49%) of respondents knew exam fees are covered for patients 65 and over. It is noteworthy that roughly a third of respondents reported being unaware of

these eligibility criteria for all of the coverage categories (Figure 1).

Scope of practice of eye care providers

Regarding the role of optometrists, most respondents believe they are the most appropriate eye care professional to consult to prescribe glasses (79%) and contact lenses (74%). Many respondents believe an optometrist is the most appropriate provider to examine a child with a deviated eye (49%), screen for eye diseases (39%) and to treat red eyes (28%). Few (12%) respondents believe optometrists are the most appropriate eye care providers to consult to remove a foreign body from the eye (Figure 2).

Common refractive errors

When questioned on common refractive errors, 65% of respondents correctly identified the symptoms of myopia as having "difficulty seeing details at a distance". A little over half (52%)

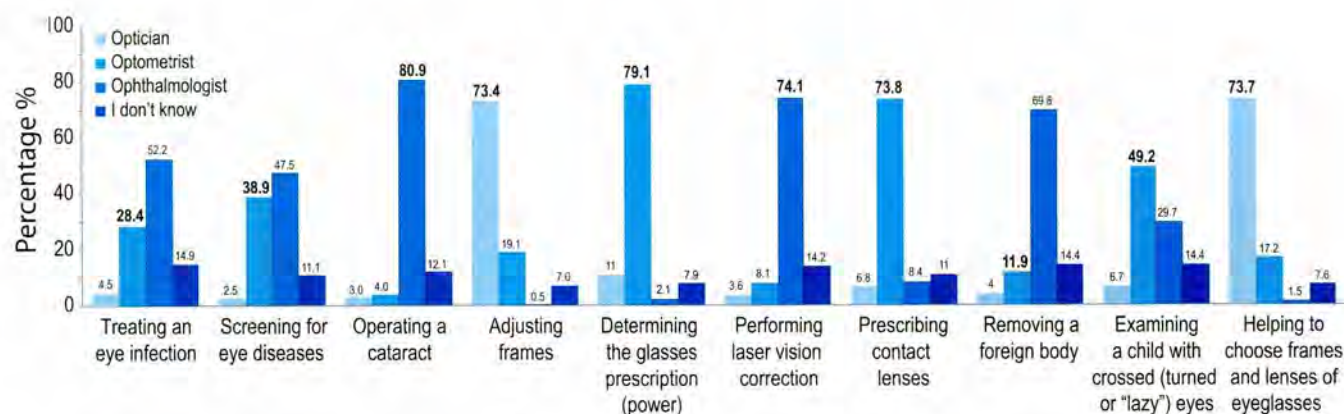


Figure 1 – Respondent knowledge of RAMQ coverage for optometric services. Bolded data represents the correct answer. N = 222.

The RAMQ offers coverage for patients:

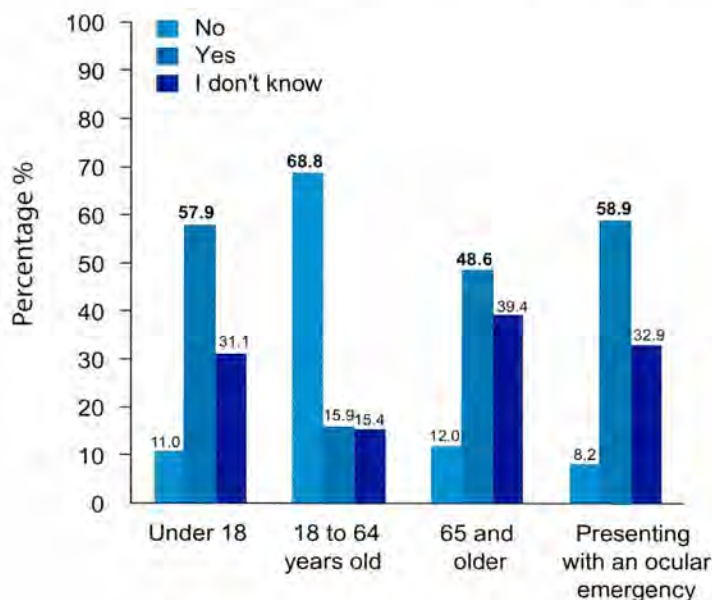


Figure 2: – Respondent knowledge of the scope of practice of eye care providers, in answer to the question “who is the most appropriate specialist to consult for?”. Bolded data represents the correct answer. N = 222.

the respondents correctly identified presbyopia as a “difficulty reading / seeing things up close”. Twenty five percent could identify hyperopia as a “difficulty reading / seeing things up close”.

Common eye diseases

Sixty one percent of our respondents reported knowing someone affected by cataracts, compared with 28% for glaucoma and 14% for age-related macular degeneration (ARMD). When asked “what is a cataract?”, only 22% of respondents correctly identified the condition

as “a lens inside the eye that becomes cloudy (less clear)”; a majority (52%) of respondents chose the distractor describing them as “a skin that covers the eye gradually”.

Respondents were then asked to answer six statements pertaining to risk factors, symptoms and treatment of cataracts (Table 2). Fifty nine percent of respondents had a good knowledge (5-6 correct answers out of 6) and 16% a poor knowledge (1-2 correct answers out of 6) of the disease.

Pertaining to glaucoma, 45% of respondents correctly identified the disease as “an elevated pressure inside the eye”. When questioned on symptoms, risk factors and treatments, 22% and 5% scored “average” (3-4 correct answers out of 6) and “good”, respectively. Only 12% of respondents knew glaucoma did not necessarily cause blurry vision (Table 2).

While 28% of respondents identified ARMD as “the accelerated ageing of the retina”, roughly half (52%) declared not knowing the nature of the disease. On further questioning about symptoms, risk factors and treatments, only 19% had an “average” score and 3% of respondents obtained a “good” score (Table 2).

Discussion

An informed public is considered more likely to seek medical care, understand and implement preventative measures, as well as comply with recommended treatments.^{9, 10, 11, 12} This study provides a glimpse of our sample population’s awareness of the details pertaining to optometric examinations and RAMQ coverage, as well as their knowledge regarding definition, symptoms, risk factors, prevention and treatment of common refraction problems and eye diseases.

Knowledge on the guidelines of eye examinations (reason for visit, age at first visit, frequency of routine examinations) is generally good amongst our respondents.

Table 2: Respondant knowledge of risk factors, symptoms and treatments of common eye diseases (n=222)

	Yes (%)	No (%)	Don't know (%)	Non response (%)
Cataracts:				
Cause pain	10	62*	28	13
Cause blurry vision	85*	2	13	8
Are treated with glasses	7	80*	13	14
Are treated by surgery	89*	3	8	9
Affect mainly older people	74*	14	12	9
Are treated by a very risky surgery	8	68*	24	8
Glaucoma				
Causes blurry vision	40	12*	48	19
Affects black people more often	6*	18	77	19
Can be diagnosed by a family doctor	20	31*	49	19
Can cause blindness	57*	4	39	15
Is reversible (can be cured)	26	23*	51	18
May be controlled by medication	39*	6	55	18
ARMD				
Does not affect vision	3	55*	42	18
Affects smokers more often	13*	11	77	19
Affects white people more often	6*	9	86	19
May be controlled by medication	15	19*	66	19
Is reversible (can be cured)	16	25*	59	17
Is the main cause of vision loss in Canada	19*	2	79	19

Figures are rounded to the nearest whole number and therefore may not total 100

* Represents the correct answer

The Canadian Association of Optometrists (CAO) recommends that children have their first eye examination between the ages of 6 and 9 months, and at least one examination between the ages of 2 and 5.⁵ Although very few of our respondents believe a child should undergo an examination before one year of age, almost two-thirds do believe an exam is in order before 5 years of age. The CAO further recommends yearly examinations for school aged children (6 to 19)

as well as adults over 64, and bi-yearly examinations for adults 20 to 64 years of age.⁵ Although our question was not broken down into age categories for simplicity's sake, slightly fewer than two-thirds of our respondents believe a person with no vision problem should consult an eye doctor for a routine check-up every 2 years.

Awareness of the particular details of RAMQ coverage was fair. A little over half of our respondents knew routine optometric

eye examinations are covered for patients under 18 years of age and for patients of any age presenting with an ocular emergency. However, with just under half of respondents knowing examination fees are covered for patients 65 and over, there remains room for improvement. Older patients are more at risk of developing eye diseases: it is estimated that about a third of the over 65 population has some form of vision-impairing eye disease such as cataracts, ARMD, glaucoma and diabetic retinopathy¹³, all of which have modifiable risk factors and/or effective therapy. Since it is believed that insured services lead to a higher utilization of services⁴, it is fair to speculate that knowing eye care examinations are covered would prompt patients to seek preventative and timely care, leading to earlier diagnosis and potentially better outcomes. Better informing the population on RAMQ coverage could lead to a more efficient utilization of eye care services by this at-risk group.

Our study revealed respondents are well aware of the scope of practice of the different eye care providers. However, few respondents associated optometrists as the most appropriate professional to consult for diagnosing eye diseases, treating red eyes and removing superficial foreign body from the eyes. This scope of practice is relatively new in the province, as the first licences entitling optometrists to use therapeutic agents were issued in 2003¹⁴; this might explain why most respondents still attribute these roles to ophthalmologists. Further

public education is required in order to position optometrists as primary eye care professionals that are more readily available than ophthalmologists for routine exams and more qualified than general practitioners for emergency consult.

Knowledge about common refractive errors was generally fair. A little over two-thirds and one half of respondents could correctly identify myopia and presbyopia, respectively. However, knowledge of hyperopia was low, with only a quarter of respondent showing some knowledge of the condition.

"Awareness" of a disease is generally considered as having heard of the disease, while "knowledge" is usually defined as having some understanding of the disease.^{9, 10, 15} Several studies in different settings generally report population awareness that is highest in the case of cataracts^{8, 10, 11, 16}, lower for glaucoma^{8, 11, 16, 20} and lowest in the case of ARMD.^{8, 10, 11, 16, 21, 22}

Our work inquired about knowledge of eye diseases. While only about a quarter of our respondents could correctly identify the definition of a cataract, most showed a good understanding of the disease. These results compare favourably to those from other studies who report 20% to 74% of respondents showing some knowledge of the disease.^{8, 10, 11, 16} Although these results are encouraging, they also contribute to the pool of knowledge pointing towards the need to strengthen the general public's awareness of cataracts as a cause of avoidable and reversible vision loss, even in developed countries.²³

With almost half of respondents that can identify glaucoma as "an elevated pressure inside the eye" and about a quarter having at least an "average" knowledge of the disease, our results are comparable to those out of several other studies showing an understanding of the disease in 10-35% of respondents.^{10, 16, 20}

ARMD is the least known disease, with about a third of our respondents that could identify the disease and very few having a good or average knowledge of it. This also compares favourably to other studies reporting between 1%-26% of respondents with knowledge of the disease.^{10, 11, 16, 21}

It is thought education aimed at increasing the public's awareness and knowledge of common eye diseases is an important step to prevent avoidable vision loss.²⁴ Although improved awareness does not necessarily lead to improved knowledge¹⁷, it does seem to influence self-care practices: population based studies report that people with an awareness and knowledge of an ocular disease are more likely to access eye care.^{9, 10, 11, 12} Eye health education may diminish the impact of eye diseases by leading people to seek preventative screening exams as well as by prompting timely eye examination when symptoms present, potentially leading to early diagnosis and treatment.

Limits of our study include an unknown response rate, as we do not know to how many patients the questionnaire was originally distributed. Limits also include a convenience sample that was taken from patients of an optometric practice,

thus already actively engaged in the eye care system and perhaps more knowledgeable of the modalities surrounding eye examinations than the general public. Our volunteer enrolment may also have elicited higher participation rates from respondents feeling more confident in their knowledge relating to eye examinations and eye conditions. Sixty percent of our respondents are university-educated, which may also affect the results: several studies have associated a higher level of education with a better awareness and/or knowledge of eye diseases.^{8, 11, 15, 16, 19, 21} For these reasons, it cannot be assumed our results establish an accurate portrait of the population of Québec.

Conclusion

Although our respondents seem well aware of the guidelines surrounding an ocular examination, education needs are still present regarding the age at which a child should undergo a first examination, as well as specific details of RAMQ coverage – particularly in the over 65 population, generally more at risk of eye disease. Likewise, there are many unmet needs in ocular health education in our sample population, especially regarding the signs, symptoms, risk factors and treatment options of several common sight-threatening diseases. Promotion of the role of optometrists as primary practitioners able to diagnose and treat ocular pathologies is also needed in order to insure better and more efficient access to eye care.

Aknowledgements

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Enantiomorphic Glaucoma Displayed in Monozygotic Twins

BY KIMBERLY M. DILLIVAN OD, FFAO

Introduction

The simplest definition of primary open-angle glaucoma (POAG) is a progressive excavation of the optic disc with corresponding visual field loss.¹ Approximately 44.7 million people in the world suffer from open-angle glaucoma where that number is predicted to increase to 58.6 million by 2020.²

Alarming, more than half of the people with POAG in developed countries remain undiagnosed.^{1,3} In the United States alone, 2.71 million persons are affected and according to the Canadian National Institute for the Blind, an estimated 250,000 Canadians have open-angle glaucoma.^{4,5} Overall, glaucoma is the second leading cause of blindness in the world, where POAG is the most common type among European or African descent.^{6,7}

Though today's treatments have become increasingly more effective in controlling POAG, research is still unable to isolate its true etiology. The most popular beliefs are the vascular theory, the mechanical theory, and the genetic theory which is gaining support due to improved genetic testing.

Twin studies are conducted in numerous medical disciplines to gain further knowledge about a specific disease with the prospect of developing better treatments or

ABSTRACT | RÉSUMÉ

Background: Numerous theories exist about the etiology of glaucoma and various forms of research, including twin studies, are conducted to provide answers. Twin studies are an exceptional method of examining the genetic and environmental influences on primary open-angle glaucoma (POAG) since comparison of monozygotic and dizygotic twins can infer a genetic causative factor.

Case Report: A pair of monozygotic twins revealed strikingly similar examination results with the eventual diagnosis of POAG. Visual fields and fundus photography revealed enantiomorphic, or mirror image, likeness. The right eye of twin one (T1) and the left eye of twin two (T2) displayed a repeatable inferior arcuate defect and retinal nerve fiber layer defects (RNFL).

Conclusion: An obvious genetic link within POAG is demonstrated by these twins. A dual case presentation will be described and a conclusion of the genetic backbone of glaucoma will be presented with supporting research. These studies provide information on genes responsible for POAG, environmental factors inducing POAG, and more insight for clinicians and patients so that better treatments may evolve in the future.

Keywords: Primary open-angle glaucoma, monozygotic twins, genetics, Humphrey Visual Fields, nerve fiber layer defect

Contexte : Il existe de nombreuses théories concernant l'étiologie du glaucome et diverses formes de recherche sont menées pour obtenir des réponses, notamment les études sur les jumeaux. Les études gémellaires sont une méthode exceptionnelle pour examiner les incidences génétiques et environnementales sur le glaucome primitif à angle ouvert (GPAO), puisque la comparaison des jumeaux monozygotes et dizygotes peut permettre de déduire l'existence d'un facteur causal génétique.

Rapport de cas : Une paire de jumeaux monozygotes ont obtenu des résultats d'examen étonnamment semblables à l'éventuel diagnostic du GPAO. La photographie des champs visuels et du fond de l'œil a révélé une ressemblance énantiomorphe, ou image miroir. L'œil droit du jumeau un (J1) et l'œil gauche du jumeau deux (J2) présentaient une anomalie reproductible de l'arc inférieur et des anomalies dans la couche de fibres nerveuses rétinienne (CFNR).

Conclusion : Ces jumeaux démontrent un lien génétique évident dans le GPAO. On fera l'exposé de la description de ces deux cas et la conclusion du fondement génétique du glaucome sera présentée avec la recherche à l'appui. Ces études fournissent de l'information sur les gènes responsables du GPAO et sur les facteurs environnementaux déclencheurs du GPAO. En outre, elles permettent aux cliniciens et aux patients de mieux comprendre le problème afin d'élaborer de meilleurs traitements à l'avenir.

Mots clés : Glaucome primitif à angle ouvert, jumeaux monozygotes, génétique, champ visuel Humphrey, anomalie de la couche des fibres nerveuses

a cure. Often twin studies compare monozygotic and dizygotic twins who display the disease to determine the genetic and environmental causes of the ailment.

A pair of monozygotic African American female twins presented to the clinic where each were diagnosed with primary open-angle glaucoma. The diagnostic data obtained from these monozygotic twins were strikingly similar. While the intraocular pressures (IOP) and pachymetry measurements were nearly identical, information from Humphrey Visual Fields (HVF) and fundus photography reveal enantiomorphic, or mirror image, likeness. The right eye of Twin One (T1) displayed a repeatable inferior arcuate defect while Twin Two's (T2) left eye displayed the same defect and each correlate with RNFL wedge defects. An obvious genetic link is present and is demonstrated within these monozygotic twins. A dual case presentation, with case data over twelve years, will be described in detail along with supporting research on the genetic backbone of glaucoma and twin studies

Case Report Twin One

In 2000, a 45-year-old African American female (T1) presented to the clinic for a routine eye examination with a chief complaint of blur with her glasses. Her social history was negative for alcohol and drug abuse and smoking; she was married and worked the night shift. Family history was positive for glaucoma where her father had become legally blind. Her medical history

was positive for migraine headaches, hypothyroidism, carpal tunnel syndrome, hypertension, hyperlipidemia, and temporomandibular joint disorder. She was being treated for hypothyroidism with 0.125mg Synthroid one tablet daily.

Best corrected visual acuity (BCVA) of the right eye (OD) was 20/20 (6/6) and the left eye (OS) was 20/20 (6/6) with a mild myopic prescription OD: -1.00 sphere and OS: -0.25 sphere. She was negative for an afferent pupillary defect, extraocular muscles were intact in both eyes (OU) and confrontational visual fields were full OU. Biomicroscopy was unremarkable OU and Goldmann tonometry readings were 17mmHg OD, OS. Upon dilated fundus examination, the cup-to-disc ratio (C/D) was 0.40h/0.40v OU with healthy rim tissue and an unremarkable fundus. The patient was to be monitored annually due to a family history of glaucoma.

In 2003, the patient returned to clinic for a routine examination. Her BCVA remained stable with a mild myopic prescription and all preliminary testing was consistent with previous examinations. Biomicroscopy was unremarkable OU and Goldmann tonometry readings were 14mmHg OD and 13mmHg OS. It was noted during fundus examination that the C/D ratio had enlarged and faint RNFL defects were noted in the superior and inferior arcades OD. The C/D ratio at that time was noted to be 0.50h/0.55v OD and 0.55 round OS. Both cups were deep and centered. The patient was diagnosed as a glaucoma suspect at

that visit due to C/D enlargement, RNFL defects, and a positive family history of glaucoma. A glaucoma work-up was ordered for the next visit.

Over the course of three years, ancillary testing revealed pachymetry measurements 585µm OD and 586µm OS, gonioscopy open to ciliary body 360 degrees without angle recession or neovascular vessels OU, multiple reliable visual fields, and high intraocular pressures of 18mmHg OD and 17mmHg OS.

At a 2006 examination, her IOPs were 15mmHg OD and 14mmHg OS. The patient was diagnosed with POAG due to three reliable HVFs which revealed a classic repeatable inferior arcuate defect OD and scattered non-glaucomatous defects OS. (*Figure 1*) In addition, dilation at that visit revealed the C/D ratio had further enlarged to 0.60h/0.65v with inferior temporal thinning and sloping without notching OD and 0.55h/0.60v with inferior temporal thinning and sloping without notching OS. Retinal nerve fiber layer defects were again noted, but denser and well defined slit defects superior temporal greater than the RNFL defect inferior temporal OD. Left eye RNFL defects were not as well defined as OD. (*Figure 2*) The patient was started on timolol 1 gt QAM OU since she preferred morning dosing and returned to the clinic to assess the effectiveness of the therapeutic intervention. Target pressures were set for a range of 10-12mmHg based upon a 25-30% reduction from high IOPs.

At the three month follow-up the patient self-discontinued the timolol because she stated it made her migraines worse. Travatan Z 1 gt QHS OU was initiated and she continued that treatment for five years with a median IOP measurement of 12mmHg OU. The patient was monitored every three to four months. Over the course of five years, the glaucoma testing data remained stable with no changes in IOP, C/D ratio, RNFL defects, or HVFs.

In 2011, T1 was switched to the prostaglandin latanoprost 1 gt QHS due to cost of generic formulation. Median pressures were 13mmHg OU and she is currently on this treatment. *Figure 3* displays T1's historical IOP measurements based upon treatment modality. Most recently, in July of 2012, T1 completed another HVF where the OS was clean; however, there was possible progression OD noted as an early superior nasal defect. (*Figure 4*) She has been scheduled to return to complete a HVF to determine repeatability.

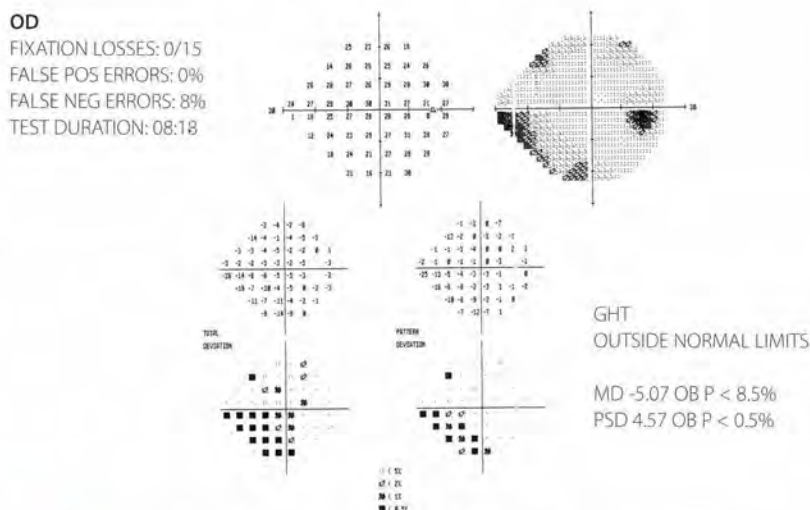


Figure 1— T1 Humphrey Visual Field OD, T1's HVF in 2006 demonstrating a repeatable inferior arcuate defect OD.

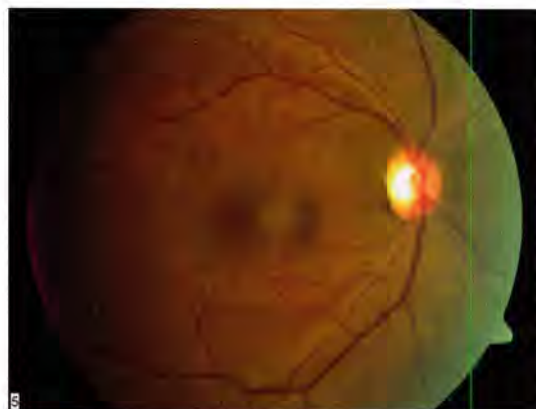


Figure 2— T1 color photography OD. Note the dense RNFL wedge defects superior arcade.

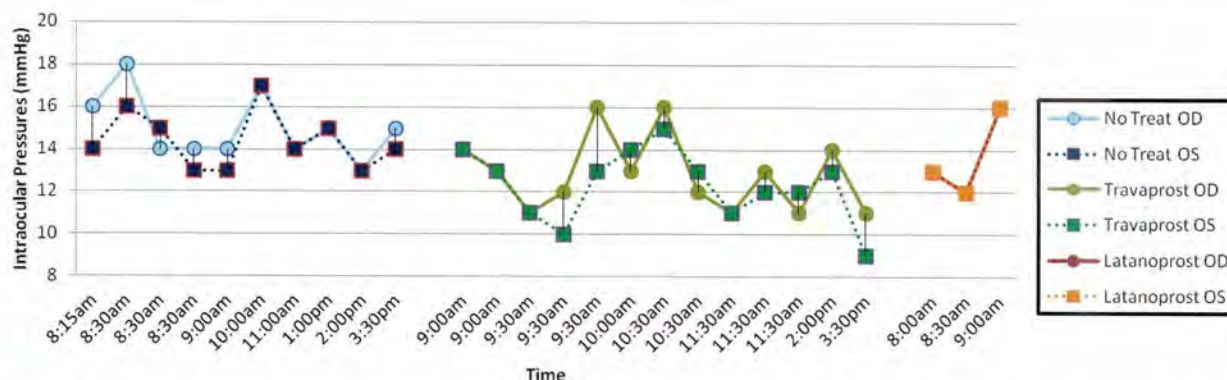


Figure 3— Twelve year history of Twin One's intraocular pressures, based upon time of day, while on no treatment, on travaprost OU, and on latanoprost OU.

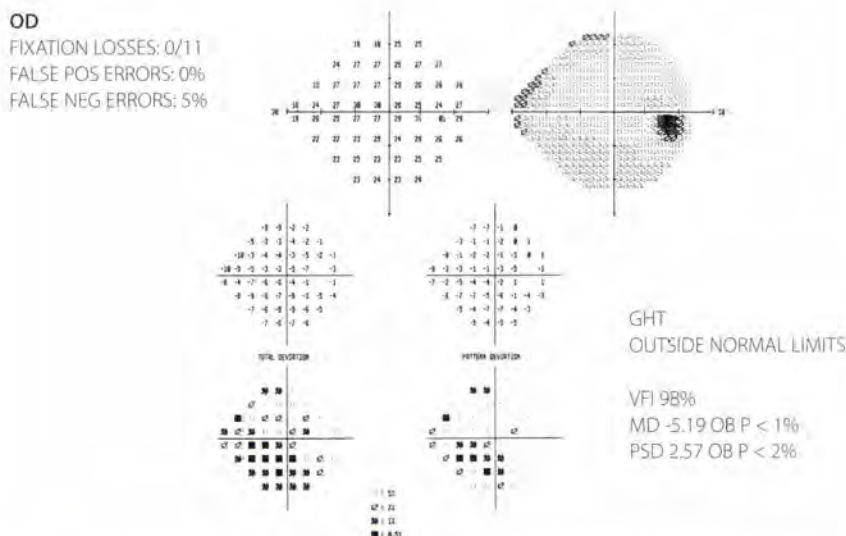


Figure 4 – T1 2012 HVF revealing a stable inferior arcuate defect with a progressing superior nasal step.



Figure 5 – T2 color photography OS. Note the dense RNFL wedge defects superior arcade.

Case Report Twin Two

In 2002, a 48-year-old African American female (T2) presented to the clinic for near vision blur. Her social history was negative for alcohol and drug abuse and smoking; she was single and worked the day shift. Family history was positive for glaucoma where her father had become legally blind.

Her medical history was positive for migraine headaches, hypothyroidism, carpal tunnel syndrome, hypertension, hyperlipidemia, and temporomandibular joint disorder. She was being treated with 0.125mg Synthroid one tablet daily to treat her hypothyroidism.

Best corrected visual acuities were 20/25 (6/7.5) OD and 20/20 (6/6) OS with an anisometric

refraction OD: +1.75 sphere and OS: -0.25 sphere. She was negative for an afferent pupillary defect, extraocular muscles were intact OU and confrontational visual fields were full OU. Biomicroscopy was unremarkable OU and Goldmann tonometry readings were 19mmHg OD, OS. Dilated fundus examination revealed a C/D ratio of 0.40 round OD and 0.35 round OS with healthy rim tissue OU. A chorioretinal scar was noted at the inferior terminal arcades in the mid-periphery, otherwise fundus examination was unremarkable. She was monitored annually due to a family history of glaucoma.

In 2006, T2 returned with a concern of glaucoma. She stated that her identical twin sister, T1, had recently been diagnosed with glaucoma and that she shared nearly every diagnosis and disease with her twin. A complete examination and glaucoma work-up was initiated. Her preliminary examination was stable from previous examinations with an anisometric refraction. Intraocular pressures at that examination were 17mmHg OD, OS. Dilated examination revealed a change in C/D ratios to 0.30h/0.45v deep and centered OD and 0.25h/0.45v with moderate depth and centered OS. Retinal nerve fiber layer defects were noted superiorly OD and in the left eye with a denser defect inferiorly than superiorly. (Figure 5) Pachymetry measurements were 591mm OD and 585mm OS. Gonioscopy was open to ciliary body 360 degrees without angle recession or neovascular vessels OU. The HVF taken

OS

FIXATION LOSSES: 2/14
FALSE POS ERRORS: 1%
FALSE NEG ERRORS: 7%

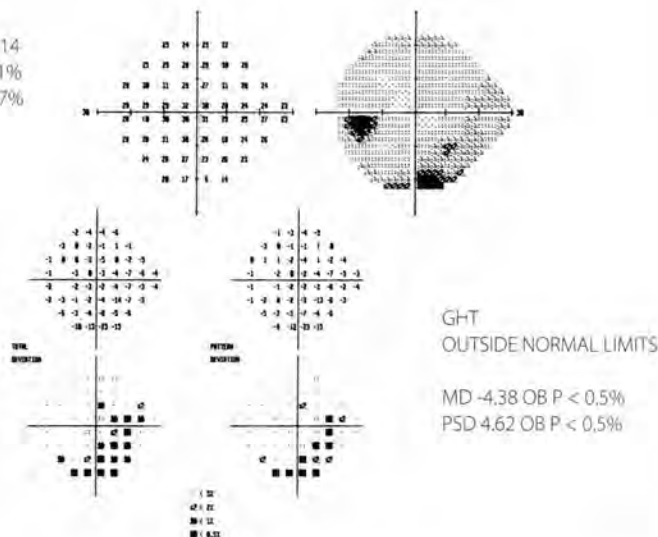


Figure 6 – T2's HVFs in 2006 demonstrating a repeatable inferior arcuate defect OS.

was reliable and revealed scattered non-glaucomatous defects OD and an inferior arcuate OS. (Figure 6) Due to the positive family history, enlargement of C/D ratios, the HVF, and strikingly similar test results with her monozygotic twin, T2 was placed on Travatan Z 1 gt QHS OU and was continually monitored.

At follow-up, the patient admitted to non-compliance with medication with tonometry reading of 15mmHg OD, OS. Over four years of monitoring, the patient became more compliant with a median IOP of 13mmHg OD, OS. Multiple fields were taken to reveal a stable inferior arcuate defect OS and non-glaucomatous fields OD. Cup-to-disc ratios remained stable

until 2010 when another enlargement was noted of 0.3h/0.5v OD and 0.25h/0.55h OS with thinning inferior temporal and RNFL defects densest superior temporally OS. The visual fields were stable, but T2 was switched to latanoprost, 1 gt QHS OU, in 2012 with IOP measurements of 13mmHg OD and 14mmHg OS. Figure 7 displays T2's historical IOP measurements based upon treatment modality. Recently, in November 2012, another HVF was completed to reveal a clean field OD and inferior arcuate defect OS with possible progression as a superior nasal step defect. (Figure 8) Twin Two has been scheduled to return for a HVF to determine repeatability.

Management

Since both twin's visual fields were stable over many years, there was a thought that both these twins did not have POAG, but rather a congenital or ischemic anomaly affecting the optic nerve causing field defects. Multiple imaging, including a MRI and CT of the

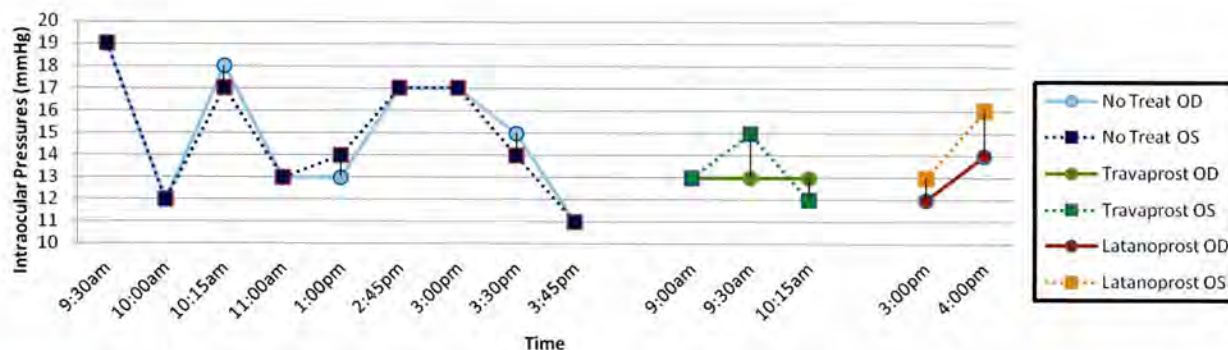


Figure 7 – Ten year history of Twin Two's intraocular pressure, based upon time of day, while on no treatment, on travaprost OU, and latanoprost OU.

OS

FIXATION LOSSES: 1/12
FALSE POS ERRORS: 0%
FALSE NEG ERRORS: 16%

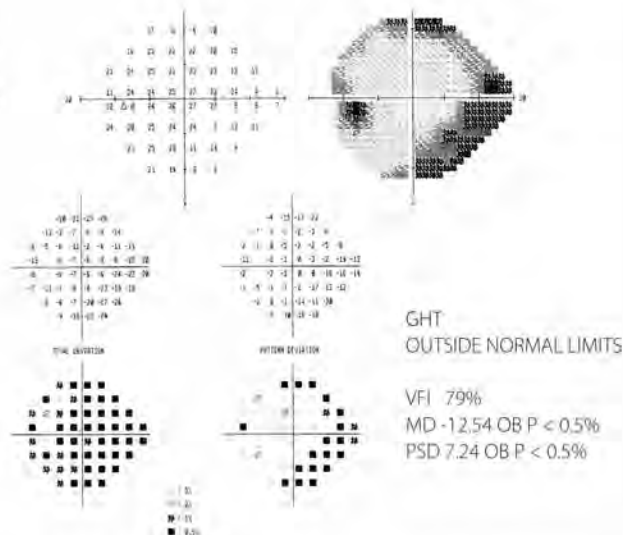


Figure 8 – T2 2012 HVF revealing a stable inferior arcuate defect with a progressing superior nasal step.

brain, orbits and neck, were taken of the twins between 2007 and 2011 and revealed no pathology that was consistent with their field defects. Recent progression in the visual fields confirmed a progressive optic neuropathy consistent with glaucoma, thus discounting a congenital defect or ischemic event. Since the progression was an early superior nasal step of the right eye of T1 and the left eye of T2, both twins are scheduled to complete another HVF to determine repeatability. Additional therapeutic intervention will likely be initiated in the future.

T1 and T2 were labeled as POAG as opposed to normal tension glaucoma (NTG) due to many factors. The criteria for defining NTG in the literature have been inconsistent. Among 63 retrospective studies, IOPs categorized as NTG ranged from 17 to 26mmHg.⁸

In addition, several studies use characteristic optic disc findings and visual field findings to define glaucoma. Drance hemorrhages, peripapillary atrophy, and more deep cupping tend to occur more often in NTG.^{8,9} Normal tension field defects tend to be central or centrocaecal and some studies show a superior hemifield tendency.^{8,10,11} On the other hand, multiple studies have found no differences between optic disc parameters or visual fields between POAG and NTG.^{8,11,12} The Baltimore Eye Study found no support for the distinction between low-tension and high-tension glaucoma.⁹ Since NTG and POAG are managed the same and neither twin displayed any characteristic visual field or optic nerve findings consistent with NTG both twins were diagnosed as POAG.

Genetics of Glaucoma

Monozygotic twins are derived from a single fertilized ovum, thereby making their genetic material identical. On the other hand, dizygotic twins are no more genetically similar than siblings since two fertilized eggs are present. Twin studies are an exceptional method of examining the importance of genetic and environmental influences on a phenotype since they attempt to calculate the maximum genetic contribution to a trait. Both groups, monozygotic and dizygotic groups, tend to share a similar environment during the first two decades of life, but only one group is genetically identical. By comparing the two groups and calculating the statistical difference between the two, research can infer a genetic causative factor of a certain disease. These studies provide clues to a specific gene responsible for POAG, help determine environmental influences on POAG, and most importantly, they advance our knowledge about the disease to better educate our patients and implement more effective treatments in the future.^{6,7,13-16}

Table 1 outlines T1 and T2 similarities. Pachymetry measurements were nearly identical and this coincides with twin research stating central corneal thickness measurements are more highly correlated in monozygotic twins (0.95) than in dizygotic twins (0.52) which suggests a very strong genetic influence.¹⁶ Intraocular pressures between T1 and T2 are similar which is also supported by several twin studies

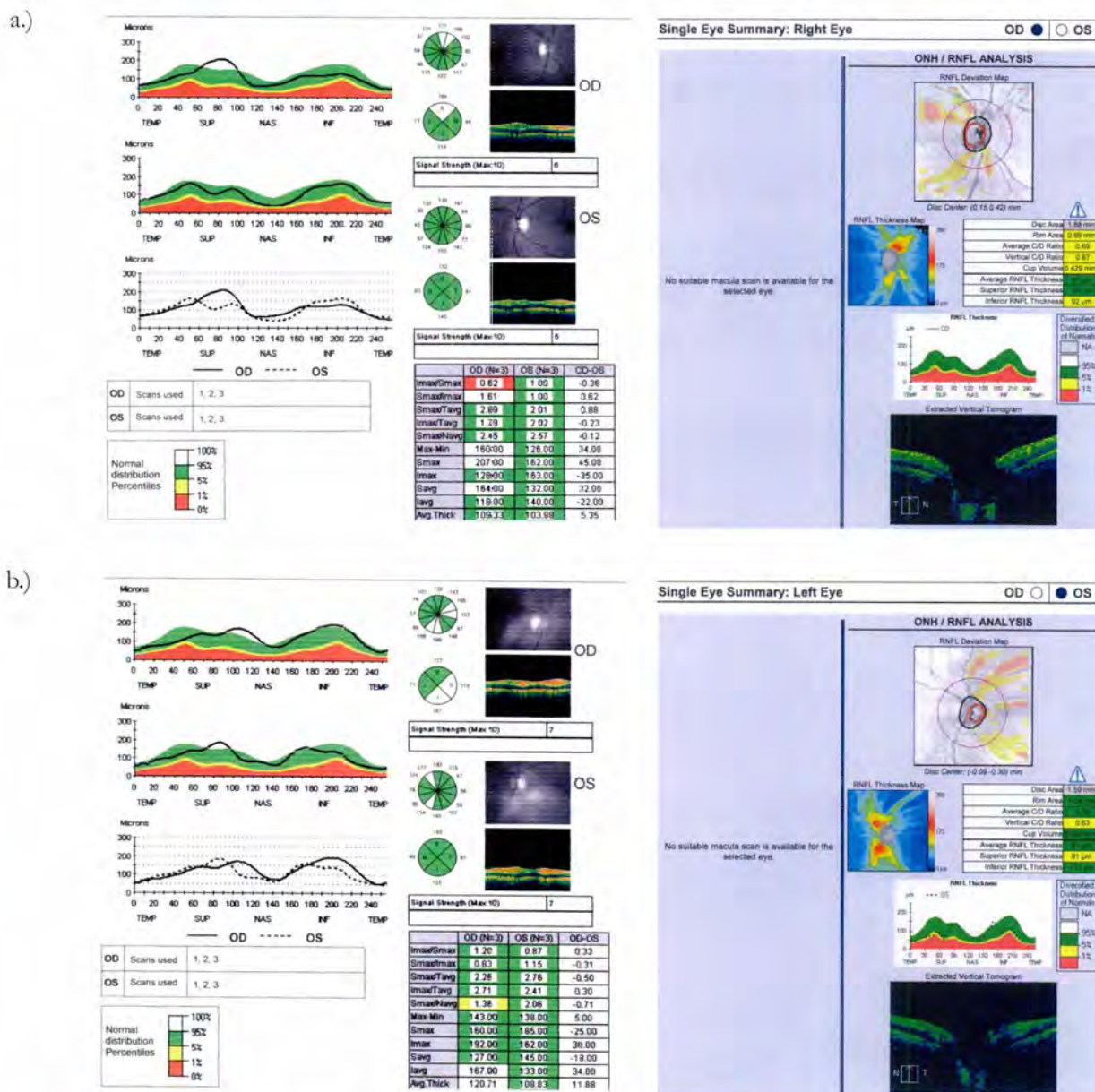


Figure 9 – Comparison of each twin's optic nerve parameters shows T1 OD(a) parameters vary from T2 OS(b) optic nerve parameters.

where monozygotic twins show a higher correlation than between siblings, parent-child, and cousin pairs.⁷ Though the refractive error was remarkably different between T1 and T2, multiple studies have indicated that there is no correlation between POAG and refractive error, central corneal thickness and

refractive error, or optic disc parameters and refractive error.^{7,16,17} Twin studies on optic disc area and cup parameters have found a higher correlation between monozygotic twins (0.73/0.81) than between dizygotic twins (0.41/0.50).⁷ This suggests that disc area and cup are strongly influenced by genetic factors. The

disc parameters of T1 and T2 are different as noted by their C/D ratios and fundus photos. Additionally, the OCT in *Figure 9* highlights the differences in neuroretinal rim tissue thickness. Though T1 and T2's disc parameters are not significantly comparable, multiple studies have shown that many monozygotic

twins do not share similar optic disc parameters.¹³

Only a handful of studies have been conducted that specifically address the heritability of POAG among twins and family members. A retrospective Finnish twin study consisted of 108 twin pairs with POAG, where 29 twin pairs were monozygotic and 79 twin pairs were dizygotic. Their research concluded that only 13% of POAG could be explained by genetic factors and the other 87% remained to be explained by non-genetic factors.¹⁸

However, opposite results were found by Gottfredsdottir et al. where they devised a very clever study addressing the shared environment between monozygotic twins versus the shared environment between twins and their spouses. The study found POAG was significantly more concordant in monozygotic twin pairs (98.0%) than their spouses (70.2%) suggesting there is a definite importance on genetic factors and less emphasis placed upon a shared environment. Other ocular parameters that were tested included intraocular pressure, axial length, anterior chamber depth, refractive error, and C/D ratio. It was determined that IOP was highly correlated between twin pairs ($p < 0.0001$) and correlated with POAG. The other parameters were highly correlated between the monozygotic twins only, but those ocular parameters were not directly correlated with POAG.¹⁸ The Beaver Dam Eye Study determined that optic nerve parameters and IOP are more strongly correlated in siblings than in cousins, stating the

correlations for ocular parameters were compatible with the amount of gene sharing.^{1,19} Further evidence that suggests POAG has a genetic backbone is exhibited by Africans who are estimated to have a six times greater chance of developing POAG. The finding of similar prevalence in Africans and African Americans lessens the likelihood that such differences are primarily due to environmental factors.¹ Based upon research, it appears that genetics have a very strong influence on POAG; however, many articles state additional contribution from the environment.

A patient who has a blood relative with glaucoma, automatically has a 22% lifetime risk of developing glaucoma. In addition, that patient has a 10× higher risk of developing glaucoma compared to patients without a family history. This suggests that at least 1/6 of all glaucoma cases in the general population may be caused by a genetic factor.²⁰ Glaucoma develops in as many as 16% of first-degree relatives of those with POAG compared with fewer than 2% of the general population.¹⁸ Though POAG can be inherited as a Mendelian autosomal-dominant or autosomal recessive trait, it is believed that the most probable form of genetic transmission of POAG is a complex multifactorial trait where multiple genes interact to yield the disease.²¹

The visual field progression of T1 and T2 are very similar, though not perfectly identical. To the authors knowledge, there is no known literature that describes

identical glaucoma in twins. Fried et al. described a case of seven-year-old identical female twins, verified by blood testing, where only one twin had congenital glaucoma. Fried et al. concluded that non-genetic influences were involved and were likely caused by a multifactorial inheritance.²² In another case, a monozygotic twin pair developed POAG; however, one twin developed POAG 20 years after the first. The authors attributed the large chronological difference due to environmental factors.²³ A third case cites 44-year-old monozygotic twins with NTG. The first twin displayed inferonasal defects OD and OS, a C/D ratio of 0.7h/0.7v OU, and a splinter hemorrhage OS. The other twin also had a C/D ratio of 0.7h/0.7v OU, but the splinter hemorrhage was of the opposite eye and an inferonasal defect of the left eye only. The authors stated there was likely a genetic influence, but due to the large differences between each twin's data, there were probably many factors that effected the varying degree of their NTG.²⁴ There have been two documented cases of mirror-imaged congenital glaucoma in monozygotic twins.^{25,26} Both cases found each twin pair had similar, but not identical, case presentations. One case of a 7-year-old monozygotic twin pair, proven by blood work, described the right eye of one twin with proptosis, severely reduced vision, and markedly elevated IOP prior to goniotomy. The other twin's left eye was affected, but had significantly less severe findings than his counterpart.²⁶ All the above cases mentioned display

an obvious genetic link; however, each twin pair described have some degree of dissimilarity. Each author attributes the discordant glaucoma to other factors including environment.

Comparison of T1 and T2 diagnostic data are strikingly similar. With over a decade of diagnostic

data, the monozygotic twins reveal enantiomorphic, or mirror image, likeness of the fundus and of the visual fields. (Figure 10,11) The right eye of T1 displays a RNFL defect densest superior temporal with a corresponding inferior arcuate field defect where T2 displays the same, but in the left eye. The most recent

HVF data suggests that both the twins are progressing in a similar manner where an early superior nasal step has been noted OD in T1 and OS in T2. (Figure 12) Based upon the last HVFs taken, T2's HVF appears to be progressing slightly faster. Past literature review shows that this is not uncommon especially since current scientific belief is that POAG is due to a complex multifactorial trait with numerous genes interacting to create the disease. In addition, one cannot discount environmental influences that vary between T1 and T2 which may have contributed to T2's faster progression.

Glaucoma Genes: Myocilin and Optineurin

After mapping the human genome in 2003 researchers realized that there were many functionally significant regions that were still

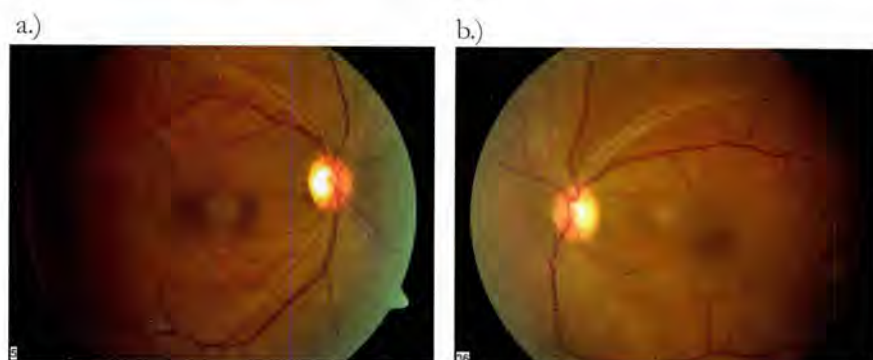


Figure 10 – Comparison of T1 OD(a) superior arcuate RNFL defect to T2 OS(b) superior arcuate RNFL defect reveals a mirror image likeness

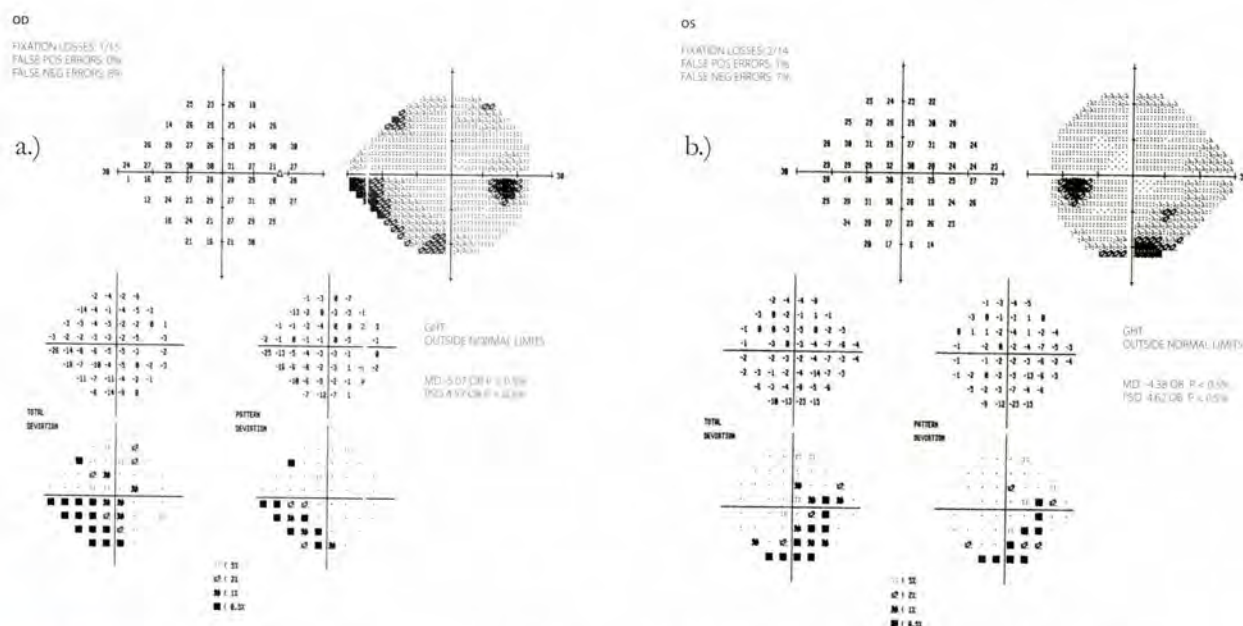


Figure 11 – Visual fields reveals an enantiomorphic vision loss. An inferior arcuate defect present in T1 OD(a) and T2 OS(b).

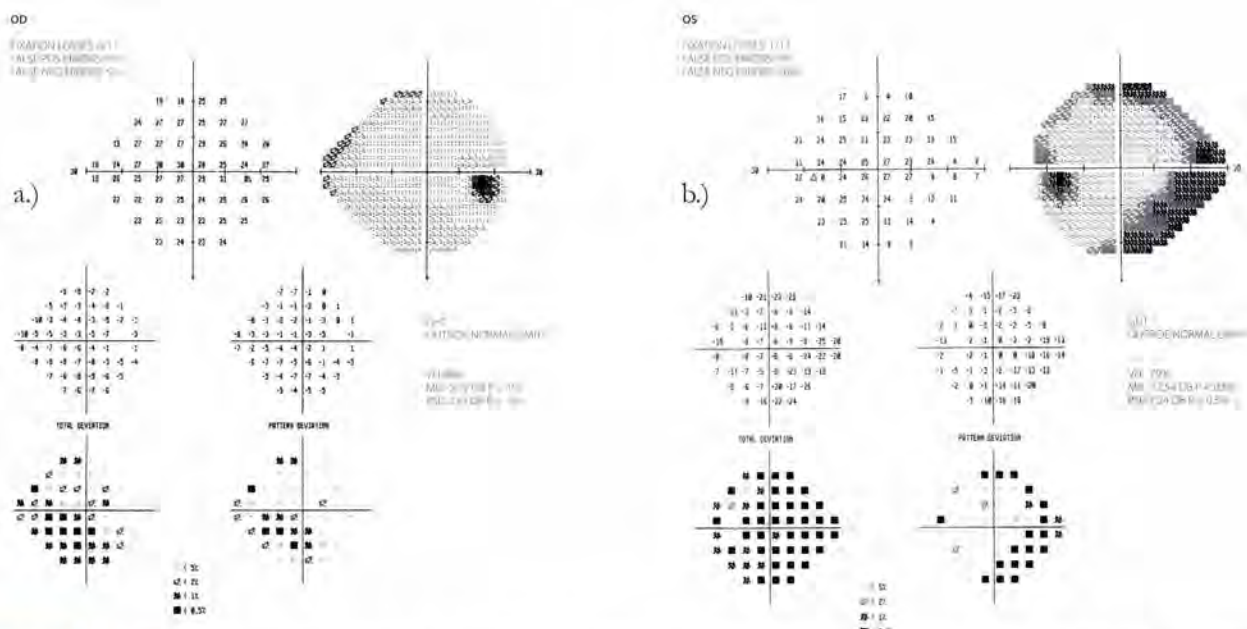


Figure 12 – Progression noted as a superior nasal defect in T1 OD(a) and T2(b). Progression appears to be greater in T2 seen as a superior nasal step extending into an arcuate.

unknown.¹ Through the human genome project, 14 chromosomal loci for POAG (GLC₁A-N) were found.²⁷ It is noteworthy that many of the accepted POAG loci have been identified from the same clinic base (e.g. GLC₁C, GLC₁F, GLC₁G).¹ There are an abundance of chromosomal loci that are believed to genetically influence POAG and are currently being researched.^{1,21,27-29} (Table 2) Of the numerous genes that are being investigated, there are two that have been repeatedly proven to be genetic markers for POAG.

The myocilin (MYOC) gene is found on the GLC₁A locus where it is known to cause up to 20% of patients with early-onset POAG and approximately 4% of cases of adult-onset POAG.²¹ Myocilin is found within the trabecular meshwork (TM) although its presence

is ubiquitous and found throughout the body. The pathogenesis of MYOC is poorly understood; however, it is thought to be a mutation of the myocilin protein and a key feature is elevated IOP where some mutations cause higher IOP than others, elevating up to 40mmHg. It is postulated that it is a failure to secrete myocilin leading to the accumulation of intracellular myocilin that begins injury or death to the TM cells. In turn, the altered TM cellular structure creates a resistance to the aqueous outflow and the IOP increases.²⁸ There are three known MYOC mutations, where the mildest form of POAG is caused by Gln368STOP, the intermediate form is Thr377Met and Gly252Arg, and the most severe form of POAG is coded Pro370Leu.^{6,13} It is interesting to note that individuals homozygous

for some MYOC mutations do not manifest severe disease like their heterozygous counterparts. This finding illustrates the complex nature of MYOC and may indicate other interactions that play a role.¹ (Figure 13) It is estimated that approximately one in 30 unselected POAG patients have a form of MYOC mutation, but the optic nerve in MYOC glaucoma appears no different than non-MYOC glaucoma.⁶ Currently, there is no cost-effective screening for the MYOC mutation.^{1,6,13,20}

A second POAG gene identified is the optineurin (OPTN) protein where it is located on the GLC₁E locus. It is expressed in the TM, nonpigmented ciliary epithelium, and retina; however, it is not ocular specific and is found elsewhere in the body. It plays a role in exocytosis, golgi ribbon formation,

and potentially involved in tumor necrosis (TNF- α) apoptotic pathways, which has been speculated to be one pathway involved in retinal ganglion cell apoptosis.^{13,21} It has been proposed that OPTN may function to protect the optic nerve from tissue necrosis mediated apoptosis and the mutation of this protein may increase retinal ganglion cell susceptibility to apoptosis.²¹ OPTN has been shown to be up-regulated after exposure to TNF- α and dexamethasone, but its response to elevated IOP remains controversial. Known mutations of OPTN include Glu50Lys leading to an aggressive form of POAG with a lower age of diagnosis.^{13,21,27} Mutations in OPTN account for approximately 16.7% of familial POAG, but only account for 0.1% of unselected POAG cases.¹³ Currently, there is no cost-effective screening for the OPTN mutation.^{1,6,13,20}

Conclusion

Although T1 and T2 have not undergone genetic testing to determine if there is a specific gene or genes causing their glaucoma, there is a clear and strong genetic component to the POAG of these monozygotic twins. Beside the fact that they have enantiomorphic likeness of the fundus and visual fields, where the right eye of T1 has a dense superior temporal RNFL defect corresponding to an inferior arcuate and the left eye of T2 has the same defects, strikingly similar progression has been noted recently. It should be noted that T2 does appear to be progressing slightly

Table 1 – Comparison of Twin One and Twin Two Ocular Data

	TWIN ONE	TWIN TWO	Twin Studies Heritability
Untreated High IOP (unadjusted)	OD: 18 mmHg OS: 17 mmHg	OD: 19 mmHg OS: 19 mmHg	Highly heritable
Median IOP with Prostaglandin (unadjusted)	OD: 12 mmHg OS: 12 mmHg	OD: 13 mmHg OS: 14 mmHg	No studies access treated IOP
Mode of Treatment	Travatan Z, Latanoprost 1 gt QHS OU	Travatan Z, Latanoprost 1 gt QHS OU	
Pachymetry	OD: 585 μ m OS: 586 μ m	OD: 591 μ m OS: 585 μ m	Highly heritable
Refractive Error	Non-anisometropic	Anisometropic	Not correlated with POAG
Optic Nerve Parameters and Retinal Nerve Fiber Layer	OD: .6H/.65V, thinnest inf/temp, major RNFL defect sup/temp OS: .55H/.6V, mild RNFL defect sup/temp	OD: .35H/.5V, possible sup/temp RNFL slit defect OS: .3H/.55V, dense RNFL wedge defect sup/temp	Heritable
Visual Field Defects	OD: Repeatable dense inferior arcuate defect OS: Essentially clean	OD: Essentially clean OS: Repeatable dense inferior arcuate defect	No previous studies
Correlating Systemic Diseases	Migraines, Hypothyroidism, Synthroid use	Migraines, Hypothyroidism, Synthroid use	No previous studies

Table 2 – Chromosomal Locations of Genes Associated with Glaucoma

Loci	Location (Gene)	Typical Phenotype
GLC1A	1q23-q25 (MYOC)	JOAG/POAG
GLC1B	2cen-q13	Adult-onset POAG
GLC1C	3q21-q24	Adult-onset POAG
GLC1D	8q23	Adult-onset POAG
GLC1E	10p15-p14 (OPTN)	NTG/POAG
GLC1F	7q35-q36	Adult-onset POAG
GLC1G	5q33-q35 (WDR36)	Adult-onset POAG
GLC1H	2p16-p15	Not Specified
GLC1I	15q11-q13	Adult-onset POAG
GLC1J	9q22	JOAG
GLC1K	20p12	JOAG
GLC3A	2p21 (CYP1B1)	Congenital glaucoma
GLC3B	1p36	Congenital glaucoma
AN2	11p13 (PAX6)	Aniridia
GPDS1	7q35-q36	Pigment dispersion syndrome
IRID1	6p25 (FOXC1)	Iridodysgenesis
LMX1B	9q34	Nail-patella glaucoma
MFRP	11q23	Nanophthalmos
NNO1	11p	Nanophthalmos
RIE1	4q25 (PITX2)	Rieger syndrome
RIE2	13q14	Rieger syndrome

faster than T1, assuming that the HVF is repeatable on return. The varying degrees of progression is likely due to the complex nature of POAG's multifactorial inheritance and/or environmental differences between T1 and T2. Other similarities were their pachymetry measurements and IOP, which coincide with various twin studies revealing IOP as a highly heritability trait. Though their refractive errors are dissimilar, twin studies have revealed that refractive error and POAG are not correlated. Optic disc area and cup area are highly heritable demonstrated by twin studies, but it has been noted throughout those twin studies, there were many cases of monozygotic twins whose optic nerve parameters were different, as seen in T1's and T2's OCTs, C/D ratios, and fundus photos. Numerous genes are currently theorized to play a role in POAG. Known genes such as MYOC and OPTN are responsible for only a fraction of POAG. As such, it seems that the inheritance of POAG is indeed based upon a complex multifactorial trait that is influenced not only by mutations, but other genes of which we currently do not have knowledge. Extensive genetic research is being conducted not only of the known genes, but the unknown genes and all their influences. The results of these ongoing investigations will provide more information on other genes responsible for POAG, environmental factors inducing POAG, and more insight for clinicians and patients so that better treatments may evolve in the future.

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