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CANADIAN JOURNAL OF OPTOMETRY | REVUE CANADIENNE D'OPTOMÉTRIE

VOL 71 NO 6 DECEMBER/DÉCEMBRE 2009

COST IMPLICATIONS OF CAO MEMBERSHIP

# LE RETARD DE MATURATION VISUELLE
## UN CAS CLINIQUE

# DELAYED VISUAL MATURATION
## A CLINICAL CASE

CANADIAN OPTOMETRY SCHOOLS ATTEND 'ACADEMY 2009 ORLANDO'

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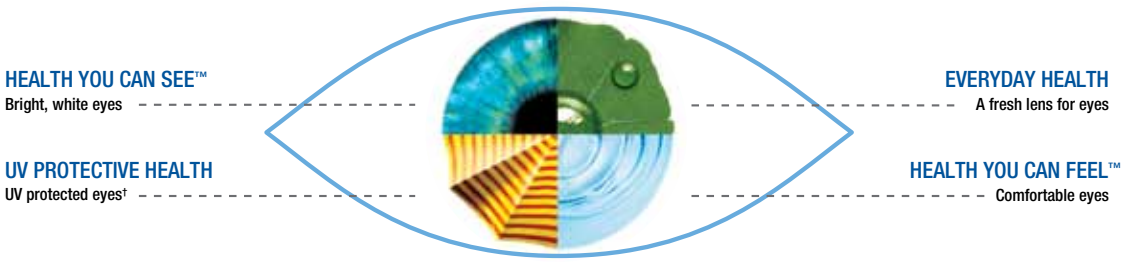


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**CONNECTING VISIONS**

# The Cost Implications of CAO Membership
# Les avantages versus les coûts de l'adhésion à l'ACO

by / par KIRSTEN NORTH, OD, PRESIDENT CAO/ PRÉSIDENTE DE L'ACO

As more of the provincial associations move to voluntary membership, there is an increased expectation for CAO and provincial associations to show the benefits of membership. CAO was asked to consider this from the perspective of costs, and whether there is a 'return on investment' from membership in CAO. The following is an overview using the most commonly asked questions about CAO membership fees.

**Q – What does it cost to be a CAO member?**

The annual CAO assessment has been $330 since 2004. In addition, members in each province consider the approval of an advertising levy which is currently $800 per member. The advertising levy goes directly to pay for television advertising.

**Q – Is this the fee/levy in all cases?**

No. In 1996, all provincial associations and CAO agreed on a funding formula that provides a rebate to the Quebec Association of Optometrists for its role in providing French language services. The rebate results in a net CAO assessment paid by CAO members in Quebec of $180 plus a $200 advertising levy.

CAO members also pay less if provincial associations offer reduced fees for certain membership categories. In these cases, the same percentage reduction is applied to the CAO assessment/levy. In addition, provincial associations which allow members to pay fees by credit card may withhold from CAO the merchant fee applied to these payments.

**Q – How is the CAO assessment set and collected?**

The CAO Council sets the CAO assessment a full fiscal year in advance to allow the provinces to budget appropriately. The provinces collect and remit the assessment to CAO. The advertising levy is recommended by the National Public Education Committee and is approved at provincial Annual General Meetings.

**Q – Can an optometrist opt out of CAO or join CAO directly?**

No. CAO was formed as a federation of the ten provincial associations in 1941. The CAO Charter dictates that a member of the provincial association is automatically a member of CAO and an annual assessment is collected. An optometrist may not choose to opt out of membership in the provincial association and join CAO directly.

**Q – How is CAO membership monitored?**

The provincial association advises CAO when there are changes in membership. Members who are no longer members of a provincial association are removed from the CAO database.

**Q – Are CAO programs and services available to members only?**

Yes. CAO has a strict policy that CAO programs and services are available to CAO members only. The policy applies to all programs.

**Q – Does CAO rely on member fees for its operations?**

Member fees are very important for CAO operations. In recent years, CAO has increased its sources

of non-dues income which allows for more member services without higher fees.

**Q – How does CAO membership compare to other national associations?**

In a 2008 survey, the average membership fee of large national, professional associations was $1,000.

**Q – Has the CAO membership been asked about its level of satisfaction with CAO fees?**

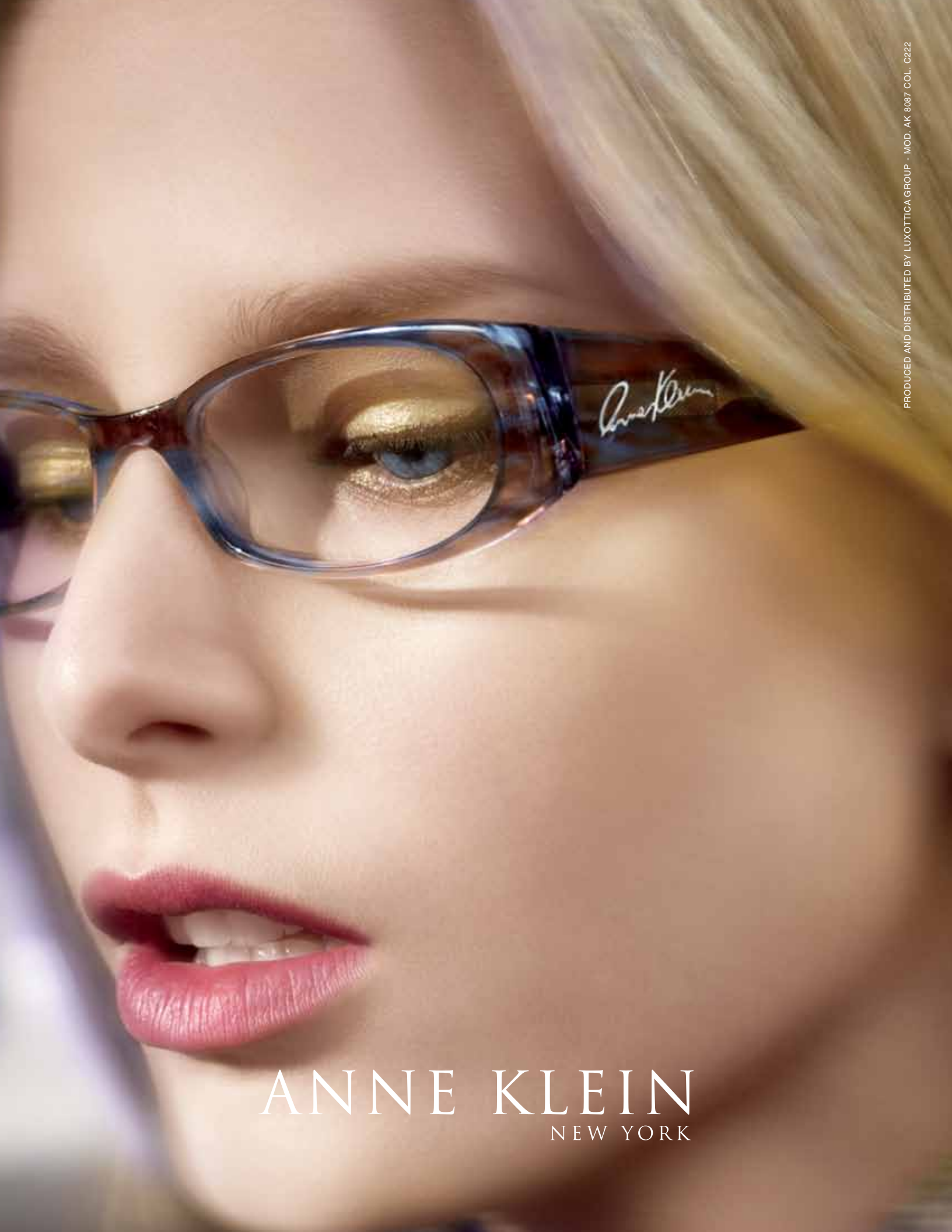
Yes. In 2007, a CAO membership satisfaction survey indicated that the highest percentage of members was 'satisfied' with the reasonableness of CAO fees. A similar result was found in 2003. The level of satisfaction was even higher for the $800 advertising levy. The 2007 CAO membership satisfaction survey found that there was an overall 75% satisfaction rating with CAO. In 2009, CAO conducted a membership survey to determine the level of satisfaction with CAO communications. Again, the overall level of satisfaction was high.

**Q – Are there examples of where CAO programs and services provide members with a 'return on their investment'?**

Specific programs offer financial benefits including:

- *National advertising program* – For every dollar paid, the value of the national buy is generally in the $1.60 range. This is possible because of the economies of scale and negotiating a television buy at a national level and because of 'spill' when television viewers see the ad in other regions.
- *Marketing costs* – CAO members recognize the need to promote the profession. At a practice level, this includes yellow page listings, advertising, signage, and more. The $800 advertising levy represents a portion of this cost and is effective in increasing the number of patients using Optometrists.
- *Professional liability insurance* – In 2009, the renewal rates were almost 25% lower than 2008. CAO members advise that independent purchase of a similar policy can be as high as $1,200 per year. These savings alone can offset membership fee costs.
- *Merchant credit card rates* – this program can save CAO members 2-5% on merchant rates charged by credit card processing companies.
- *Publications* – CAO members receive complimentary publications from CAO.
- *Staff education* – the Optometric Assistant Course is excellent value when compared to alternate courses for opticians and private sector training.
- *Print and web materials* – the cost of brochures and fact sheets has been found to be 20% less from CAO than from other sources and is branded to CAO membership.
- *CAO Congress* – the cost to attend the CAO Biennial Congress is largely subsidized by industry sponsorship and the OPTOFAIR. Member registration fees have been the same for the past 8 years.
- *Discount programs* – CAO members are eligible for discount programs such as car rentals, frames and insurance. The discounts range from 10-20%.

CAO members provide feedback to the CAO national office when a program or service has resulted in a cost savings. We have not attempted to calculate the definitive value of national services. Ask yourself if you support the need for optometry to have a strong national presence. The direct and indirect benefits are immeasurable. It would appear there is a strong case to be made that the current average per member annual fee is great value.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L'adhésion à un nombre croissant d'associations provinciales devenant volontaire, on s'attend de plus en plus à ce que l'ACO et les associations provinciales montrent quels avantages il y a à être membre. L'ACO a été priée d'envisager la question sous l'angle des coûts de l'adhésion à l'ACO et du « rendement éventuel de l'investissement ». Voici une vue d'ensemble utilisant les questions les plus fréquemment posées à propos des droits que doivent acquitter les membres de l'ACO.

**Q – Combien en coûte-t-il pour être membre de l'ACO?**

La cotisation annuelle de l'ACO est de 330 $ depuis 2004. Chacune des provinces demande aux membres d'approuver une contribution supplémentaire aux frais engagés pour la publicité fixée à l'heure actuelle à 800 $ par membre. Cette contribution est affectée directement au paiement de la publicité télévisée.

**Q – La cotisation et la contribution sont-elles les mêmes dans tous les cas?**

Non. En 1992, toutes les associations provinciales et l'ACO ont convenu d'une formule de financement qui offre une remise à l'Association des optométristes du Québec pour son rôle dans la prestation de services en français. Il s'ensuit que les membres de l'ACO au Québec versent une cotisation nette de 180 $ et que leur contribution à la publicité est de 200 $.

Les membres de l'ACO paient moins cher également si les associations provinciales font bénéficier à certaines catégories de membres des réductions. Dans ce cas, le même pourcentage de réduction est appliqué à la cotisation et à la contribution de l'ACO. Les associations provinciales qui permettent aux membres de payer les droits par carte de crédit peuvent déduire la commission versée par les commerçants qui s'applique aux paiements de l'ACO.

**Q – De quelle façon la cotisation est-elle fixée et perçue?**

Le Conseil de l'ACO fixe la cotisation de l'ACO un exercice financier complet à l'avance afin de permettre aux provinces d'établir leur budget en conséquence. Les provinces perçoivent la cotisation et la remettent à l'ACO. La contribution pour la publicité est recommandée par le Comité national d'éducation publique et est approuvée aux assemblées générales annuelles provinciales.

**Q – Un optométriste peut-il refuser d'adhérer à l'ACO ou en devenir membre directement?**

Non. L'ACO, qui a été formée en 1941, est une fédération des dix associations provinciales. Selon la charte de l'ACO, une personne membre d'une association provinciale est automatiquement membre de l'ACO et une cotisation annuelle est perçue. Un optométriste ne peut choisir de ne pas faire partie de l'association provinciale et de joindre directement l'ACO.

**Q – Comment surveille-t-on l'appartenance à l'ACO?**

L'association provinciale avise l'ACO des changements. Les personnes qui ne sont plus membres d'une association provinciale sont rayées de la base de données de l'ACO.

**Q – Les programmes et les services de l'ACO sont-ils réservés aux membres?**

Oui. L'ACO applique une politique rigoureuse, selon laquelle ses programmes et services ne sont offerts qu'à ses membres. Cette politique s'applique à tous les programmes y compris le Congrès biennal de l'ACO.

**Q – L'ACO a-t-elle besoin des cotisations des membres pour ses activités?**

Les cotisations des membres sont très importantes pour les activités de l'ACO. Au cours des dernières années, les sources de revenus hors cotisations de

l'ACO ont augmenté, ce qui lui permet d'offrir plus de services à ses membres sans accroître les cotisations.

**Q – A-t-on demandé aux membres de l'ACO s'ils étaient satisfaits des cotisations de l'ACO?**

Oui. En 2007, une enquête sur la satisfaction des membres de l'ACO a révélé que le plus fort pourcentage de membres considérait les cotisations de l'ACO comme raisonnables. Un résultat similaire avait été obtenu en 2003. Le degré de satisfaction était encore plus élevé pour la contribution de 800 $ à la publicité. L'enquête sur la satisfaction des membres de l'ACO menée en 2007 a conclu que le taux de satisfaction global à l'égard de l'ACO était de 75 %.

**Q – Y a-t-il des exemples du « rendement de l'investissement » que les programmes et les services de l'ACO offrent aux membres?**

Voici des programmes qui offrent des avantages financiers :

- *Le programme national de publicité* – Pour chaque dollar versé, la valeur de l'achat national se situe en règle générale aux alentours de 1,60 $. Les économies d'échelle et la négociation de publicité télévisée à l'échelle nationale rendent cela possible. Ce degré d'efficacité a été confirmé par un consultant indépendant.
- *Les coûts de marketing* – Les membres de l'ACO savent qu'il faut promouvoir la profession. Ce qui, à l'échelle du cabinet, inclut les inscriptions dans les pages jaunes, la publicité, les affiches et ainsi de suite. La contribution de 800 $ représente une petite portion de ce coût. C'est une manière rentable compte tenu du coût pour accroître le nombre de patients qui s'adressent à des optométristes.
- *L'assurance responsabilité professionnelle* – Des membres de l'ACO mentionnent que l'achat par eux-mêmes d'une police similaire peut coûter de 800 $ à 900 $ de plus par année.
- *Les commissions versées par les commerçants pour les cartes de crédit* – Ce programme peut faire épargner de 2 % à 5 % sur les commissions facturées aux membres de l'ACO par les entreprises de traitement de cartes de crédit.
- *Les publications* – Les membres de l'ACO reçoivent gratuitement les publications de l'ACO.
- *La formation du personnel* – Le cours pour les assistants optométriques représente une excellente valeur par comparaison aux autres cours pour les opticiens et à la formation du secteur privé.
- *Les documents imprimés et en ligne* – Le coût des brochures et des fiches de renseignements de l'ACO est inférieur de 20 % à celui du matériel d'autres sources; ces documents sont de plus adaptés aux membres de l'ACO.
- *Le Congrès de l'ACO* – Le coût de la participation au Congrès biennal de l'ACO est en grande partie subventionné par l'industrie et par l'Optofoire. Les frais d'inscription des membres sont les mêmes depuis huit ans.
- *Les programmes de remise* – Les membres de l'ACO ont accès à des programmes de remise, par exemple pour la location d'autos, les montures et l'assurance. Les rabais sont de l'ordre de 10 % à 20 %.

Posez-vous la question : Pensez-vous qu'il est important et nécessaire que l'optométrie ait une forte présence nationale? Les avantages directs et indirects sont incommensurables. Je dirais qu'il y a bien des raisons de soutenir que la cotisation annuelle moyenne actuelle par membre vous en donne beaucoup pour votre argent.

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** On average.

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

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

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



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# Meeting a new record at the 2009 AAO in Orlando

BY ETTY BITTON, OD, MSc, FAAO and L. GINA SORBARA, OD, MSc, FAAO, DIP C&CL


PHOTO COURTESY OF DR. ETTY BITTON

Montreal optometrist and long time attendees of the AAO, Dr. Fadi Maroun and Dr. Brian Goldberg are surrounded by new graduates from Montreal attending their first AAO meeting.

## École d'optométrie, Université de Montréal

This year's annual meeting of the American Academy of Optometry (AAO) held in Orlando, Florida attracted over 4,500 attendees… achieving a new record attendance! Like all the AAO meetings, numerous lectures, workshops, symposia, scientific presentations allowed for attendees to be updated on the latest clinical and scientific information in the eyecare field. The exhibit hall revealed the latest technological advancements and the latest books to update our libraries. Becoming Fellow of the AAO is a big accomplishment, and one that 164 graduates completed this year, representing well over a dozen countries. Six Canadians were amongst the new fellows, including **Dr. Peter Karwatsky** and **Dr. Valerie Lefebvre** from Quebec. Congratulations to all the new fellows!

The École d'optométrie, Université de Montréal also had a very successful participation at this year's conference, with big honors going to **Dr. Maurice Ptito**, professor and Research Chair at the school. Invited speaker for the Monroe J. Hirsch Research Symposium,

Dr. Maurice Ptito delivering the Monroe J. Hirsch Research Symposium lecture entitled "Brain plasticity: Lessons from the visual system".

Dr. Mark Eger, president of the AAO honors Dr. Jacob Sivak with the prestigious Charles Prentice Medal.

Dr Ptito updated the attendees on part of his research dealing with brain plasticity entitled "Brain plasticity: Lessons from the visual system". **Dr. Langis Michaud** participated in a grand rounds lecture on cornea and contact lenses during the continuing education portion of the meeting entitled "A Unique Case of Corneal Warpage Secondary to Continuous Wear of a Silicone Hydrogel Lens". Several other faculty, clinical faculty, optometry and post-graduate students presented during the scientific paper and poster sessions. (*Table 1*)

Participation was also a new record at this year's meeting, with over fifty attendees from Quebec! Many were first time attendees and they found the experience truly rewarding and extremely valuable, not only for clinical excellence amongst the speakers but also for the valuable networking possibilities that the meeting offers. **Nicolas Tea** (optometry student) and **Walter Wittich** (PhD student), both presenters, were honored with a Student Travel Fellowship to attend the meeting. **Dr. Nathalie Trottier** (contact lens resident) was also awarded a Residency Travel Grant to attend the meeting. **Dr. Jean-Marie Hanssens** (PhD student) received the Carl Zeiss Vision Student Travel Fellowship to attend the next two AAO meetings.

Next year's meeting promises to be just as educational and full of clinically relevant information. It is to be held in San Francisco at the Moscone Center West on November 17-20, 2010! For more information, check out the AAO's website at www.aaopt.org or on its new Facebook page. See you there!

## School of Optometry at the University of Waterloo

The School of Optometry at the University of Waterloo was very proud to see **Dr. Jake Sivak** honoured by the AAO this year with the receipt of the prestigious Charles F. Prentice Medal. The title of the lecture given by the awardee was, "Serendipity in Scientific Research: Examples from Basic and Applied Ocular Lens Research." This fascinating talk brought the audience through the many years of research guided by Dr. Sivak and performed by himself in many areas around the world and by his impressive list of graduate students. (*See photo*)

**Dr. Kristine Dalton** was the recipient of the Sheldon Wechler Contact Lens Residency Award after completing her residency at UW under the supervision of **Dr. L. Sorbara**, in the area of fitting keratoconus patients with large diameter contact lenses.

Finally, the Vistakon Ezell Fellowship Award was presented to Vidhyapriya (Priya) Sreenivasan, for her PhD graduate work in ocular-motor parameters in myopic children, under the supervision of **Drs. Bobier** and **Irving**.

**Dr. Thomas Freddo** gave two well received continuing education lectures, "The Clinical Significance of Conjunctival Lumps, Bumps and Spots" and "A Systemic Disease Approach to the Red Eye: Arthropathy vs Arthritis". **Dr. Lyndon Jones** participated in a round table presentation/discussion on, "Solution induced corneal staining – clinically relevant or not?", with other well known speakers.

Many of our faculty representing our School of Optometry and Centre for Contact Lens Research, undergraduate and graduate students participated in paper and poster presentations that are listed in *Table 2*.

## TABLE 1: École d'optométrie, Université de Montréal participation in the 2009 Annual AAO Meeting, Orlando, Florida

| FACULTY | AUTHOR | TITLE OF PRESENTATION |
|---|---|---|
| | Michaud L, Beaulieu M, Gravel K | Clinical performance of senofilcon A lenses compared with Omafilcon A to reduce induced ocular dryness (poster) |
| | Michaud L, Fortin M, Tessier E | Visual impact of "Freshlook ColorBlends" corneal lenses (poster) |
| | Michaud L, Magnan ME, Lavoie C | Comparative results of monovision vs multifocal fitting on a presbyopic population using Purevision and Purevision multifocal lenses (poster) |
| | Michaud L | Cornea and Contact Lens Grand Rounds<br>A Unique Case of Corneal Warpage Secondary to Continuous Wear of a Silicone Hydrogel Lens (lecture) |
| | Karwatsky P | Chalazion-Induced Hyperopia (poster) |
| | Lovasik JV, Kergoat H, Gauthier C, Dion I | Regulation of choroidal blood flow fails during cold stimulation (poster) |
| | Kergoat H, Lovasik JV, Boutin T, Kergoat MJ, Racine N, Parent M | Retinal and macular vessels in the healthy aging eye (paper) |
| | Marinier JA, Fraser A | Exudative ARMD patients successfully treated with anti_VGEF médications : A new clinical challenge for low vision optometrists (poster) |
| | Ptito M | Brain plasticity: Lessons from the visual system (Monroe J. Hirsch Research Symposium, invited speaker) |
| STUDENTS | | |
| Optometry students | | |
| | Gemme C, St-Jean A, Bitton E, Jones D | Institutional and gender differences in student indebtedness attending Canadian optometry schools (poster) |
| | Tea N, Argaw A, Duff G, Ptito M, Bouchard J-F | The endocannabinoid system modulates the development of the optic nerve (paper) |
| Graduate Students | | |
| | Hanssens JM, Moulin M, Allard R, Faubert J | Does aging influence postural reactivity generated by stimulated ophthalmic lenses distortions? (poster) |
| | Wittich W, Dubuc S, Watanabe DH, Overbury O | Item difficulty of the Montreal cognitive assessment in patients with visual impairment (paper) |

## TABLE 2: School of Optometry at the University of Waterloo participation in the 2009 Annual AAO Meeting, Orlando, Florida

| AAO 2009 ORLANDO | AUTHORS | TYPE |
|---|---|---|
| Charles F. Prentice Medal Lecture Awardee: Serendipity in Scientic Research: Examples from Basic and Applied Ocular Lens Research | Sivak J | Award Lecture |
| Sheldon Wechler Contact Lens Residency Award | Dalton, Kristine | Award |
| Vistakon Ezell Fellow | Sreenivasan, Vidhyapriya (Priya) | Award |
| Clinical Significance of Conjunctival Lumps, Bumps and Spots | Freddo T | CE |
| A Systemic Disease Approach to the Red Eye: Arthropathy vs. Arthritis | Freddo T | CE |
| Solution induced corneal staining - clinically relevant or not? | Jones L, Young G, Morgan P, Papas E, Nichols J | CE |
| Patient and practitioner compliance with silicone hydrogel and daily disposable lens replacement in USA and Canada | Dumbleton K, Richter D, Woods C, Jones L, Fonn D | Paper |
| The role of compliance with replacement frequency of silicone hydrogel lenses on subjective comfort and vision | Dumbleton K, Woods C, Jones L, Fonn D | Paper |
| Distribution of overnight central corneal swelling with high powered silicone hydrogel lenses | Moezzi A, Fonn D, Varikooty J, Richter D | Paper |
| Visual field loss, attention and mobility | Leat SJ, Mittelstaedt A, Machan CM, Hrynchak PK, Irving EL | Paper |
| Prescribing for hyperopia and the presence of symptoms in children in a University-based optometry clinic | Leat SJ, Mittelstaedt A, Machan CM, Hrynchak PK, Irving EL | Paper |
| The Impact Of Rub & No-Rub Care Products On Protein Removal And Localization | Luensmann D, Miriam H, Liu L, Sheardown S, Jones LW | Paper |
| Patient and practitioner compliance with silicone hydrogel and daily disposable lens replacement in USA and Canada | Dumbleton K, Richter D, Woods C, Jones L, Fonn D | Paper |
| The role of compliance with replacement frequency of silicone hydrogel lenses on subjective comfort and vision | Dumbleton K, Woods C, Jones L, Fonn D | Paper |
| Bacterial adhesion to lactoferrin-coated conventional and silicone hydrogel contact lens materials | Subbaraman LN, Jones L, Borazjani R, Zhao Z, Zhu H, Willcox MDP | Paper |
| Utility of a contact lens case pulsator to aid lysozyme removal from etafilcon A hydrogel lenses soaked in a no rub MPS regimen | Jones L, Joyce E, Heynen M | Paper |
| Smoking cessation referrals by optometrists: A pilot study assessing practices and opportunities | Spafford MM, Kennedy RD, Schultz A, Iley M | Paper |
| The Transient Nature of Solution-Induced Corneal Staining | Peterson R, Gorbet M, Woods C, Fonn D | Paper |
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| AAO 2009 ORLANDO | AUTHORS | TYPE |
|---|---|---|
| Repeatability of pachymetry measures by the RTVue-100 spectral domain optical coherence tomographer | Keech A, Simpson TL, Flanagan J, Jones L | Poster |
| What went wrong? The limit of tolerance to spectacle prescription error | Hrynchak P, Irving EL | Poster |
| Institutional and Gender Differences in Student Indebtedness Attending Canadian Optometry Schools | Gemme C, St-Jean A, Bitton E, Jones DA | Poster |
| The optimum color vision test battery in predicting VDT color identification | Ramaswamy S, Hovis JK | Poster |
| Monochromatic aberrations & progressive addition lens satisfaction in healthy presbyopes | Peer J, Chou R, Hutchings N | Poster |
| In vitro wettability of surface modified and non-surface modified silicone hydrogel contact lens materials | Subbaraman LN, Jones L | Poster |
| Optimising fluorescein observations of solution induced corneal staining | Peterson R, Schneider S, Woods C, Jones L, Fonn D | Poster |
| Impact of protein, lipid and lens polymer on neutralization times of hydrogen peroxide care regimens | Ngo W, Heynen M, Joyce E, Jones L | Poster |
| Tear film deposition on silicone hydrogel contact lenses disinfected with hydrogen peroxide and rub or enhanced no-rub care regimens | Jones L, Heynen M, Joyce E, Lorentz H, Dumbleton K, Varikooty J, Woods C | Poster |
| Grading Bulbar Redness using Cross-calibrated Clinical Grading Scales | Schulze M, Hutchings N, Simpson T | Poster |
| Comparative assessment of visual experience with freeform traditional progressive addition lenses | Chou BR, Hutchings N, Peer J, Buttle A, Despres M, D'Silva S, Smith M | Poster |
| Metrics of the average cornea: anterior segment imaging using the Visante optical coherence tomographer | Maram J, Sorbara L, Simpson T, Fonn D | Poster |
| Anterior Segment Optical Coherence Tomography: Non-contact high and ultra high resolution imaging of contact lens edge profiles | Maram J, Sorbara L, Simpson T, Bizheva K | Poster |
| Hyper-reflective cells observed by confocal microscopy with staining caused by different lens-solution combinations | Schneider S, Woods C, Fonn D | Poster |
| Discrimination thresholds of the central cornea in lens and non lens wearers | Basuthkar Sundar Rao S, Simpson T | Poster |

# SASKATCHEWAN IN PICTURES 100TH ANNIVERSARY

The Saskatchewan Association of Optometrists hosted their 100th Anniversary celebration at the Delta Regina Hotel on November 6th & 7th where they welcomed over 200 attendees. Current members, past members, CAO council members and many special guests and friends attended the Friday afternoon Annual Exhibitors Show followed by an evening walk down memory lane.

The weekend wrapped up with the President's Grand Banquet and an enjoyable time was had by all guests. Dr. Len Koltun was recognized with the prestigious President's Award and also recognized was Dr. James Krueger as the Optometrist of the Year recipient. A new President was designated as Dr. Mike York replaces Dr. Lee Kolbenson in the Presidential Chair and eight of the twelve new SAO members were recognized.

Thank you to everyone for celebrating this commemorative milestone with the Saskatchewan Association of Optometrists.

Dr. Hugh MacKenzie (and Lois), Dr. Lil Linton, Dr Kirsten North and Dr. Jack Huber (and Alice)

Past Presidents of SAO — Front Row: Dr. Hugh MacKenzie, Dr. Jack Huber, Dr. Gerald Rooney, Dr. David Holmes
Back Row: Dr. Russ Schultz, Dr. Robert Degelman, Dr. James Krueger, Dr. Robert Gulka, Dr. Jerome Breker, Dr. Claude Hutton, Dr. Robert Neumann, Dr. James Kerr, Dr. Len Koltun, Dr. Barry Thienes, Dr. Larry Selvig, Dr. Bruce Robinson, Dr. Ronald Gaucher, Dr. James Ross, Dr. Dorothy Barrie, Dr. Leland Kolbenson

President's Award Recipient,
Dr. Len Koltun and SAO President,
Dr. Lee Kolbenson

Dr. James Kerr (and Anita), SAO and
CAO Past President

Dr. Lee Kolbenson (and Margaret),
SAO Past President

SAO New Optometrists 2009 – Front row: Chris Strelioff (Registrar) Tricia Holliday, Joanna Keall, Sonya Hung; Back row: Lonnie Brooks, Graham Noseworthy, Kirk Ewen, Heath Holliday, Michael Langenberger; Absent: Skylar Feltis, Harjit Gill, Jaelyn McComas, Sarah Sliva

Dr. Michael York, SAO President and
Dr. Lee Kolbenson, SAO Past President

Optometrist of the Year Recipient, Dr. James Krueger and SAO President, Dr. Lee Kolbenson

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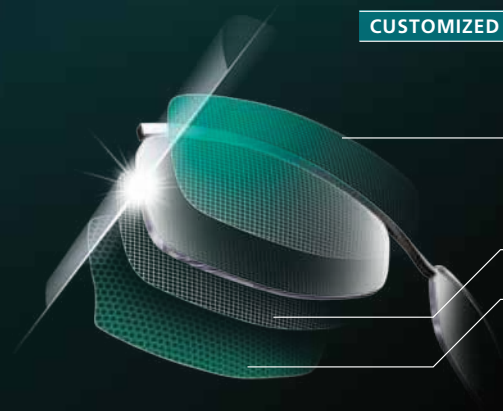

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# Eye Health Month 2009
## WRAP-UP REPORT


As daily digital screen time increases, so does the risk of eye and vision ailments, including computer vision syndrome (CVS). *Canadians & Screen Time – Be Kind to Your Eyes*, the theme of the 2009 Eye Health Month campaign, captured the media and public's attention, with pick-up on stories outlasting Eye Health Month, spilling into November and beyond.

The 2009 campaign, conducted by Fleishman-Hillard, had multiple objectives. Enhancing the profile of Eye Health Month in October, building on past Eye Health Month campaigns and promoting optometrists as the "go to" health care practitioners for eye and vision health, as well as emphasizing the importance of routine comprehensive eye exams have been ongoing strategies of the public awareness campaign.

This year, results from a survey of Canadian optometrists, and a survey conducted by Leger Marketing, were used to raise awareness of computer vision syndrome, particularly among Canada's baby boomer population.

Results of the Leger Marketing survey indicated that female baby boomers are the group at greatest risk of developing computer vision syndrome. Female baby boomers are reporting more eye and vision ailments associated with high screen time than male baby boomers. A concise version of the Leger Survey is posted on the Eye Health Month page at **opto.ca**.

Several different tactics were executed during Eye Health Month to achieve campaign objectives. Three different matte stories, were developed and distributed throughout Canada, that highlighted female baby boomers, computer vision syndrome, and overall eye health.

Audio and video new releases were distributed to traditional media outlets across Canada and online to popular websites, that either focused on the Canadian baby boomer population, or on health related subjects.

*Be Kind To Your Eyes*, highlighting computer vision syndrome, and *Eye and Vision Health for Your Kids* were two online videos that were specifically created for the web and placed on YouTube and other sites.

In addition, several message review sessions were conducted with optometrists who acted as spokespeople from across Canada to ensure consistent and on target messaging. The media release was distributed on national newswire in Vancouver, Calgary, Edmonton, Winnipeg, Saskatoon, Toronto, Ottawa and Halifax.

A separate pitch was developed specifically for blogger outreach.

Results from the campaign were very impressive in 2009, with 108,016,266 million media impressions achieved – a huge jump from the 15 million impressions in 2008. Coverage of the eye health message was strong across all forms of media, from print to television to online sources. Media is generally skeptical about picking up stories on health. Fleishman-Hillard expected four print stories and instead got pick-up on 21 print stories. "There was a huge appetite for this year's Eye Health Month theme of computer vision syndrome", said Lauren Bondar, the consultant at Fleishman-Hillard. Fleishman-Hillard attributes the pick up to the CVS theme, but also to the fact that our spokespeople were fantastic. They made themselves available, they were strongly credible and on target with the message.

### THANK YOU TO THE MEDIA SPOKESPEOPLE

The following CAO members volunteered to be media spokespeople during Eye Health Month and participated in media training to prepare for the campaign.

**Nova Scotia**
Dr. Carol Doman
Dr. Allison Scott

**New Brunswick**
Dr. Lillian Linton

**PEI**
Dr. Susan Judson
Dr. Bonnie Gallant

**Quebec**
Dr. Langis Michaud

**Ontario**
Dr. Mira Acs
Dr. Joseph Chan
Dr. Thomas Noël
Dr. Kirsten North

**Saskatchewan**
Dr. Leland Kolbenson

**Manitoba**
Dr. Scott Mundle
Dr. Don Williamson

**Alberta**
Dr. Diana Monea
Dr. Riaz Ahmed
Dr. Neepun Sharma
Dr. Kim Bugera

**Vancouver**
Dr. Antoinette Dumalo
Dr. Michael Kellam
Dr. Manbir Randhawa

FLEISHMAN-HILLARD ATTRIBUTES THE PICK UP TO THE CVS THEME, BUT ALSO TO THE FACT THAT OUR SPOKESPEOPLE WERE FANTASTIC. THEY MADE THEMSELVES AVAILABLE, THEY WERE STRONGLY CREDIBLE AND ON TARGET WITH THE MESSAGE.

Eleven billboards graced Winnipeg during Eye Health Month.


Dr. Mel Soicher's reception area.

## CAMPAIGN RESULTS

- 108,016,266 million impressions achieved
- Strong mainstream and online media coverage
- Success across all forums with media interviews secured with Tier 1 outlets including – CityTV Toronto, Canada AM, Vancouver Sun, Global News and Best Health Magazine.
- Community coverage across Canada of the matte stories, ANR and VNR
- Online video pick-up on popular web-sites including Rogers Videos, AOL Videos and AOL Canada
- Prominent display on YouTube
- Strong delivery of messaging
- Strong spokesperson roster
- Cost per contact: $0.001

## BREAKDOWN OF CAMPAIGN RESULTS

- **Matte Stories**
  - 8 hits - Three matte stories
  - 1,597,374 – TOTAL IMPRESSIONS
- **Traditional Media**
  - 21 Print Stories
  - 18 Online News Stories
  - 38 Television Stories
  - 34 Radio Stories
  - 2 Magazine Stories
  - 17,359,056 – TOTAL IMPRESSIONS
- **Online Video Coverage**
  - 29 websites hosting VNR
  - 15 websites hosting online videos
  - 89,059,836 – TOTAL IMPRESSIONS

## EYE DARE YOU – 2009 Winners

Spokespeople across Canada did a bang-up job participating in interviews that were picked up the media across Canada. Their names were entered in the *Eye Dare You* contest. In addition, fellow optometrists who entered *Eye Dare You*, creatively came up with other ways of promoting awareness of eye health at the local level during October.

Posters, newspaper ads, and outdoor billboards using the Eye Health Month theme or the *Inside Out* campaign were downloaded, printed and purchased or used by provincial associations, and clinics. An article on children and Computer Vision Syndrome (CVS) was submitted to and printed by *Winnipeg Parent Magazine*. Not all endeavors focused on the theme of CVS. Some tied in their efforts with Kids' Health Day, and others with World Site Day by offering free eye exams that day. Presentations were given at seniors' residences, schools, a women's networking meeting, a Chambers of Commerce meeting, a Rotary Club Banquet, and to a diabetes group. A four hour training session was given to final year medical students during rotation at the Fort St. John Hospital. A preschool toured an optometrist's office. A "thoroughly disgusting" talk on eye disease and assistance with eyeball dissection was given to a grade eight class, and a lecture was given to the Illumination Engineering Society. Pacific Eye Doctors Dunbar partnered with a local grocery store, placed signs near various food items, like spinach, that listed the nutritive benefits of the food item to macular health, and then distributed handouts at the checkout counter. In one clinic a draw was held for a prize of sunglasses.

Incentives were offered by another clinic through the creation of a Facebook site where fans were rewarded with a 10% discount on their next purchase of glasses or contacts if they could name the closest intersection where they saw an *Inside Out* campaign billboard.

These are just a few examples of the wonderful energy that went out to promote optometry.

Congratulations to this year's winner, **Dr. Michelle Georgi** of Village Optical. She won $500.

**NBAO** won this year for promoted more activity, in conjunction with Eye Health Month, than any other province.

# Thank you to our 2009 EYE HEALTH COUNCIL OF CANADA partners

Our Eye Health Council of Canada (EHCC) industry partners play an important role in providing support to the national public awareness program. The goal of the public education program is to establish the importance of preventive eye care — making regular eye exams as automatic to Canadians as other routine health care. Funding from our EHCC partners is used to pay for production of the television campaign ads, research, and the annual Eye Health Month campaign.

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# Le retard de maturation visuelle; un cas clinique

PAR MARIE-EVE CORBEIL, OD, MSc


## RÉSUMÉ

Lors de son premier examen visuel complet, le patient de deux mois et demi ne fixe pas et ne suit pas la cible ou la lumière présentée et ce, malgré un examen visuel normal. Cette condition temporaire est appelée retard de maturation visuelle.

**CONCLUSION :** À cinq mois et demi, le comportement visuel de l'enfant s'est normalisé. Le retard de maturation visuelle est un diagnostic d'exclusion qui nécessite un examen oculo-visuel complet, des tests électrodiagnostiques et si requis, d'imagerie par résonance magnétique.


## Introduction

La suspicion d'une vision anormale chez un nouveau-né doit être prise très au sérieux. En effet, dans 80 % des cas, le professionnel découvre à l'examen une cause évidente de déficit visuel comme une cataracte, du glaucome ou de l'albinisme.[1] Parfois, comme dans l'amaurose congénitale de Leber, il s'agit plutôt de signes sur la rétine, d'anomalies pupillaires ou de nystagmus. D'autres anomalies, comme la cécité corticale, sont accompagnées de troubles neurologiques importants. Par contre s'il s'agit d'un simple retard dans la maturation visuelle, tous les tests objectifs peuvent être normaux, ce qui complique le diagnostic. Les tests électrodiagnostics sont alors très utiles pour faire le diagnostic différentiel entre les différentes conditions et orienter les parents sur l'aspect permanent ou temporaire de la basse vision.

## Exposé de cas

A.J., un garçon de deux mois et demi, est amené par sa mère pour un examen visuel complet. Cette dernière a remarqué qu'A.J. semble avoir un problème de vision puisqu'il ne réagit pas aux stimuli visuels. Il répond par un sourire aux voix humaines, mais ne réagit pas aux visages. L'histoire d'A.J. est sans autre particularité : grossesse à terme sans complication, bonne santé, pas d'antécédent familial de problème systémique ou oculaire. À l'examen, l'acuité visuelle par regard préférentiel, l'habileté à regarder et à suivre une lumière ou un gros objet, la présence ou l'absence de nystagmus, les réflexes pupillaires, l'examen externe, le fond d'œil à l'ophtalmoscopie directe et indirecte et la réfraction sous cycloplégie sont évalués (*tableau 1*). Aucune anomalie particulière n'a été détectée.

Compte tenu du jeune âge du patient et de l'absence de pathologie oculaire visible, un suivi dans un mois et demi est alors recommandé. Lors de ce suivi, les mêmes résultats sont trouvés à l'examen.

Quel est le diagnostic le plus probable?

TABLEAU 1 : Tests et résultats de l'examen visuel d'A.J.

| Tests | Résultats |
|---|---|
| Acuité visuelle (Carte de Teller) | Nil |
| Fixation | Absente |
| Motilités | Nil |
| Nystagmus | Absent |
| Réflexes pupillaires | Normaux |
| Examen externe | Normal |
| Fond d'œil | NO, rétine et macula normaux |
| Réfraction (rétinoscopie sous cycloplégie) | OD +1,25/-0,50 x 180<br>OS +1,50 |

## Discussion

Un enfant présentant un retard de maturation visuelle (RMV) ne fixe pas ou ne suit pas une cible ou une lumière et ce, malgré un examen visuel qui peut être entièrement normal. Dans la plupart des cas, il ne clignera pas à l'approche d'une lumière forte ou d'un objet. Normalement, le réflexe de fixation peut être observé chez l'enfant dès 32 semaines de gestation.[2,3] À cet âge, le regard préférentiel est aussi présent.[4] En effet, les nouveau-nés vont préférer regarder un patron ou une cible en mouvement plutôt qu'une plage uniforme. Les poursuites horizontales sont présentes dès la naissance, mais les poursuites verticales se développent entre quatre à six semaines d'âge. Typiquement, les patients atteints de RMV ont entre deux et quatre mois et sont en bonne santé. Ils vont généralement commencer à fixer et à suivre les objets vers l'âge de six mois. Le RMV n'est pas une condition nouvelle. Déjà, en 1926, Beauvieux décrivait des enfants réagissant peu ou pas aux stimuli visuels à la naissance.[5] Depuis, plusieurs auteurs ont décrit des cas similaires en utilisant différents termes : *myelogenosis retardata*, *développement visuel dissocié* ou *délai de développement visuel* .[6,7] Illingworth (1961) serait le premier à avoir introduit le terme retard de maturation visuelle. Il a décrit la condition de deux bébés, sans aucun retard développemental, dont la réaction normale aux stimuli visuels ne s'est pas manifestée avant l'âge de six mois.[8] En 1981, Uemera et al. ont présenté une classification des RMV comprenant trois catégories (*tableau 2*).[9] Fielder et al. ont modifié cette classification en proposant plutôt quatre types avec sous catégories (*tableau 3*).[10]

### TABLEAU 2 : Types de RMV[9]

| Types | Caractéristiques |
|---|---|
| 1 | RMV isolé |
| 2 | RMV et retard mental ou épilepsie |
| 3 | RMV et anomalies visuelles primaires |

### TABLEAU 3 : Types de RMV[10]

| Types | Caractéristiques | | |
|---|---|---|---|
| 1 | RMV est l'anomalie principale | 1a | Période périnatale normale |
| | | 1b | Période périnatale anormale |
| 2 | RMV et trouble de développement neurologique durable | | |
| 3 | RMV, nystagmus et albinisme | | |
| 4 | RMV et troubles oculaires congénitaux bilatéraux | | |

Le RMV est un diagnostic d'exclusion qui nécessite un examen oculo-visuel complet, des tests électrodiagnostiques et éventuellement d'imagerie par résonance magnétique (IRM). Le recours aux potentiels évoqués visuels (PEV) est fréquent. Les résultats sont toutefois très variables d'une étude à l'autre. Certaines études ont rapporté que les enfants avec RMV montraient aussi une atteinte initiale des PEV. Les PEV *flash* peuvent être absents[7], montrer une latence[11] ou une forme anormale[10] dans les premiers mois de vie avec une amélioration progressive par la suite. Les PEV *pattern* montrent des similitudes, mais varient beaucoup en fonction du stimulus utilisé. L'électrorétinogramme (ERG) est anormal seulement si le RMV est associé à des anomalies rétiniennes.[12] Les principaux diagnostics différentiels sont présentés au tableau 4. Toutes ces conditions présentent un tableau clinique initial comparable. Les deux conditions les plus difficiles à éliminer sont l'hypoplasie papillaire bilatérale et la cécité corticale. Dans le premier cas, l'aspect symétrique des nerfs optiques peut faire passer l'atteinte inaperçue; le diagnostic de la seconde condition qui n'est pas toujours facile à éliminer en jeune âge nécessite souvent une IRM.

Le pronostic des enfants ayant un retard de la maturation visuelle est très variable d'une étude à l'autre et dépend beaucoup du type d'atteinte. Plusieurs auteurs rapportent des cas de RMV isolés[7, 11, 13] tandis que d'autres les retrouvent associés avec d'autres troubles neurologiques.[1] Les cas isolés vont se normaliser en moyenne vers la 14e semaine selon Fielder[10] et entre trois et huit mois selon la majorité des auteurs.[12, 14, 15] Cette

TABLEAU 4 : Principaux diagnostics différentiels

| Conditions | Caractéristiques |
|---|---|
| Amaurose congénitale de Leber | Nystagmus fréquent<br>Anomalie papillaire<br>Variation rétinienne<br>Altération majeure de l'ERG<br>Déficit total ou important des PEV |
| Albinisme | Nystagmus possible<br>Fond d'œil peu pigmenté<br>ERG et PEV normaux<br>Transillumination irienne permet le diagnostic |
| Dystrophie des cônes | Altération majeure de l'ERG<br>Atteinte des PEV<br>Nystagmus et photophobie précoces |
| Hypoplasie papillaire bilatérale | ERG normal<br>PEV +/- atteints<br>**Tomodensitométrie permet le diagnostic** |
| Cécité corticale | ERG normal<br>Déficit important des PEV<br>**IRM permet le diagnostic** |

guérison est rapide. En quelques jours l'enfant s'éveille, s'intéresse et sourit à son entourage. L'examen visuel complet devient alors comparable à celui des autres enfants normaux du même âge. Lorsque le RMV est associé à un retard mental (type 2 selon Fielder), le pronostic est moins bon à cause des anomalies neurologiques associées. Lorsque le RMV est associé à une autre anomalie oculaire comme l'albinisme, l'aniridie ou autre (type 3 et 4 selon Fielder), la vision initiale paraît totalement absente ou plus basse que ce que l'anomalie oculaire trouvée laisse supposer. Cependant, en quelques mois, en moyenne cinq mois, une certaine vision apparaît, correspondant à celle que l'on était en droit d'espérer avec l'anomalie associée.[10]

Plusieurs hypothèses ont été émises dans le passé pour déterminer la cause du RMV. Selon Beauvieux, il était causé par un retard de myélinisation.[5] Pendant longtemps, les voies visuelles antérieures étaient considérées comme complètement myélinisées dans les premiers mois de vie.[16] Des études plus récentes montrent que les fibres du nerf otique commencent leur myélinisation à la naissance, mais que le processus peut se poursuivre jusqu'à l'âge de deux ans.[17]

Selon Hoyt, le RMV était plutôt causé par un retard de maturation de certaines fonctions corticales[18], tandis que Tresidder croit à une anomalie du système extra géniculé prédominant dans les deux premiers mois de la vie tandis que les fonctions purement corticales émergent normalement après ce délai.[19]

## Conclusion

À l'âge de cinq mois et demi, A.J. est examiné de nouveau. Il présente un comportement visuel à l'intérieur des limites de la normale pour un enfant de son âge. La mère a remarqué qu'il réagit normalement aux stimuli visuels.

Le RMV est une condition visuelle relativement rare dans laquelle l'enfant ne réagit pas à des stimuli visuels, mais ne présente aucune anomalie visible. Le RMV peut se retrouver de façon isolée ou accompagner d'autres anomalies. Dans la majorité des cas, le comportement visuel redevient normal vers l'âge de six mois. Après cet âge, ou si les parents sont inquiets, il est recommandé de faire passer des tests électrodiagnostics (PEV et ERG) pour éliminer toute autre cause de déficit visuel.

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# Delayed Visual Maturation – A Clinical Case

BY MARIE-EVE CORBEIL, OD, MSc


## SUMMARY

A first eye examination is performed on a two and a half month old patient who presents with no visual response to fixation or to pursuing a target or a light despite an unremarkable ocular health assessment. This temporary eye condition is known as Delayed Visual Maturation (DVM).

**CONCLUSION:** A subsequent eye examination was performed at age five and a half months only to reveal that the child's visual behaviour was now considered to be appropriate for his age. The diagnosis of DVM remains a diagnosis of exclusion and requires a comprehensive eye examination, electrodiagnostic testing and imaging techniques which may eventually include MRI.


## Introduction

Suspected abnormal vision in a newborn should not be taken too seriously. In fact, in 80% of cases, the professional discovers, upon examination, an obvious cause of visual impairment such as a cataract, glaucoma or albinism.[1] Sometimes, as with Leber congenital amaurosis, it is instead marks on the retina, pupil anomalies or nystagmus. Other anomalies, such as cortical blindness, are accompanied by major neurological disorders. However, if it is simply delayed visual maturation, all the objective tests may be normal, which complicates the diagnosis. Electrodiagnostic testing then becomes very helpful for making a differential diagnosis between the various conditions and guiding the parents regarding the permanent or temporary aspect of the reduced vision.

## Case report

A.J., a boy at two-and-a-half months of age, is brought in by his mother for a comprehensive eye examination. She noticed that A.J. seems to have a vision problem because he does not react to visual stimuli. He smiles when he hears human voices, but does not react to faces. A.J.'s history is otherwise unremarkable: term pregnancy with no complications, good health, no family history of systemic or eye problems. Upon examination, visual acuity via preferential looking, the ability to look at and track a light or large object, the presence or absence of nystagmus, pupillary reflexes, external examination, the ocular fundus by direct and indirect ophthalmoscopy and retinoscopy under cycloplegia are assessed (*table 1*). No particular anomalies were detected.

Given the young age of the patient and the absence of any visible ocular pathology, a follow-up in one-and-a-half months was then recommended. At that follow-up, the same results were obtained upon examination.

What is the most likely diagnosis?

## Discussion

An infant with delayed visual maturation (DVM) does not fix or follow a target or light, despite an eye exam that may be completely normal. In most cases, the infant does not blink at the approach of a bright light or object. Normally, the fixation reflex may be seen in the infant at 32 weeks gestation.[2,3] At that age, preferential looking is also present.[4] In fact, newborns will prefer to look at a pattern or moving target rather than a uniform surface. Horizontal

### TABLE 1: Tests and Results of A.J.'s Eye Exam

| Tests | Results |
|---|---|
| Visual acuity (Teller card) | Nil |
| Fixation | Absent |
| Motility | Nil |
| Nystagmus | Absent |
| Pupillary reflexes | Normal |
| External exam | Normal |
| Ocular fundus | NO, normal retina and macula |
| Refraction (retinoscopy under cycloplegia) | OD +1.25/-0.50 x 180<br>OS +1.50 |

## TABLE 2: Types DVM[9]

| Types | Characteristics |
|---|---|
| 1 | Isolated DVM |
| 2 | DVM and mental retardation or epilepsy |
| 3 | DVM and primary visual anomalies |

## TABLE 3: Types of DVM[10]

| Types | Characteristics | | |
|---|---|---|---|
| 1 | DVM is the primary anomaly | 1a | Normal perinatal period |
| | | 1b | Abnormal perinatal period |
| 2 | DVM and lasting neurological development disorder | | |
| 3 | DVM, nystagmus and albinism | | |
| 4 | DVM and bilateral congenital eye disorders | | |

tracking is present at birth, but vertical tracking develops between four and six weeks of age. Patients with DVM are typically between two and four months old and are in good health. They generally start to fix and follow objects at around six months of age. DVM is not a new condition. As early as 1926, Beauvieux was describing infants who showed little or no reaction to visual stimuli at birth.[5] Since then, a number of authors have described similar cases using different terms: *myelogenosis retardata* , *disscociated visual development* or *delayed visual development*.[6,7] Illingworth (1961) was the first to introduce the term delayed visual maturation. He described the condition of two infants, with no developmental delay, whose normal reaction to visual stimuli did not appear until six months of age.[8] En 1981, Uemera et al. introduced a DVM classification having three categories (*table 2*).[9] Fielder et al. altered that classification by instead suggesting four types with subcategories (*table 3*).[10]

DVM is an exclusion diagnosis requiring a comprehensive eye exam, electrodiagnostic testing and potentially magnetic resonance imaging (MRI). The use of visual evoked potentials (VEP) is common. However, the results vary considerably from one study to the next. Some studies have reported that infants with DVM also show an initial VEP deficit. *Flash* VEPs may be absent[7], show latency[11] or an abnormal shape[10] in the first months of life with gradual improvement after that. *Pattern* VEPs show similarities, but vary greatly depending on the stimulus used. The electroretinogram (ERG) is abnormal only if the DVM is associated with retinal anomalies.[12] The main differential diagnoses are shown in table 4. All these conditions have a comparable initial clinical presentation. The two conditions that are the hardest to rule out are bilateral pupillary hypoplasia and cortical blindness. In the first instance, the symmetrical aspect of the optic nerves can result in the pathology going undetected; the diagnosis of the second condition, which is not always easy to rule out at a young age, often requires an MRI.

The prognosis of infants with delayed visual maturation varies considerably from one study to the next and greatly depends on the type of pathology. Several authors report isolated cases of DVM[7, 11, 13] while others find them associated with other neurological disorders.[1] The isolated cases end up correcting themselves on average around the 14th week according to Fielder[10] and between three and eight months according to most of the authors.[12, 14, 15] That recovery is fast. In a few days, the infant wakes, is interested in and smiles at its surroundings. The comprehensive eye exam is then comparable to that of other normal infants of the same age. When DVM is associated with mental retardation (type 2 according to Fielder), the prognosis is not as good because of the associated neurological anomalies. When DVM is associated with another ocular defect such as albinism, aniridia or something else (type 3 and 4 according to Fielder), initial vision seems totally absent or less than what the detected ocular defect suggests. However, in a few months, on average five months, some vision appears, corresponding with what would be expected with the associated anomaly.[10]

A number of hypotheses were put forth in the past for determining the cause of DVM. According to Beauvieux, it was caused by myelination delay.[5] It was long considered that the rear visual pathways were completely myelinated in the first months of life.[16] More recent studies show that the fibres of the optic nerve start myelination at birth, but

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## TABLE 4: Main Differential Diagnoses

| Conditions | Characteristics |
|---|---|
| Leber congenital amaurosis | Frequent nystagmus<br>Pupillary anomaly<br>Retinal variation<br>Major ERG alteration<br>Total or severe VEP deficit |
| Albinism | Possible nystagmus<br>Ocular fundus hypopigmentation<br>Normal ERG and VEP<br>Iris transillumination enables diagnosis |
| Cone dystrophy | Major ERG alteration<br>VEP affected<br>Early nystagmus and photophobia |
| Bilateral pupillary hypoplasia | Normal ERG<br>VEP +/- affected<br>**CAT scan enables diagnosis** |
| Cortical blindness | Normal ERG<br>Major VEP deficit<br>**MRI enables diagnosis** |

that the process may continue until two years of age.[17]

According to Hoyt, however, DVM was caused by a delay in the maturation of certain cortical functions[18], whereas Tresidder believes it is an abnormality in the extrageniculate system predominating in the first two months of life, while the purely cortical functions emerge after that time.[19]

DVM is a relatively rare visual condition where the infant does not react to visual stimuli, but shows no visible anomalies. DVM can be seen isolated or accompanied by other abnormalities. In most cases, visual behaviour becomes normal around six months of age. After that, or if the parents are concerned, electrodiagnostic testing (VEP and ERG) is recommended to rule out any other visual impairment.

## Conclusion

At five-and-a-half months of age, A.J. was examined again. He presented with visual behaviour within the normal limits for an infant of his age. The mother noticed that he reacts normally to visual stimuli.

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