

Contrast Sensitivity Function and Low Vision

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The Canadian Association of Optometrists through its educational endowment fund recently provided the funds for a custom designed contrast sensitivity function unit at the low vision clinic of the University of Waterloo. Its purpose is to enhance the capability of low vision clinicians to evaluate residual functional vision of some low vision patients where conventional visual acuity approaches fail to quantify any functional loss of vision.

The sine wave contrast sensitivity approach involves measuring the relationships between contrast sensitivity and spatial frequency for gratings which have a sinusoidal luminance profile. Contrast sensitivity is defined as the reciprocal of contrast threshold. It has been very successful in elucidating normal visual function. This approach extends the present letter acuity assessment to accurately assessing the quality of vision for objects which can be seen at a very high contrast. A wide variety of conditions which result in visual impairment can be monitored. The main thrust of the clinical investigation is to quantify loss or improvement of vision.

The new approach of measuring contrast sensitivity for object sizes within the resolution limit offers not only a more complete description of

different types of visual loss but also a more sensitive method and possibly a more realistically correlated perceptual method of assessing the visual advantage of different optical aids, filters or changes in luminances for patients with partial sight. The usefulness of this approach has already been established for description and assessment of low vision patients.^{1,2}

These results add to our present appreciation of the type of vision that a low vision patient experiences and may have an important bearing upon the question of when to refer the patient for medical and/or surgical care. It is suggested that the assessment of the visibility of large objects be used in the clinical environment to supplement the present acuity evaluation of low vision patients. These findings raise the more general question as to how any residual visual function should be assessed for occupational or legal needs. Is the present acuity evaluation and visual field requirement adequate to define "blindness" or partial sightedness? Assessment and specification of the intra-resolution abnormality, combined with an understanding of its suprathreshold consequences, should allow a much more adequate definition of legal blindness. When the visual loss has a purely optical basis as, for example, in cataract, visual assessment should involve measurement of the vis-

ibility of large objects as well as the limit of resolution.

Ophthalmic practitioners have long recognized the need for such a tool. Seasoned practitioners appreciate there is a vast difference in behavior between two low vision patients who have identical Snellen visual acuities. It is understood that identical visual acuities may yield substantially different visual capabilities. One simply cannot predict a low vision patient's contrast sensitivity from his acuity. This method therefore should be used for diagnosis, description and assessment of a number of primary and secondary ocular neurological conditions which are not fully understood because of the traditional limited acuity view towards visual function.

On behalf of our low vision clinic of the School of Optometry, I wish to thank the trustees of the educational endowment fund of the CAO for supplying our clinic with a very valuable tool. The newly created contrast sensitivity service will supplement other already existing diagnostic services such as VER, ERG, laser interferometry and visometry.

References

1. Hess, R. and G. Woo, Vision through cataracts. *Investigative Ophthalmology and Visual Science*, Vol. 17, pp. 428-435, 1978.
2. Woo, G. and C. Dalziel, A pilot study of contrast sensitivity assessment of the CAM treatment of amblyopia. *Acta Ophthalmologica*, Vol. 59, pp. 35-37, 1981.

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comptes 1981 dans ce numéro de la Revue, soumettre à votre considération. Vous pouvez poser quelques questions au directeur exécutif de l'ACO, M. Donald Schaefer.

Résumé

Le conseil et le personnel administratif de l'Association canadienne

d'optométrie considèrent que 1981 constitue une année d'efforts productifs au nom de la profession d'optométriste. Nous vous sommes sincèrement reconnaissants et vous remercions tous, ainsi que les membres de vos exécutifs provinciaux et le personnel de vos associations, pour le soutien financier et opérationnel que vous nous avez prodigué

pendant l'année 1982. Nous espérons poursuivre à développer les points forts de notre organisation, afin de pouvoir assurer que l'optométrie puisse toujours faire face aux défis se posant à la profession. Nous vous remercions pour votre intérêt, et serions heureux de répondre à vos questions ou de recevoir vos commentaires.