# 2020 CAO Clinical Practice Guideline: Optometric Low Vision Rehabilitation Executive Summary

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## PURPOSE

The purpose of the Low Vision Clinical Practice Guideline is to assist Canadian Optometrists in the provision of the best rehabilitative care for patients with low vision. The guideline is based on current available best evidence, interpreted by an expert panel. The writing group includes optometrists from academia and private practice, representing various regions across Canada. The guideline will aid optometrists to identify patients who require low vision rehabilitation and recommends appropriate assessment and management.

## INTRODUCTION

### The Problem

Currently, it is estimated that 0.95% of the Canadian population has visual impairment, including low vision and blindness.[1] The prevalence increases exponentially with age.[2] By the age of 75-84 years the percentage of those with visual impairment is approximately 6-8.9%.[1, 3] The Canadian population is aging;[4] by 2036 it is expected that 23-25% of the population will be comprised of older adults. There will, therefore, be an associated increase in people with visual impairment.[1, 3, 5, 6] It is predicted that the numbers of people with low vision will more than double in the next 30 years.[2] There is an urgent and increasing need for low vision rehabilitation (LVR) to help mitigate the impact of visual impairment.

The impact of visual impairment is wide-ranging and substantial. It is associated with disability (activity limitations) for visually intensive tasks (reading, writing), as well as mobility.[7] There are also deficiencies in performance of daily living tasks, such as personal care, shopping and meal preparation, compared to the general population, as well as compared to those living with other chronic conditions.[7-9] People with visual impairment are less likely to be employed, and have more social isolation and transportation difficulties and more risk of falls. They have higher risk of depression and other mental health difficulties, an overall reduction in quality of life and increased mortality.[8, 10-12]

### Model of Low Vision Rehabilitation

Studies have shown that LVR is effective.[13, 14] This includes LVR for patients with mild vision loss,[15] and LVR provided by optometrists in both community and private practice settings.[15-17] Canadian optometrists are ideally qualified[18] to play a pivotal role in low vision provision, and are instrumental in full multidisciplinary/interdisciplinary settings, providing the initial assessment and interventions, plus devising a rehabilitation plan. Since Canada is large geographically and has sparse populations in rural areas, it is essential for equitable access that optometrists provide a key role in LVR.[19]

**Level 1. LVR**
This guideline adopts a three-tier model of LVR. It states that it is the responsibility and minimum standard of care expected of all optometrists to either directly provide LVR, or refer or recommend for LVR by a low vision optometrist prior to referral to other agencies. This is **Level 1 LVR** and should occur as soon as the patient experiences permanent low vision. LVR should be a parallel process to treatment for the eye condition when it is known that a degree of vision loss is irreversible.

Low vision assessment and rehabilitation should always be recommended for the following:

- A patient who has **low vision** which is defined as a **visual impairment** (measurable loss of vision) resulting in a **visual disability** (difficulty undertaking a task because of poor vision).

- To clarify, this includes all patients who have
  - An incurable disease or injury (ocular or systemic) for which available surgical or medical treatment has been undertaken, considered or is on-going
    **AND**
  - Reduced corrected vision (most commonly impairment of visual acuity, contrast sensitivity, or visual fields) compared to age norms
    **AND**
  - Difficulty with desired visual tasks despite optimum optical correction

- In terms of visual impairment, the levels at which vision loss is **likely** to cause a visual disability are (but not limited to) the following
  - VA 6/12 (20/40) or poorer
    **OR**
  - Central or paracentral scotoma or metamorphopsia
    **OR**
  - Peripheral field loss (hemianopia or quadrantanopia; less than 70 degrees[1] circular diameter total field)
    **OR**
  - Log CS < 1.4

**Minimum additional assessment:** In order to undertake an accurate referral, it is important to ascertain a patient's self-reported disabilities, functional vision and goals. An accurate refraction (ideally with a trial frame) and measurement of best corrected visual acuity are important. All optometrists should be willing and able to trial a higher reading addition (up to 4D). An assessment of contrast sensitivity and visual fields is highly recommended to complete the information required to make an accurate referral.

Beyond this requirement there are two levels at which optometrists may choose to provide LVR.

**Level 2. Basic LVR**
This level of LVR can be provided in an optometrist's office with a modest amount of equipment and optical devices and ideally with the support of a trained optometric technician/assistant or low vision therapist.

Patients who are likely to benefit are those with:

- VA from 6/12 to 6/21 inclusive *and/or* Log contrast sensitivity between 1.40 and 1.00

- No hemianopia or quadrantanopia, and circular visual field larger than 70 degrees

- No significant paracentral field loss which limits reading speed/visual function

**Level 3. Comprehensive LVR**
Patients with vision poorer than listed above for Level 2 Basic LVR are likely to require the full range of optical and electronic devices, and services as described in the Low Vision Clinical Practice Guide,[20] summarised below.

## OPTOMETRIC LOW VISION REHABILITATION

**Low vision rehabilitation** starts with a full low vision assessment/evaluation which includes an extended evaluation of visual function and a review of ocular disease and systemic health conditions that may impact visual function (measured capability of the visual system) and functional vision (ability to undertake vision-related daily life tasks).[21] This results in the creation of an initial Low Vision Rehabilitation plan. Low Vision Rehabilitation management includes the assessment for and training with various optical and/or non-optical low vision aids and/or rehabilitation strategies directed towards the patient's specific needs, as well as supportive patient education and counselling. The result is the final rehabilitation plan, which is the final recommendations for the patient.

### Low Vision Assessment

A comprehensive case history is conducted with emphasis on the patient's self-reported disabilities and goals, including a review of functional domains and covering activities of daily living, vocational/educational/avocational requirements and social activities, which may be impacted by the visual impairment. This is followed by prioritizing the goals with the patient. The case history should also investigate the effectiveness of current spectacles and devices, ocular, general health and family history, medication use, social history, any history of falls, the effects of glare and lighting, the stability of the ocular condition and the patient's own understanding of their ocular condition and its impact.

Trial frame refraction (objective followed by subjective) using lens changes based on the just noticeable difference, is an essential component of a low vision assessment. Often a significant VA improvement can be gained[22, 23] and it is important for the accurate assessment and dispensing of most optical devices that the correct refraction be in place. Habitual and corrected distance visual acuities preferably using visual acuity charts based on logMAR (log of the Minimum Angle of Resolution) principles and designed for low vision[24] and appropriate for the patient's level of vision and age.[24] Near visual acuity should ideally be measured with logMAR continuous text charts, and the viewing distance and threshold M print should be recorded. The impact of lighting on visual acuity should also be considered.

Contrast sensitivity is an important measure to understand a patient's visual function/disabilities and predict outcome with magnification.[25, 26] It is predictive of difficulty with of a wide range of other visual tasks (daily living skills, mobility, face discrimination, driving) and perceived disability.[7, 27-30] Poor CS is a also risk factor for falls.[31, 32] Visual field loss (central or peripheral must be considered and often measured. Additional assessments may be indicated such as colour vision and glare testing, to understand the loss of function due to the patient's ocular disease. Ocular health assessment allows the clinician to evaluate any progress in the disease and the contribution of multiple conditions causing low vision. Dilated fundus examination is not routinely included in a LV assessment as this is usually undertaken prior to the low vision assessment. It may be required, however, in cases where the symptoms, disabilities or other measurements do not align with the current diagnosis, or when there is no recent ocular health examination. Dilated fundus examination will normally require a separate appointment.

At the conclusion of the assessment, the optometrist is able to create a **Low Vision Rehabilitation Plan**. Many components can be implemented by the low vision optometrist, together with his/her optometric assistant. Implementation of the full plan may require referral to other service providers. The rehabilitation plan is revised after exploring and determining the appropriate management (including referrals) for the patient, described below.

### Low Vision Management

The tools at the disposal of the LV clinician include optical, non-optical and electronic magnification, increased contrast, lighting control, minification, relocation of the object or image, training and adaptations. Patient and family education and referrals to other service providers are also important components.

Patients with **central vision loss** may be managed with optical and electronic magnification, as appropriate for distance, intermediate and near tasks. Optical magnification includes high adds and microscopes, hand and stand magnifiers and telemicroscopes for near or intermediate and telescopes for distance tasks. Many optical assistive devices may be customized to account for a patient's refractive error. Electronic magnification and mainstream technology accessibility options should also be considered for many patients. Electronic magnification is effective for patients with contrast sensitivity loss and/or large central scotomas, and includes hand-held, portable and desktop video magnifiers. Patients may often benefit from both optical and electronic magnification. Optical magnifiers tend to be used more frequently and for a variety of tasks while electronic magnification may allow reading for

longer duration, smaller print and be preferred for leisure reading.[33, 34] Accessibility features on current devices (mobile phone, tablet, laptop/desktop computers) includes text to speech, voice assist, talk-back, magnification and contrast/font/colour options.

Although there is limited evidence for the effectiveness of eccentric viewing training (EVT),[35] EVT still retains a place within the range of approaches for patients with central scotomas.

**Reduced contrast sensitivity** is the other main category of vision impairment causing disability alongside central vision impairment (VA loss) and visual field impairment. When CS is reduced to <1.40,[7, 29] the patient is likely to be experiencing some disabilities, such as issues with mobility and resolution tasks, but when CS is <1.00, visual performance is severely compromised, even with appropriate magnification. For example, reading is likely to be slow, even with the use of optical magnifiers.[25, 26, 36]

The approaches for contrast sensitivity loss include a) changing the patient's contrast sensitivity by manipulating the lighting, trialing filters or a typoscope or reversing contrast on electronic magnification or b) increasing the contrast of the task with electronic devices, environmental modifications, and using sight substitution methods e.g., voice output on a computer.

Management for **peripheral vision loss** includes use of prisms for hemianopia (Peli prisms or sector prisms), sector prisms or minifiers for constricted fields, visual search training, strategies to improve visual guidance while reading, and referral for orientation and mobility training.

Patients with **nystagmus** may benefit from yoked prisms and task positioning to enable the comfortable use of their null point. Contact lenses may improve VA for some patients with infantile nystagmus.[37, 38]

**Lighting levels** may significantly improve function for patients with visual impairment and should be explored. Non-selective and selective transmission filters can be of great benefit to many patients with low vision to control light levels and glare, and to optimise patient comfort. Short wave-length yellow tints are often subjectively beneficial to patients, although currently there is no objective evidence that they improve VA, CS or reading for people with visual impairment.[34] Tinted or iris imprint contact lenses may benefit patients with extreme photophobia.

For all devices and rehabilitation recommendations, the selection should involve a patient-centred decision process i.e. the best device for the task(s) as guided by the individual patient.

The optometrist should be able to recommend appropriate non-optical devices, such as large print books, clocks and watches, devices with auditory output, e.g. talking books and blood glucose monitors and tactile approaches such as markings for appliances. Communication and collaboration with other professionals in the rehabilitation team is important for patient success. Optometrists should refer when indicated for other services, such as orientation and mobility training, occupational therapy, low vision therapy, high technology assessments, social and community services, counselling, genetic counseling, vocational counselling, and surgical consultation when appropriate, e.g., for cataract, nystagmus, strabismus. When referring, it is recommended that the optometrist include his/her rehabilitation plan, including what interventions have been explored and implemented.

## CONCLUSION

LVR requires a holistic approach to the patient, and the optometrist must be mindful of the emotional and psychological state of the patient. Interventions that are recommended should not only be task(s) specific, but also patient specific i.e. tailored for each particular patient's goals, requirements and limitations. LVR is an on-going process for most patients and follow-up is important as patients' acceptance level, activities and goals may change over time.

Optometrists are uniquely qualified to provide LVR, as they expertly refract, optimise visual function with spectacles and contact lenses, accurately assess visual function and understand the impact of ocular conditions, develop a vision rehabilitation plan, prescribe optical and non-optical, hand held and spectacle mounted devices, provide vision and assistive device training, advise about visual strategies and environmental modifications and co-ordinate with other services. ●

## ENDNOTE

[1] This includes 60 degrees which is the level for funding in Quebec.

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