

Many faces of Irlen

Many faces of Visual Impairment

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1 Introduction

Many faces of Irlen is the subject of this conference. I have worked for many years with visually impaired people. It means with people between no vision and nearly normal vision.

In Switzerland and other countries, "medical filter glasses" can be prescribed for visually impaired patients. They can be paid by medical insurance. These are a limited selection of colours which are made to a specific transmission by different manufacturers. The patients select the colour they like with a limited assessment. Until training as an Irlen Screener, this was my experience with filter glasses.

Irlen has many faces, visual impairment has many faces, too.

An approach to Irlen syndrome and Low vision at the same time is not easy:

We have to

- evaluate differently
- combine and differentiate at the same time several aspects (size, contrast, light, fatigue etc.)
- understand some principles of Low Vision and Irlen (visual acuity and resolution)
- consider basic effects of filter glasses in general
- to deal in our daily work with not informed medical and psychological personal ("Nothing can be done!" A very common expression used by not informed medical and psychological staff.)

Let me cite Eleonore E. Faye, a well known American Low vision specialist:

"The most important ingredient in helping Low vision patients adjust to and accept limited vision is feelings: the patients's, the clinicians's, and those of the support staff." Eleanor E. Faye, MO Clinical Low Vision, 1984, Little, Brown and Company, Preface XIII

This "ingredient" in helping Low vision patient seems to me a very important aspect for Irlen clients, too. The secondary effects of visual impairment and Irlen Syndrome are to consider as action in every assessment. They can influence screening, diagnosis, acceptance and success of a treatment.

Caring means collaboration with respect for and confidence in the capacity to surmount or compensate for the dysfunction or illness in any possible way. The Low Vision specialist has to be more guide than therapist in

many levels of the rehabilitation process. The attitude in Irlen work should be, in my opinion, similar.

I try to present some basic facts of Low Vision and of Irlen Syndrome, not as a diagnostic puzzles, but as they affect a person's "visual"¹ function.

For a very long time the definition of visual impairment was limited to subnormal visual acuity or a reduced visual field.

Nowadays Low Vision is considered by many specialists in a much larger way. The defect may be in the globe (cornea, iris, lens, vitreous, or retina), the optic pathway or in the visual cortex. If we consider the ocular functions we have to add colour perception, contrast sensitivity, dark adaptation, ocular motility, fusion, poor "convergence power", visual perception, visual awareness and so on.

2 Some Structures and some Functions:

Let us start with a short overview about the visual system.

globe

cornea

iris

lens

vitreous

retina

the optic pathway

the visual cortex

light perception

colour perception

contrast sensitivity

dark adaptation

ocular motility

fusion

"convergence power"

visual perception

visual awareness

3 The field of visual impairment

Therefore, the field of visual impairment is as following:

¹ visual function in a rather large meaning

A disease or accident leading to an irreversible bilateral impairment of visual function in spite of maximum state-of-the-art medical or surgical intervention. The visual acuity cannot be corrected to normal performance levels with conventional spectacles, intraocular or contact lens refraction.

There's a sort of "border-line" between normal and impaired vision. Ophthalmologists often tell the patients: "I can't do any more for you." And they don't refer the patient to a Low Vision specialist. This group could be helped very often by a simple higher addition which allows to read in a nearer distance. For instance: +6.0 in 16 cm allows a 1.5 times magnification by nearer distance.

I am sure, that we can use the same words for Irlen Syndrome. Specialists don't refer patients to go to an Irlen Screener or Irlen diagnostician in order to be helped by Irlen overlays or filters.

4 The Low Vision Patient – The Irlen Patient

4.1 Low Vision Patient

The Low vision patient is a person with an eye disorder whose visual performance is decreased as the consequence of reduced acuity, abnormal visual field, reduced contrast sensitivity, or other ocular dysfunctions (for example: disorders treated by orthoptics) that prevent performance to “full” capacity compared to normal person’s performance.

4.2 Irlen Patient

The Irlen patient is a person with a disorder whose performance is decreased as the consequence of a disorder of light sensitivity, inadequate background accommodation², problem with contrast perception. Problems of glare³ are mentioned in relation to contrast sensitivity.

The background distortion changes the perception of visual stimuli (letters). The white can eat away at the letters. ⁱⁱ

² The background becomes dominant and the letters lose their “information”. To mention is here the “switch effect” of the “vase and the face” “change of focus” experiment.

³ Disability glare is glare that interferes with vision by blinding, veiling and dazzling and results in reduced visual performance.

Consequence: reduction of resolution or identification of a visual stimuli.

Discomfort glare is light because of its intensity, misdirection, or exposure time causes discomfort or fatigue. Consequence: avoidance of outdoor activities due to asthenopia

5 Low vision – Irlen syndrome

In this part of my presentation I will mention factors affecting visual performance, visual dysfunctions affecting visual performance and, „Needs“ and factors enhancing visual performance.

I will try to present common and varying factors. The presentation is based on Low Vision aspects and completed by aspects of Irlen Syndrome.

Vision is a very large and complicated system with many different aspects of perception. My list consists of several key words used by the ophthalmic, psychological and rehabilitation field. You will find in this list many common aspects, known in Irlen. But at the same time we have to separate carefully many visual manifestations (for example change of perception by magnification, light condition and duration of near work). We have to find out if it's a problem of size, of contrast, of lighting or of distorted perception. Many of these aspects interact.

Key words ⁴	Visual impairment	Irlen Syndrome
<p>Light hypersensitivity to light need for light Light concept</p>	<p>Vision is not possible without light. We can reduce our visual acuity by reducing light. So that lighting is at the same time one of the main measures to allow or to improve visual perception. If there is a hypersensitivity to light, too much light can reduce the visual performance. By the way, the need of</p>	<p>Light is a central aspect of Irlen Syndrome. It is a disorder of light sensitivity and inadequate background accommodation.</p> <p>s. Modena booklet on reducing or increasing visible daylight.</p>

⁴ Factors affecting visual performance
Visual dysfunctions affecting performance
„Needs“
Factors enhancing performance

Key words⁴	Visual impairment	Irlen Syndrome
	<p>light rises with age.</p> <p>Every Low vision patient has to be his own "lighting specialist". The need for light is very individual, depending on the influence of the daylight, on age on the disease and on different other aspects. Many patients need dim light other need more light. In every Low vision assessment and adaptation of the working place the lighting plays a very important role. Not only to improve the visual performance but also to create a general condition, avoiding fatigue, and reducing mistakes.</p> <p>more light, less light, my "lighting"</p>	<p>Irlen Syndrome sufferers also have to choose lighting in the same way.</p> <p>With Irlen filters, they can cope with various lighting in the same way.</p> <p>With Irlen filters, they can cope with various lighting situations more comfortably, but they may still choose to vary the light in working conditions.</p>
<p>Aspects of light</p> <p>Light sensitivity</p> <p>Light source</p> <p>Quantity of light, light intensity</p> <p>Quality of light</p> <p>Temperature of the light</p> <p>Fluorescence (flicker and sound)</p> <p>Position of the light source</p>	<p>All these aspects are important to both populations.</p>	

Key words⁴	Visual impairment	Irlen Syndrome
<p>Glare Glare control Scatter Colour temperature</p>	<p>Disability glare is glare that interferes with vision by blinding, veiling and dazzling and results in reduced visual performance.</p> <p>Consequence: reduction of resolution or identification of a visual stimuli.</p> <p>Discomfort glare is light which, because of its intensity, misdirection, or exposure time, causes discomfort or fatigue. Consequence: avoidance of outdoor activities due to asthenopia</p>	<p>Irlen Syndrome sufferers may describe the same Symptoms.</p>
<p>Visual acuity</p>	<p>Visual acuity is still in many countries the most important assessment part for clinical and optometric procedure although these figures cover a very limited part of the visual performance in general perception and above all in orientation and mobility and in daily living. In Switzerland the need for magnification and need for contrast became of great importance for the right to be given optical aids free of charge.</p>	<p>It is essential that an optical assessment occurs before Irlen testing because any acuity problems should be corrected by refractive lenses and these should be worn for testing.</p>
<p>Contrast need for contrast</p>	<p>Contrast sensitivity is another major condition for perception. Many defects of the visual system reduce the</p>	<p>A text presented in a higher contrast can become more or less readable for a Irlen patient. With overlays or filters</p>

Key words⁴	Visual impairment	Irlen Syndrome
reduced contrast perception	<p>perception of letters, words, phrases or in the daily living make the recognition of the border of a sidewalk more difficult. The border which is another shade of grey and the road along side the pavement is a third shade of grey. We live in a Low contrast environment and not in a visual acuity test environment. Think of the situation when it is rainy. Contrast enhancement is therefore another main technique in the visual rehabilitation field. Measure the contrast sensitivity is one of the very first tests we have to do when we work with visual impaired people.</p>	<p>we can influence contrast perception increase or decrease it. Black and white becomes acceptable rather than one dominating the other.</p> <p>Driving on a rainy night or driving into a low sun in winter, when driving can be very difficult. The glare which comes off the wet road can be blinding.</p>
<p>Colour abnormal or no colour sensation</p>	<p>The functional effect of colours is very close to contrast. When we adapt working places for Low Vision people the choice of colours on the screen (background and letters) is one of the first adaptive measures and can help to improve recognition and reduce fatigue.</p>	<p>I would like to refer to Barbolini's cone hypothesis. He identified three levels:</p> <ul style="list-style-type: none"> 1 set of cones malfunctioning – light sensitivity 2 sets of cones malfunctioning – pathological condition 3 sets of cones malfunctioning – Daltonism <p>Colour perception problems can affect any colours and are not necessarily</p>

Key words⁴	Visual impairment	Irlen Syndrome
<p>Resolution reduced resolution need of higher resolution Higher need of spacing (letters and lines) Reduced spacing (letters and lines)</p>	<p>By magnification you can make readable a distorted text for a Irlen patient. So you can resolve a problem of current interest. But we should try to find a solution on a deeper level of the problem. Using the correct filter glasses it can be possible to reduce the need for magnification and to raise comfort.</p> <p>Poor print resolution is found with both Low vision patients and Irlen patients. Low Vision patients can be helped by magnification or/and spacing enlargement (letters and lines) sometimes by reducing. It is to mention the crowding phenomenon (Visual acuity Test with group of letters or group of signs instead of single letters or signs), the reading visual acuity and the perception of words and phrases.</p>	<p>the same for all Irlen sufferers..</p> <p>In Irlen there are reported many more aspects in the context of poor print resolution: letters, words, printed page stability and instability changing vibration pulsate distorted unequal or insufficient spacing halos</p> <p>With the Irlen technology there is greater variety in assessment and treatment by overlays and Irlen filters.</p>
<p>Size need of magnification not big enough too big (tunnel vision)</p>	<p>In Switzerland the need for magnification is mostly the first step in Low Vision assessment for students and grown-ups. With tunnel vision sometimes it is necessary to give a smaller presentation on the screen.</p>	<p>Irlen patients occasionally need a change of print size, but this is only necessary when there are other acuity problems.</p>

Key words⁴	Visual impairment	Irlen Syndrome
magnifying aids (optical, CCTV, PC)		
Adaptation Reduced adaptation	With Low Vision people, light adaptation is considered in Irlen screening and in Irlen diagnosis. We have to give enough time to adapt the visual system for the overlays, for the filters and for the light condition. If we don't do so the results may not be correct.	It has been found that testing with Irlen patients has to be carefully measured. If the diagnostician overtests, the system can become so stressed that the individual can no longer make judgements about contrast or colour. Therefore testing may take 2 or 3 sessions to complete.
Accommodation Reduced or no accommodation		
Amplitude of accommodation Reduced amplitude of accommodation		

Key words⁴	Visual impairment	Irlen Syndrome
Stability of focus Multiple stability of focus Change of focus		
Depth of focus Reduced depth of focus	Magnifying glasses reduce the depth of focus. The higher the magnification the shorter the depth of focus.	Irlen filters may raise the depth of focus within the limits given by optical conditions.
Visual field Reduced visual field Disturbed visual field (scotoma)	The reduced or disturbed visual field is a typical Low vision problem. People with a visual field problems (tunnel vision, scotomas), need aids and training to hold the line, to change the line and to construct words. There are several training forms available: reading letters: different fonts words short, long phrases, short, long vertical, one word texts vertical, one word, size decreasing texts flashing presentation training for visual word imagery Many teaching methods for strategies with reading difficulties do not work if	All those exercises are useful for everybody. It makes sense for Irlen patients if we can change and improve the perception itself before training begins, if not we train something which the person isn't able to do. Inappropriate training activities reduce energy level, motivation an self esteem. It would be better going for a walk then to make those exercises which fix the negative experience.

Key words⁴	Visual impairment	Irlen Syndrome
	Irlen Syndrome is not addressed.	
Span of recognition Reduced or disturbed span of recognition	The reduced span of recognition is a common Low vision problem too. People with central scotoma need aids (mostly magnifying glasses) and training to improve reading. What I would like to mention is that in speed reading programs you find always exercise to enlarge the span of recognition.	Irlen patients having a problem with the span of recognition can not expand it without Irlen treatment.
Visual perception	With no or reduced visual perception, a person is unable to perceive visually body language and facial expressions or has a reduced perception of this important part of communication.	It has been found that this particularity applies to Irlen patients who are on the Autistic continuum.
Non visual factors affecting performance	Individuals with visual impairment not only have functional disorders, very often they have secondary effects of Low Vision such as a poor self concept and have problems of motivation. It is our job to offer the basic aids and techniques to allow the function before we start to train the different tasks. If the letter is too small for a visual system we can't train to read it. If a dyslexic person can't make an	

Key words⁴	Visual impairment	Irlen Syndrome
	image of the word it is very difficult to write it. So we have to give the optimal image first before we let them write.	
Others aspects:		
Distance need of distance		
Convergence power Reduced convergence power		
Ocular motility		
Binocular co-ordination defects, corresponding retinal points, fusion		
stereopsis		
multistability		
Visual awareness		
Lack of sustained attention		
Time of recognition		
Skills		
Training		
non-visual aids		
Ergonomics		

Remark

With specially prepared spectacles we can simulate functional disorders such as need of magnification, restricted visual field and reduced contrast sensitivity. Understanding the functional effects helps to avoid expectations which can not be performed by a visually impaired person and offers at the same time the base for developing compensatory techniques acceptable for the society.

It would be interesting to simulate the functional effects of Irlen Syndrome. The perception of the world in a different way is a personal experience which is difficult to explain. Therefore information has to be given by the patients themselves or by the mean of case studies as it had be done by Helen Irlen and other specialists. Patients need very often a new language to explain the different phenomena making the different tasks. We need more people "living and showing" the benefits of the identification and treatment of the Irlen Syndrome.

Is Irlen Syndrome a perceptual impairment that must be categorised as a "visual Impairment" in some people?

6 Conclusion

Up to now the Low Vision assessment was mostly limited to the evaluation of the visual performance: visual acuity, need for magnification, contrast sensitivity, colour perception, visual field, glare, fatigue.

Visual impairment is bad enough. When visual impairment and Irlen Syndrome are combined then we have to make a double assessment, Low Vision and Irlen.

Some effects of Irlen can be reduced by measurement of Low vision rehabilitation.

With the Irlen Screening and Irlen diagnosis we will be able to enlarge the assessment and integrate very important parts of the visual performance.

If we see these variations of disturbed functions, we can notice many similarities and several differences. It is important, that these "interfaces" between visual impairment and Irlen Syndrome are seen and are used for developing concepts of treatment for Low Vision and/or Irlen patients, every time for the profit of the patient and the method.

The results we have up to now don't allow us to decide if we have to deal with the Irlen Syndrome or if we have to deal with new aspects of the visual impairment. Is the Irlen Syndrome a perceptual impairment that must be categorised as a visual impairment? The question may be interesting. For concerned patients it doesn't matter. The most important thing is how they can be helped and how their visual performance and their comfort can be improved.

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ⁱ Robert Rosenberg, O.D., Glare, in Vision Rehabilitation, Swets & Zeitlinger, New York, 2000

ⁱⁱ Irlen Helen, Reading by the colors, Avery Publishing Group Inc., New York, 1991, p. 35