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Letter from the editor

Welcome to Issue 3 of ISLRR VIEW!

In this issue you can read about two very exciting new developments in low vision rehabilitation: augmented reality and retinal implants. It is encouraging to see such high-technology research being performed in our field, and it reminds us that low vision research really is at the cutting edge of medical, rehabilitation, and technology research.

As well as looking forward, we have the first in our new series once upon a time in low vision. In this series we ask senior researchers and clinicians to write about past events in the area of low vision rehabilitation and research. These are stories which may have been told over dinner at a conference but would not previously have been printed anywhere. I hope you will find these pieces interesting and that they can provide some form of insight into the earlier days of our field.

You can also read a book review, a letter from Hong Kong, and a preview of the Vision 2017 meeting.



See you in The Hague!

Michael Crossland, London, UK

E-mail: islrview@gmail.com

Augmented Reality (AR) & Virtual Reality (VR): A high tech low vision aid

Elodie Draperi, London, UK

A London-based start-up has been developing a device combining AR and VR to assist people with severe sight impairments. This software company leverages off-the-shelf technologies to turn it into a high tech low vision aid.

SightPlus is a pair of goggles that enhances people's remaining sight. It is like a sophisticated wearable magnifier that helps partially sighted people to see clearer up close and at the distance.



The device has been tested with more than 350 people covering 30 different sight conditions from central vision loss to peripheral vision loss. In general, people using a magnifier have noticed some good results in term of clarity, capturing more visual information. However, there is no sure way to know if it will work on all partially sighted people until they try them, to make sure they feel comfortable wearing the goggles. To date, one third of interested participants took the device home. The team interviewed all the testers before, during and after the trials. A group of people decided to purchase the device through the “early adopter” offer.

The trials show that people use SightPlus mostly for indoor activities such as reading, watching TV (from their sofa!), recognising people's faces and doing hobbies such as painting, playing music or knitting (thereby requiring a device that is hands-free). The group of people that decided to keep the device reported being able to do things that they couldn't do before with other accessibility tools. They also reported feeling more active and independent.



Augmented Reality (AR) & Virtual Reality (VR): A high tech low vision aid (cont.)

Elodie Draperi, London, UK

It is important to highlight that this product is not designed to be a mobility aid and can't be used to walk around outside. However, many users like using SightPlus at the bus stops to read timetables, or menus at restaurants, as well as at sports events or even supermarkets.



The company keeps improving the product testing new hardware. It is currently offering a selection of 3 headsets and is adding more functionalities. Their “early adopter” offer includes free upgrades for life as well as hardware replacement during the first 2 years. To test the device, individuals can just sign up [online](#). The company’s offices are in London and Birmingham. It is important to note that the company also works closely with a few charities across the UK. The device is not available internationally yet, since the UK is set as the pilot for the development of this device.

For any additional information or demonstrations, please get in touch with elodie@givevision.co.uk



Intelligent retinal implants: A view of the future?

Hannah Dunbar, London, UK

Pixium Vision are currently trialing the second-generation of their Intelligent Retinal Implant System (IRIS II) in a multicentre, open label, non randomized trial across 9 European sites:

- ◆ Moorfields Eye Hospital NHS Trust, London
- ◆ Hôpital des Quinze-Vingts et Fondation Ophtalmologique Rothschild Paris
- ◆ CHU de Nantes Clinique Ophtalmologique
- ◆ CHU Nimes Service Ophtalmologie et CHU de Montpellier
- ◆ Augenklinik der Medizinischen Universtaet Graz
- ◆ Klinik und Poliklinik für Augenheilkunde Hamburg-Eppendorf
- ◆ Dept. of Ophthalmology, University of Bonn
- ◆ Universitäts Klinikum, Klinik für Augenheilkunde Freiburg
- ◆ Institute of Ocular Microsurgery - IMO Barcelona

The **Compensation for blindness with the Intelligent Retinal Implant System in patients with retinal dystrophy** study aims to confirm the safety and performance of the IRIS II. It is hoped IRIS II will restore limited visual perception to individuals who have lost their sight due to outer retinal disease.

The study is using IRIS II in people with Retinitis Pigmentosa (including Usher Syndrome), Choroideremia or Cone Rod Dystrophy who have functional ganglion cells and optic nerve activity and a visual acuity of worse than 2.3 LogMAR in each eye as measured by the Freiburg Visual Acuity Test (FrACT). In addition, patients should be over 25 years old and have a memory of useful form vision. They must also agree to attend an extensive rehabilitation programme across an 18 month period.

IRIS II system comprises 3 components: a visual interface, a pocket computer and a 150 electrode epi-retinal implant. The visual interface is in the form of pair of goggles with a special bio-inspired mini camera mounted on the front and an infrared transmitter on the back, positioned in front of the pupil of the implanted eye. The pocket computer generates stimulation commands based on the images captured by the camera in the goggles. These simulation commands are sent via cable back to the goggles and then transmitted wirelessly via infrared through the pupil to the implant causing corresponding electrodes placed on the retina at the back of the eye to be stimulated, evoking light or phosphenes in the patient's visual field.





Intelligent retinal implants: A view of the future? (cont.)

Hannah Dunbar, London, UK

The IRIS II system implant has a 150-electrode array and is implanted into the worse seeing eye. Following satisfactory healing of the eye after implantation, the system is switched on (usually around 3-6 weeks post op). Initially artificial simulation is delivered to the implant in order to test the system and define thresholds across the 150-electrode array before the camera is switched on.

The camera can operate in one of four modes which can be selected by the patient, each of which create stimulation of electrodes in response to different features within the image captured by the camera: the first highlights bright objects against a dark background, the second highlights dark objects against a lighter background, the third focuses on contours within an image and the fourth is event driven focusing on changes in in visual scene, like motion within an image.

Initially the perception of phosphenes will be quite confusing for the patient; therefore patients need to be taught to interpret these phosphenes as meaningful images by attending around 50 rehabilitation sessions for the clinical trial over the course of the 18 month study period. Patients will also use the system at home once they have learned to interpret this new perception.

Though safety is the primary outcome of the study, a variety of visual function measures will be used to assess the performance of the IRIS II system (secondary outcome). These are measured at baseline (before implantation), 3, 6, 12 and 18 months. At all post implantation time points these will be assessed both using the system and without the system. Visual function tests include the FrACT grating acuity test, square localization (identifying the position of a white square on a black touch screen monitor), direction of motion (identifying the direction of motion of a white bar across a black touch screen monitor), Goldmann kinetic visual fields and a computer based test where patients view a real world image on a computer monitor and are asked to locate the position of specified target.

To date 10 patients have been implanted across the 9 sites and the 18 month follow-up results are expected late in 2018.



VISION 2017, a global experience!



Dear colleagues,

Since the autumn edition of the ISLRR Newsletter, the board and steering committee have been increasing their pace to make the triannual Vision conference a success-story. Thanks to those who have been inviting colleagues in the field with the purpose to submit a full symposium, those who have been organizing workshops and those who have decided to take up a position in the science committee, or have submitted an abstract, Vision 2017 will be a great success indeed!

Some statistics: There are currently 28 symposia, 6 workshops, and interesting keynote speakers such as Gordon Legge (professor of psychology and neuroscience, University of Minnesota), Penny Hartin (CEO of the World Blind Union, Canada) and Hans Limburg (ophthalmology consultant Vision 2020 the Netherlands) have been confirmed. Apart from that, over 300 abstracts have been submitted in the open round of which two thirds are submitted as oral presentations (others preferring to present a poster or have no preference). People who submitted abstracts before the first deadline are from 42 different countries around the world. On a continent level, there are 135 submissions from Europe, 74 from Asia, 39 from North America, 28 from Australia and New Zealand, 13 from South America and 2 from Africa.

Currently, the abstracts from the open submissions are assessed on their quality by the more than 30 members of the science committee. After the assessment of abstracts we will know even more precisely which parallel sessions will be available, but for now, we checked which topics most prominently stood out in the abstracts for an update of our preliminary program. To check out the update: <http://www.vision2017.org/programme-glance/>.

Don't forget to register before the early bird deadline, make sure you make your reservation for our beach BBQ and don't miss out on the interesting site visits on Thursday afternoon to either Royal Dutch Visio, Bartiméus, the Robert Coppes Foundation or the Royal Dutch Guide Dog Foundation. The site visits require reservations as well.

On behalf of the Vision 2017 board – Ger van Rens, Bart Melis-Dankers and myself – and from the bottom of our hearts, we welcome you to the Vision 2017 conference, which will be held from 25-29 June in the Hague, the Netherlands!

Ruth van Nispen, PhD, *Secretary Vision 2017 conference*, VU University Medical Center Amsterdam, dept. Ophthalmology & Low Vision Research





ANNOUNCEMENT

ISLRR is offering a limited number of travel fellowships for Vision 2017 –

The 12th ***International Conference on Low Vision Research & Rehabilitation.***

These fellowships will primarily be given to individuals, especially students, from developing countries and/or those who can demonstrate financial need.

In order to apply for these travel fellowships, please send the following information:

A one-page letter explaining the financial need

A copy of the submitted abstract(s) where you are the lead author

Proof of student status (if applicable)

TO:

Ms. Rand Allabade

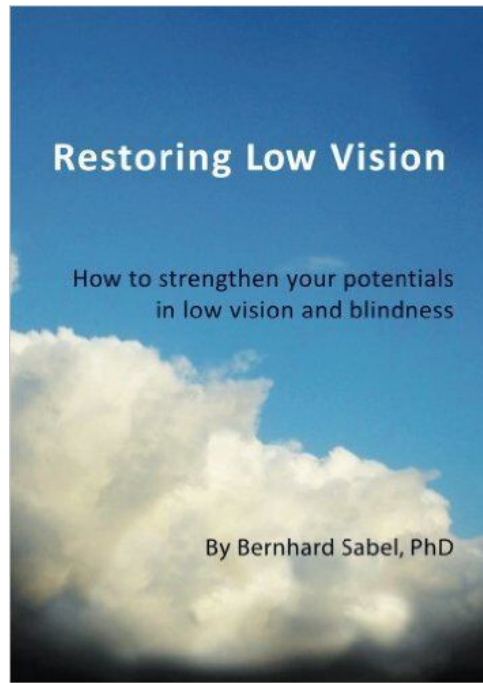
inquiries@islrr.org

The required materials must be received by March 19, 2017.



BOOK REVIEW: Restoring low vision, by Bernhard Sabel

Reviewed by Michael Crossland, London, UK



This interesting and upbeat book is written for those with vision loss and their relatives and provides a holistic overview of low vision rehabilitation. Given Prof Sabel's reputation in neuroplasticity and vision restoration using vision training and electrical stimulation, it is no surprise to see a relatively large proportion of the book devoted to these areas. However, Sabel discusses a large range of other topics, such as positive thinking, the emotional response to sight loss, nutrition, relaxation, and sensory substitution.

The author bases this book on the findings from different fields, including ophthalmology, neurology, psychology, and rehab care. He does acknowledge that there is some controversy in the scientific community around some of the techniques he discusses, and I was pleased to see that Sabel manages the reader's expectations: on page 1, he discusses the importance of learning that "your vision will never be normal again," he counsels that people are unlikely to restart driving following vision rehabilitation, and he acknowledges in one case study that we "do not know if vision would have recovered on its own if [the patient] had done nothing." Whilst optimistic, the book does not fall into the trap of offering false hope to people with visual impairment.

It is refreshing to read a book which is so positive and upbeat about sight loss and which contains so many practical tips for living with visual impairment, and which gives an overview of risk-free (if non-evidence based) techniques such as "eye yoga" and relaxation exercises. I enjoyed reading it and would recommend it, in conjunction with other books, to people with visual impairment.

Restoring low vision is published by the SAVIR-Center (www.savir-center.com) and is available on amazon.com as hard copy at \$48.50 and also available as a Kindle e-book.

Once Upon A Time in Low Vision - Before it was low vision -

Gregory L. Goodrich, Ph.D., F.A.A.O. Vision Rehabilitation Research Consultant
Sea Bright, New Jersey

The title for this journey into the history of our field notes the importance of how we conceptualize our profession and how we, and society, conceptualize individuals with low vision. Do we see our field as a charity, a business, or some mix between the two. Neither a charity or a business is inherently “good” or “bad”, but given the law of unintended consequences each may color our view of our selves and our clients. Charity may give a perception of something done for someone who is helpless, unable to provide for themselves. Business may give the perception of something being done within the ethics of business leaving the consumer to understand what is in their own best interest – which is not necessarily true for people with low vision. I would argue our field, at present, uses neither a purely charity or business model, but a mix of the two with elements of the profession of medicine thrown in.

Drs. Eleanor Faye and Gerald Fonda first coined the term “low vision” in 1953, while working at the Lighthouse for the Blind in New York. Lylas Mogk and I have argued that it was only after this term came into existence that the field began to gain momentum as a profession (JVIB, 2004, 98). So, why was the term “low vision” so important? The simple answer is that previous terms were inaccurate and pejorative.

Historically references to blindness are very old, predating the Old Testament. The term blind refers to the absence of vision and it seems obvious that this is different than having vision, even limited vision. So, what terms have been used for those with limited vision?

There have been many terms in the English language and likely in other languages as well to describe low vision. Some, used over the last two centuries, simply modified “blind” as in definitions of “legal blindness”. One can argue that this was an improvement especially considering alternative terms. Among these terms were “partially blind”, “subnormal vision”, “destitute of vision”, “blink”, “weak-sighted”, “sight impaired”, and others.





Once Upon A Time in Low Vision - Before it was low vision - (cont.)

Gregory L. Goodrich, Ph.D., F.A.A.O. Vision Rehabilitation Research Consultant
Sea Bright, New Jersey

Randy Jose, O.D. (editor of *Understanding Low Vision* and co-author with Paul Freeman, O.D. of *The Art and Practice of Low Vision*) relates an amusing and informative story that occurred while he was a fellow at the School of Optometry, University of California, Berkeley. The incident occurred in the late 1960s and illustrates the importance of terminology both from the personal and professional perspective. At the time the optometry clinic seeing these patients was named the “subnormal vision clinic” which was a practicum class for optometry students. Dr. Jose had just left his optometry students in the subnormal vision clinic and stepped into the hall when the clinic receptionist saw him from the other end of the hall. In a loud voice called out to him “Dr. Jose, your subnormals are here!”. The patient and her husband were ushered into the clinic and the patient seated in the exam chair. At this point the patient’s husband walked up to Dr. Jose and sternly said “What’s this about subnormals? I’ll have you know my wife is a Nobel Laureate and I’m also a Nobel Laureate!”. Astutely recognizing a crisis in the making Dr. Jose excused him and ran to the office of the dean of the school. A very short time later a contrite (and somewhat out of breath) dean was profusely apologizing to both Nobel Laureates. The very next day the subnormal clinic was renamed the clinic for the partially sighted.

There was a time before “low vision”. As I write this on the last day of January 2017 in the United States of America I am particularly aware that history is important. As the philosopher George Santayana¹ noted: “Those who cannot remember the past are condemned to repeat it.” I urge all of us to remember our history so that we can continue the momentum gained when the term “low vision” was first coined some 60 years ago.



Gregory L. Goodrich



ISLRR View: Letter from Hong Kong

Potential impacts of excessive lighting and disability glare on visual accessibility of the environment

Allen MY Cheong, School of Optometry, The Hong Kong Polytechnic University



Visual accessibility of the environment is essential for safe and independent travel. Poor lighting reduces the visibility of hazards such as unexpected steps or obstacles. Increasing lighting levels in general improve visual and balance function, particularly in older or visually-impaired individuals. Despite extensive literatures supporting the enhancement in visual function by increasing lighting levels^{1,2}, some patients have reported that stronger lighting increases the amount of scattered light within the eye, resulting in a higher sensitivity to disability glare or visual discomfort¹. Clinically, some low vision patients report having difficulty navigating under excessively illuminated environments.

Other than visual discomfort, excessive lighting and glare environment may also reduce the visibility of hazards, imposing a detrimental effect on individuals' postural stability or mobility performance. In current literature, little is known on the impacts of excessive illuminance levels and disability glare on balance function in people with vision loss. Further research is needed to address the optimal range of illuminance which accommodates the needs of people with normal and low vision in public areas such that we can all access barrier-free environment in our community.

References:

1. Boyce P. Lighting for the elderly. *Technology and Disability* 2003; 15:165-80.
2. Haymes SA, Lee J. Effects of task lighting on visual function in age-related macular degeneration. *Ophthalmic and Physiological Optics* 2006; 26:169-79.