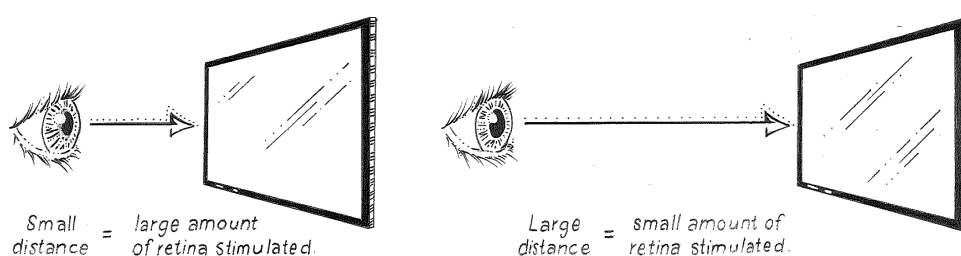


## Chapter 6. Things to try at Home and School

1. **Sit next to a window** rather than under artificial light, especially when using digital media. The 'flicker' from fluorescent lights and screens or glare from some LED lights can make it uncomfortable to work in (Harding & Takahashi, 2004). Gentle natural light is best (full sun can also cause glare). At school, request that teachers keep the blinds/curtains open when using the Interactive Whiteboard (IAW). A darkened room when watching the screen increases the proportion of artificial light absorbed by your child's eyes and increases the adverse stimulation of the brain. In the evening, watch the television or use the computer with an external light on (Furusho et al, 2002)

2. Encourage your child to **sit up the back** when watching large screen televisions, IAWs or data projector screens. This decreases the amount of stimulus received by each retina while viewing (Wilkins, Emmett & Harding, 2005).



Distance from Screen versus Amount of Retinal Stimulus

A decreased percentage of the retina being stimulated by light from the screen also allows more natural light to be absorbed by the retina during periods of viewing.

100Hz televisions are safer to view than the old 50Hz CRTs (Fylan & Harding, 1997). Plasma and LCD screens have adjustable contrast and luminance settings, so can be set to reduce the stimulus. High luminance and high contrast Plasma and LCD screens are more stimulative. Seating distance is important to remember with any screen viewing. The recommended minimum distance is 3 times the width of the screen (Kasteleijn Nolst Trenite, 2012). Some IAWs include in their instructions that no student should be closer than 2m to the board.

3. Pirate **eyepatches** are a unique strategy, and will be child dependent upon whether it is practical for school. At home it can be very useful.

‘Hypersynchronous’ is a term used to describe the way groups of neurons can fire off at the same time, in many parts of the brain. This is not usually a good thing. The brain thrives on small amounts of continuous chaotic bursts of energy, with thousands of different things happening at different times. A visual stimulus that causes a lot of the brain to react exactly the same way at exactly the same time causes other clinical symptoms like headache, fatigue and nausea.

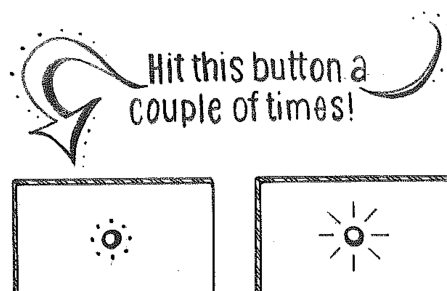
To avoid the whole brain, or even the whole occipital lobe being stimulated hypersynchronously, try using an eyepatch. If only one eye is receiving the stimulus, then only one side of the brain is being externally stimulated (Verotti et al, 2012; Takahashi et al, 2004). If the total external stimulation is halved, then maybe the symptoms of headache, fatigue and nausea can be decreased. This is a simple strategy, but can be very effective. There are other things to remember with this method (not mentioned in the student section).

1. Take a break from the eye patch every 30 minutes
2. Swap eyes after each break
3. Don’t let the patch put pressure on your eye

These three are to maintain the physical well being of the eyes.

Both 4 and 5 focus on personal computer or tablet use, but it would also be helpful if they could be expanded to classroom projectors and IAWs.

4a. **Turn down the luminance** (brightness) of the screen. The brighter the light coming from the screen, the greater the stimulus (Kowacs et al, 2001). Finding a gentle luminance (not so low that you have to squint to see it) is important.



On an Apple computer, these little buttons control the luminance and show little bars to indicate the set level. Encourage experimentation with luminance in different settings, this allows variation with each environment. Your child should end up with preferred settings like this...

Classroom 5B (big windows)	4 <sup>th</sup> bar
Classroom 2A (small windows)	6 <sup>th</sup> bar
Home (afternoon)	4 <sup>th</sup> bar
Home (night time)	7 <sup>th</sup> bar

Also ensure there is always an external light on while your child uses their computer at night, so that they are not only absorbing the light from the computer screen (Verotti et al, 2012).

**4b. Turn down the contrast ratio.** Contrast ratio is the ratio between the lightest colour the screen can produce (white) and the darkest colour the screen can produce (black). Evolution in monitors and projectors has used increased contrast ratios as a selling point for clearer, more vivid images. They are also more stimulative (Wilkins, Emmett & Harding, 2005; Kasteleijn Nilst Trenite, 2012). Students with photosensitivity should decrease the contrast ratios on their personal computers. As a parent you can request that the school reduce the contrast ratios on IAWs and for data projectors in the classrooms used by your child.

Some monitors, tablets or laptops will allow the contrast ratio to be decreased within 'Settings' or 'Profile'. The options may be limited, so choose the one that makes the colour black not look so 'black'.

Eg Apple laptop

→ System Preferences

→ Display

→ Colour

→ Gamma Setting

Default setting – Gamma 2.2 (Higher Contrast)

Photosensitive preferred – Gamma 1.8 (Lower Contrast)

Some laptops do not allow alteration of default to lower contrast settings, but do offer higher contrast options. In these cases just use the default (lowest) contrast option, and team that with a variable luminance for different environments.

5. When using a computer, make sure that your son or daughter takes a **15 minute break** at least every 45 minutes. Every child is different. Some will be able to work through to 45 minutes, others will begin to work less efficiently after 30 minutes. Break times are important to use, as they allow a more productive day with fewer repercussions. The break time should be taken BEFORE it is needed. If your son or daughter needs a break, they have been going too long. (Note: break times should not include screens of any type.)

6. When using a computer, tablet or IAW **avoid the colour 'saturated red'**. This is a very deep, dark, vibrant red (wavelength greater than 700nm). The human eye is less able to cope with light of this wavelength. There are no opposing colour cells in your eyes that effectively balance saturated red, so the stimulus can be uncomfortable, even for people without photosensitivity. Any screen movement involving this colour can be epileptogenic, even in people without epilepsy. Television broadcast stations are prohibited from airing any program that uses this colour in a flickering pattern (Ofcom Broadcasting Code, Rule 2.12, 2011; ITU-R BT 1702 – this is the recommendation that became a ruling in the Ofcom Guidelines, just shorter and easier to read).

7. When using a computer, tablet or IAW **avoid using fast repeated flashes or stripy moving images in any presentation** (Wilkins, Emmett & Harding, 2005). Television broadcasters are prohibited from airing segments containing more than 3 flashes per second (>3Hz) or segments where the flashing segment takes up more than one quarter of the screen (Ofcom Broadcasting Code, Rule 2.12, 2011; ITU-R BT 1702).

8. **Wear a peaked cap** indoors. This reduces the amount of glare from artificial lights and is especially useful in school environments where there can be banks of fluorescent lights.

9. **Blue or grey tinted sunglasses** can decrease the simulation or glare from artificial lighting and screens (Kepecs et al, 2004; Capovilla et al, 2006; Wilkins et al 2005; Verotti et al, 2012). Data regarding 80% and 60% tints can be found at Royal Society for the Blind (see contacts page). They have ranges of glasses for smaller people, male and female. Verotti and colleagues (2012) suggest using lenses if an uncomfortable feeling is reported by the student. If you wish to consider the blue Z1 lenses investigated by Capovilla, then you can reach an optometrist who produces them through this webpage <http://videogameseizures.wordpress.com> . Other optometrists can also advise, see the lists on pages 26-27 for a contact in your capital city.

10. **‘Get enough sleep’** cannot be said enough. This is so important. A seizure can be brought on in any individual given particular circumstances (Engel, 2005). Sleep deprivation decreases everyone’s seizure threshold, as well as making people less able to cope with other stimuli (Kasteleijn Nolst Trenite, 1989, 2012). Data showing a correlation between fatigue and photosensitivity in a group of second year medical students was released in 2011 by Shigihara, Tanaka and Watanabe. This means that as the fatigue increases, the photosensitivity increases and visa versa. The evidence does not show which one CAUSES the other.

Unfortunately, sleep can also be one of the more difficult variables to regulate. No screentime (using back lit monitors) for one hour before bedtime can assist by allowing melatonin levels to rise, letting sleep come more easily.

## Chapter 7. Contacts for Parents

### Online support

[www.photosensitivity.info](http://www.photosensitivity.info)

The photosensitivity.info website is the online partner to this book. Launched in 2014, it aims to provide parents and teachers with notification of any changes in policy, printable record sheets, links to supportive agencies and other information.

[www.headachehelp.org.au](http://www.headachehelp.org.au)

Headachehelp is a not for profit organization providing information and assistance to people (and those who care for them) diagnosed with headache or migraine. Based in Western Australia it promotes research and is connected with the global initiative *Lifting the Burden*. The Headachehelp website is a good resource for information sheets.

[www.videogameseizures.wordpress.com](http://www.videogameseizures.wordpress.com)

An online blog by Jessica Solodar. Jessica has journeyed with her family, supporting her daughter who has photosensitive epilepsy. This is a practical resource with real world examples and issues.

### Sourcing Sunglasses

#### Royal Society for the Blind

Based in South Australia, the Royal Society for the Blind works with vision impaired students, as well as those who have lost their sight. By contacting the 'Shop', you can discuss head sizes for child size glasses, which are available to mail out. There is also an online shop ([www.rsb.org.au](http://www.rsb.org.au)) for adult size glasses. You can contact the shop by email [sales@rsb.org.au](mailto:sales@rsb.org.au) or phone on 8417 5599.

## Western Australia

### ***Eyes on Oxford ([www.eyesonoxford.com.au](http://www.eyesonoxford.com.au))***

Phone: (08) 9242 2342, 217 Oxford Street, Leederville, Perth.

Steve Leslie and Liz Wason lead a team of paediatric optometrists, and Steve coordinates the Special Olympics Opening Eyes Program of Vision Care. Steve and Liz are Fellows of the Australasian College of Behavioural Optometrists (ACBO <http://www.acbo.org.au>).

### ***Bullcreek Optometrist ([www.bullcreekoptometrist.com.au](http://www.bullcreekoptometrist.com.au))***

Phone: (08) 9332 7222, Suite 1, Bullcreek Health Centre, 78 Calley Drv, Leeming, Perth.

Gary Cerie is the principal optometrist, he also works with various community groups throughout Western Australia. These groups include the Dyslexia Speld Foundation and the Red Cross. Gary is a Fellow of the Australasian College of Behavioural Optometrists (ACBO <http://www.acbo.org.au>).

## Victoria

### ***OPSM Eye hub***

Phone: (03) 9819 5424, 174-176 Burwood Road, Hawthorn.

The OPSM Eye hub has a large team of optometrists and a wide range of children's frames and lenses. Ms Connie Tsang is a Member of the Australasian College of Behavioural Optometrists (ACBO <http://www.acbo.org.au>).

## South Australia

### ***Gulf and Ranges Optometrists (<http://www.gulfandranges.com.au>)***

Phone: (08) 8642 2766, 7 Chapel Street, Port Augusta

David O'Connor has a professional interest in the provision of vision needs to those in rural and remote communities, as well as behavioural optometry. He is a Fellow of the Australasian College of Behavioural Optometrists (ACBO <http://www.acbo.org.au>).

## Northern Territory

### ***Eyecare Plus Optometrists (<http://www.eyecareplus.com.au/darwin>)***

Phone: (08) 8995 9595, The Avenue, Shop 105, 12 Salonika Street, Parap.

Helen Summers is the principal optometrist of a practice based near Darwin. The group runs visiting clinics covering 1500 square kilometres of the Northern Territory. Helen is a Fellow of the Australasian College of Behavioural Optometrists (ACBO <http://www.acbo.org.au>).

## Queensland

### *OPSM Toowoomba*

Tel: (07) 4638 5799, OPSM Shop 107, Grand Central Plaza, Margaret St, Toowoomba City  
Saleem Ha is a Member of the Australasian College of Behavioural Optometrists (ACBO  
<http://www.acbo.org.au>).

### *OPSM Northlakes*

Tel: (07) 3482 2099, Shop 1113, Westfield S C. Northlakes Drive.

Mango Hill, Queensland

Sarah Sweeney is a Member of the Australasian College of Behavioural Optometrists (ACBO  
<http://www.acbo.org.au>).

## New South Wales

### *UNSW Optometry Clinic (<http://www.optometry.unsw.edu.au/clinic/unsw-optometry-clinic>)*

Phone: (02) 9385 4624, Level 1, North Wing, Rupert Myers Building, University of NSW, Kensington Campus.

Rosemary Paynter co-ordinates the Children's Vision Clinic at the University of NSW

Optometry Clinic. This clinic focuses on the needs of children, and Rosemary is a Fellow of the Australasian College of Behavioural Optometrists (ACBO <http://www.acbo.org.au>). She also runs the Visual Stress Clinic which conducts specialised assessments for visual photosensitivity. For further information on these services please email the UNSW Optometry Clinic on [optomclinic@unsw.edu.au](mailto:optomclinic@unsw.edu.au)

### **Australian Capital Territory and Tasmania**

To be determined – will update on photosensitivity.info

## Chapter 8 Introduction for Teachers

This handbook is aimed at easing some of the burden of data collection for teachers or education assistants working with any student who has difficulty working with digital media, or has been diagnosed with photosensitivity.

**Chapter 9 Background** - is not necessarily for the first day. It gives some background as to how and why some of these adverse reactions happen.

**Chapter 10 Strategies** - these have all been implemented in different educational situations. They are also all adapted from medical literature and are worth trialing and documenting help/not sure/no help for an individual student (there is a student checklist on page 12, a teacher checklist on page 35 with an additional comments page and a template on the website).

**Chapter 11 Diaries and Observation Records** - as teachers we cannot diagnose photosensitivity or photophobia, but our observations and professional opinions regarding changes in student behaviour and ability can support medical professionals and aid agencies. Thank you to the societies and individuals who have generously provided access to these documents. Each document has a web address viable January 2014.

**Glossary** - provided to assist with terminology. Unfortunately even within the medical literature there is some discrepancy in specific terminology, but this ties some of the synonyms together.

**References** – the medical articles supporting the strategies.

Finally, in this digital age there is an online ‘companion’ to this handbook ([www.photosensitivity.info](http://www.photosensitivity.info)). This website is for printable access to templates, to log changes in policy and invite feedback.

Thank you for taking the time to work through this for your student – it can change the way they view school.

## Chapter 9. Background

Firstly, I am not advocating cessation of digital media use in classrooms. That would be ridiculous. Through digital media we have gained a window into an (often) inaccessible world and this can be used with great expertise to enthuse students, and inspire them.

Secondly, as teachers we cannot diagnose photosensitivity. The valuable resources teachers bring are the many hours of working with, observing and academically accessing students. Changes in behavior, mental acuity, alertness and classroom involvement are all observations that can support the diagnosis of a clinician or physician.

Two types of photosensitivity are discussed in this book – neurological and optical. Neurological based photosensitivity is where hypersynchronisation of overexcited neurons cause disruption in cognition (super electric brains), and optical based photosensitivity (exceptional eyeballs) is where a feature of the eye causes extra messages/mixed messages sent to the brain. Overstimulation causes many of the symptoms, therefore strategies have been developed to decrease that risk in the classroom.

As teachers, we have all observed students who have acted a little differently, become withdrawn, or performed below ability in an assessment. Sometimes we can justify the anomaly, other times we watch and wait to see if it is recurrent.

When a pattern seems to be emerging regarding non-completion, or a behavioral change, our notes become critical to the medical personnel. A parent supported with a handful of observation sheets from the school, as well as observation sheets from home can save weeks of time. Time is important once school is underway, especially for Upper School Students.

As a teacher, never think that an observation sheets (like page 34) showing

- No disruptive behavior
- No headaches

is not worth reporting. For a student at risk medically, this also shows the type of day that triggers were not encountered, or thresholds were higher – both constituting important information.

### **Why Bother?**

These strategies help reduce the physiological strain on students with photosensitivity, and may have a by product of increasing their positive behavior patterns. Positive behavioural patterns in class are always appreciated and allow more time to be spent on engaging students in learning activities, rather than discipline.

### **Transitory Cognitive Impairment (TCI)**

The name is self explanatory, applicable to students with super electric brains, rather than exceptional eyeballs . The episode is self limiting, but TCI can happen whenever photosensitivity is triggered. Research is divided about how much the memory is affected by sub-clinical episodes (those that don't register on any where else except an EEG), but it definitely affects the consciousness of a student during the episode. Potential Air Traffic Controllers in Europe all get tested for neurological photosensitivity before being allowed to start their training (Kasteleijn Nolst Trenite & Vemeiren, 2005). Episodes are generally very short (less than three seconds) but can happen over 100 times in a day. The more triggers that stimulate a reaction, the more TCI, the more difficult for a student to fully engage in the current learning experience.

However, decrease the stimulus → decrease the TCI → increase engagement.

### **How many students?**

Good question - the population counts vary. Overall between 1 – 8% of students in Australia aged 7-15 years are photosensitive. From paediatric

investigations, Kasteleijn Nolst Trenite and Veneiran (2005) reported 1.4% of their random sample were photosensitive, whilst Nagarajan et al, (2003) reported 7.9% (using convenience sampling). Full population statistics are skewed partly due to the fact that 1/3 of students with photosensitivity lose the trait in their early 20s (spontaneous remission with no known cause). Photosensitivity can exist by itself, or it can exist alongside another trait. Students with migraine or headache disorders are often photosensitive or become photosensitive during an episode. 'Headache has been underestimated, under-recognised and under-treated throughout the world' (World Health Organisation, 2012). According to Dr Miller Horn at the Children's hospital in Boston, up to 25% of students with ASD are photosensitive. Students with IGE (Idiopathic Generalised Epilepsy) or Occipital Lobe Epilepsy as well as PSE (Photosensitive Epilepsy) can have photosensitive triggers (Kasteleijn Noist Trenite, 2012). So there is a reasonable likelihood that any randomly selected mainstream class will have a student with photosensitivity. For those of you who like statistics, I have included the table below (of course the percentages increase as the class size increases).

**Table 1: Probability of photosensitive students being in a class of 24 students, with age specific population incidences of 1.4%, 4.7% and 8.0% (Sproul, 2014)**

<b>N° Photosensitive Students in Class</b>	<b>1.4%</b>	<b>4.7%</b>	<b>8.0%</b>
<b>0</b>	71.3%	31.5%	13.5%
<b>1</b>	24.3%	37.3%	28.2%
<b>2</b>	4.0%	21.2%	28.2%
<b>3+</b>	0.4%	10.1%	30.1%

### Why hasn't it been an issue in the past?

The evolution of digital media in education has gradually seen the increase of screen size, screen luminance and the time allocated to its use. Due to the great range of digital media devices available, the following data is only a sample of device specifications. Not all of the notes are negative, but all are changes in the student's environment.

- Changing from CRTs to LCDs, plasmas and projectors has increased the refresh rate/ flash frequency, or dispensed with it entirely, this **decreases** the risk of an adverse reaction for students with photosensitivity.
- Changing from 30 inch (72cm) TV screens to 1.20 m IAW screens in the classroom has greatly increased the percentage retinal area stimulated by the image, this **increases** the risk for students with photosensitivity.
- Note: 1 nit = 1 candella per metre squared. Screen Luminance has increased from CRTs at about 90 nits, to desktop LCDs from 200-300 nits, to HDTVs from 450-1000 nits. IAWs start at around 250 nits, but their default settings are often higher. This increases the stimulative properties of the image, which **increases** the risk of adverse reactions for students with photosensitivity.
- Laptops are (by design) operated close to the user, thus increasing percentage retinal area stimulated by the image. Again this **increases** the risk of adverse reaction for students with photosensitivity.
- More than half the school day can be spent with these devices "on" in the classroom, even if they are not the immediate focus of the current learning experience. This peripheral stimulus for hours during the day can have a **cumulative** adverse effect on students with photosensitivity.

Visual environmental triggers, such as those mentioned above, may have their risk level decreased by changes in luminance, contrast, additional natural lighting and being turned off while not in use.

Strategies suggested for students with diagnosed photosensitivity (or photophobia) are discussed in Chapter 10.

## Chapter 10. Strategies

This chapter is fairly blunt and to the point. If you want more details on the background of the strategies, read Chapter 6 in the parent section. The following practical strategies are designed to support students who have been diagnosed with photosensitivity. Australian classrooms have an abundance of natural light for a large part of the school year, so this resource is utilised. (Some medical journals suggest avoiding all stimuli – this is not practical in our classrooms, as most classrooms use some form of digital media.) Students trying to track the cause of headaches/sore eyes will also be asked about hydration and nutrition, to determine if that could be the cause of discomfort.

These strategies do not eliminate the risk, but decrease it, to alleviate the daily pressure. Ironically, some of the strategies are the reverse of what we could do to refocus a student who was ‘vaguely out’ or ‘not concentrating’.

1. Sit next to a window
2. Sit up the back in classes with IAWs
3. Use a pirate eyepatch with computer or IAW (this one is very student dependent about whether they are willing to try it)
4. a) decrease luminance on computer (and IAW if possible)  
b) decrease contrast ratio on computer (and IAW if possible)
5. Work in sessions less than 45 minutes on the computer or IAW, then take a break of 15 minutes
6. Avoid the colour saturated red
7. Avoid stripey moving images
8. Wear a peaked cap inside
9. Wear blue or grey tinted sunglasses inside
10. Get enough sleep

Different students have different brains and different eyes, and so will respond differently to strategies. Perseverance and documentation are once

again your best friends until you and your student find the best combinations to help everyone work effectively in class.

My personal preferences are 1 and 2 even today. When you find something that works, stick to it.

Chapter 11 has forms for reproduction to help speed things up in class for you. They have been created with input from optometrists, GPs and neurologists. All of these professionals explain that the more data presented on examination, the easier it is to find the next step in a diagnosis.

Finally, if you have five minutes to spare, please let other teachers/education assistants know what has worked/not worked online ([www.photosensitivity.info](http://www.photosensitivity.info)). This website is the partner to this book, and was created as a resource hub for those aware of photosensitivity, and those wanting to support their children and students.

## Chapter 11. Diaries and Observation Records

These types of records can be useful for identifying patterns in triggers and treatments

<b>Teacher Observation Record</b> <b>Student:</b>	Time: Date: Day:
--	------------------------

Teacher:

Class/Year:

Behaviour Change Noticed:

Environment			
Lighting:	<input type="radio"/> Medium sunlight	<input type="radio"/> Fluorescent	<input type="radio"/> No artificial lights
	<input type="radio"/> Bright sunlight	<input type="radio"/> Down lights	<input type="radio"/> Other _____
Seating position in class:	<input type="radio"/> Front	<input type="radio"/> Near window	<input type="radio"/> On Floor
	<input type="radio"/> Middle	<input type="radio"/> Not near window	<input type="radio"/> Other _____
	<input type="radio"/> Back		
Other Information:			
Activity			
Before Noticed Behaviour:			
After Noticed Behaviour:			
Other Information:			

Has this happened before: Yes/No

If yes, has it been (circle one) once, 2-5 times, 6+ times ?

Other comments/possible contributing factors:

Recommend 4 copies: teacher, student records, parent, doctor

## Teacher Checklist of What Helps (and what doesn't)



































































(One matrix, two students → two colors)

1. Student Name:

Colour:

2. Student Name:

Colour:

No	Tip	Help	Unsure	No Help
1	Window	  	? ? ?	  
2	Back	  	? ? ?	  
3	Eyepatch	  	? ? ?	  
4a	Luminance down	  	? ? ?	  
4b	Contrast down	  	? ? ?	  
5	45 min only	  	? ? ?	  
6	No dark red	  	? ? ?	  
7	No stripey moving patterns	  	? ? ?	  
8	Cap	  	? ? ?	  
9	Tinted sunglasses	  	? ? ?	  
10	Enough sleep	  	? ? ?	  

## Strategy Support Comments

1. Student Name:

Colour:

eg: Wed 16/5 Hat was too itchy, so removed. Worked well up the back

Fri 18/5 Completed all Read<sup>g</sup> Comp seated at back

Mon 21/5 Nothing working, can't sit still. (Drank Coke at lunch).

2. Student Name:

Colour:

## Glossary

<b>ACER Australian Council of Educational Research</b>	Australian Government body responsible for production of educational databases such as <i>A+ Education</i> which focus on journals from Australia
<b>Acute illness</b>	Illness with sudden onset, sharp rise, short course. (Merriam-Webster, 2013)
<b>AED anti epileptic drugs</b>	Pharmacological interventions used to decrease clinical manifestations of excess brain activity
<b>chromatic sensitivity</b>	A form of photosensitivity, specific to colour
<b>Chronic illness</b>	An illness that is prolonged in duration, does not often resolve spontaneously, and is rarely cured completely. <a href="http://www.health.gov.au/internet/main/publishing.nsf/Content/chronic#def">http://www.health.gov.au/internet/main/publishing.nsf/Content/chronic#def</a>
<b>clinical symptoms</b>	Visible, observable symptoms in addition to registering on EEG
<b>contrast</b>	Ratio of screen luminance of lightest colour (white): darkest colour (black).
<b>cortex (cerebral)</b>	Outer layer of brain, from which electrical measurement is possible with externally placed electrodes during EEG.
<b>digital media</b>	Screen based technologies eg computers, iPads, IAW
<b>EEG electroencephalogr aph</b>	An apparatus for detecting and recording brain waves (Merriam-Webster, 2013)
<b>epilepsy</b>	Chronic neurological condition characterized by recurrent excessive neuronal activity in the brain (Engel J Jr, International League Against Epilepsy (ILAE), 2001)
<b>epileptiform</b>	Resembling that of epilepsy (Merriam-Webster, 2013)
<b>ERIC Educational Resources Information Center</b>	American Education database equivalent in purpose to the Australian <i>A+ Education</i> database
<b>headache</b>	Pain located above the eyeline (Kasteleijn Nolst Trenite et al., 2010)
<b>hyperexcitability</b>	The state or condition of being unusually or excessively excitable (Merriam-Webster, 2013)
<b>IAW Interactive Whiteboard</b>	A large touch-sensitive board connected to a computer and a digital projector, used for teaching in the classroom (Collins Dictionary, 2013). Also called Smartboard.

<b>IPS</b>	A form of visual stimulation using an external light source flashing at predetermined frequencies. Sometimes used during EEG monitoring to determine stimulus frequencies for photosensitivity
<b>intermittent photic stimulation</b>	
<b>luminance</b>	A measure (in candelas per square metre) of the brightness of a point on a surface that is radiating or reflecting light. (Collins Dictionary, 2013).
<b>MEDLINE</b>	Medical database, provides access to a group of medical journals
<b>migraine</b>	Recurrent headache disorder. In children the attacks can last from 1-72 hours. (Olesen, Headache Classification Subcommittee of the International Headache Society, 2004)
<b>neural</b>	Relating to, or affecting a nerve or the nervous system (Merriam-Webster, 2013)
<b>neurological</b>	To do with the structure, function and diseases of the nervous system (Merriam-Webster, 2013)
<b>neurophysiological</b>	To do with the physiology of the nervous system (Merriam-Webster, 2013)
<b>occipital</b>	Section of the brain involved with vision
<b>physiology</b>	a branch of biology that deals with the functions and activities of life or of living matter (as organs, tissues, or cells) and of the physical and chemical phenomena involved; the organic processes and phenomena of an organism or any of its parts or of a particular bodily process (Merriam-Webster, 2013)
<b>PubMed</b>	Medical database, provides access to a group of medical journals
<b>photosensitive</b>	Visually sensitive, displays an epileptic reaction to visual light stimuli (Kasteleijn-Nolst Trenite et al, 2010)
<b>PPR</b>	Specific 'spike and wave ' pattern on EEG graph during IPS, used in diagnosis of photosensitivity (Kasteleijn-Nolst Trenite et al, 2010; Waltz, Christen & Dooze, 1992)
<b>photoparoxysmal response</b>	
<b>subclinical</b>	The appearance of spikes in EEGs of non-epileptic students has been interpreted as an excessive neuronal discharge which is limited within the brain and does not externally express itself.
<b>TCI</b>	A self-limiting momentary decrease in cognitive ability
<b>transitory cognitive impairment</b>	
<b>visual sensitivity</b>	Abnormal sensitivity to light stimuli (Verotti et al., 2005)

## References

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## *Photosensitivity: A seat up the back near the window, please.*

A practical, easy to read handbook designed to support students, parents and teachers who work with digital media in the classroom.

**The student section** is written and illustrated for Primary aged students. It introduces the idea of 'super electric brains' and 'exceptional eyeballs'. Top tips to try at school are explained, and a checklist included for record keeping of strategies that do (and don't) work.

**The parent section** provides some explanations, definitions and suggested avenues for support. It also introduces some of the medical literature that generated the strategies to use in the classroom.

**The teacher section** expands on the impact of high luminance and high contrast digital media, and why sitting up the back of the classroom can be helpful for some students. It describes how Transitory Cognitive Impairment can impact learning, and how to decrease this risk for students with photosensitivity. Templates for observation records are included.

The book is partnered by a website ([www.photosensitivity.info](http://www.photosensitivity.info)) which aims to alert parents to any update in policies, and other changes pertinent to the support of a student with photosensitivity.

### Disclaimer

#### No advice

While this document contains information regarding physical conditions and treatments, it is not advice, it does not provide medical advice and is not intended to be a substitute for professional medical advice. The reader should always consult their doctor or other professional healthcare provider to determine the appropriateness of the information for their own situation or purposes.

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