The Fluorescent Light Crisis: Part II: Properties and Environment Impact
By Joan Hudson-Miler, President, LRS Large Print and NAASLN Board Member

Introduction

In the June issue of the ***NAASLN Membership News and Views,*** Part I of this article, *Background, Overview and Action*, provided an overview of the physiological effects of fluorescent lighting and the controversies brewing from the international movement to eliminate incandescent lighting for the sake of energy conservation. As with so many crises, a short-term quick fix is not a long-term solution; it can, in fact, cause more problems than it solves. In the case of fluorescent lighting, there are serious environment concerns involving toxic chemical components that go beyond the issues addressed in Part I.

It is generally understood that the older style of fluorescent tube lighting, which is still used in many buildings, has been and continues to be a serious problem for many individuals with visual perception and disabilities. But what about the new compact fluorescent bulbs? CFLs are being recommended for home use for the sake of energy savings. How do they compare to energy-saving incandescent bulbs? And what about CRT computer monitors alone and in combination with overhead fluorescent lights? As professionals, we must understand more about the properties of CFLs, as well as their effects on individuals and the environment. We need more information on the properties of all of these types of lighting and their physiological and environmental impacts.

This single article will not provide all the answers, but instead should initiate a better understanding of an issue that affects all of us, especially within the realm of adults with special leaning needs. Because of the focus on global warming and the energy crisis, the international move to ban incandescent lighting pressures us to learn as much as we can. We need first to educate ourselves and then share this information. We need to include what we have learned in accommodations for our students by incorporating the fluorescent issue and light sensitivity into any education plan, needs assessment, or diagnosis. We need to be aware of our state's or district's policies. Finally we must encourage our legislators to halt the total ban on incandescent lighting until all the components of the complicated issue are better understood.

So let's get going. My goal is to get you started down the information highway by providing links to several experts. As with any journey, once you start, you choose your own destination depending on your own personal needs and those of your students or clients. You can stop with the first links or continue down side roads or major thoroughfares. And as you make new discoveries, gather new information, form opinions about how best to accommodate, and determine what actions need to be taken, I would ask that you send us an email at info@naasln.org and we will compile and share with the NAASLN community and others.

A better understanding of fluorescent lighting

Cool white or warm white fluorescent lighting – What is this? What are the differences between fluorescent, halogen, neodymium and regular incandescent light bulbs? What do they mean by labels such as “full spectrum” and “daylight” and “blue light”? To answer this question, I turn to the experts, Elaine Kitchel, M.Ed., research scientist, The American Printing House for Blind; Dan Roberts, founding director Macular Degeneration Support; and Helen Irlen, MA, LMFT, executive director, Irlen Institute.

Elaine Kitchel recently admitted, “this is my favorite subject.” We highlight three of her articles, which are an accumulation of her exhaustive research into the issue of lighting from the perspective of pre-exisiting eye pathologies. She also takes into consideration other physiological conditions, such as epilepsy, migraines, light sensitivity, and extensive time spent in environments using this type of lighting. These articles include extensive bibliographies of research, and resources.

In her article, *The Effects of Blue Light on Ocular Health*, Ms. Kitchel points out the following:

> For years now, professionals in the fields of light energy and vision have known about the hazards ultraviolet (UV) light presents to ocular health. We are gradually having longer and more intense exposures to blue light; much of the world of commercial display and industry is lit with cool white fluorescent tubes, which emit a strong spike of light in the blue range. Indeed many homes and offices are lit with cool white fluorescent tubes. No one doubts more people are spending time in front of video display terminals (VDTs) which produce blue light. While some people find blue light irritates their eyes or causes headache, most are able to ignore it. Scientists only now are beginning to investigate its long-term effects and offer some solutions for maintaining ocular health in the presence of blue light.

Ms. Kitchel continues to define and explain blue light and what can be done to screen out the negative effects for individuals forced to work and study in environments using fluorescent lighting. Click here to read the full article.

In her second article, *The Effects of Fluorescent Light on the Ocular Health of Persons with Pre-Existing Eye Pathologies,* Ms. Kitchel focuses on the classroom setting because “most schools are lit with cool white fluorescent tubes as well….However, recent studies in cellular activity of the human retina indicate

cool white tubes or daylight tubes should probably not be considered as a good lighting source for persons with eye disease or eye injury." Why is this so? Click here to read whole article.

In her third article, *Light and Low Vision*, Ms Kitchel focuses on the effects of light on individuals with visual impairments. She notes that "for years it has been know that persons with visual impairments need three times as much light, in general, to do the same task as a person with normal vision." The type of light, however, must be taken into consideration. Ms Kitchel helps us understand the basics of the properties of light in simple terms that we can all understand and the effects of the various types of lighting on the visually impaired. Click here to read whole article.

In an analysis of what kind of lighting is best for people with retinal diseases, such as macular degeneration, Dan Roberts, founding director of Macular Degeneration Support, has provided an in depth explanation about light in general and then explains the differences between fluorescent, halogen, neodymium, and regular incandescent light bulbs. Click here to see full article: www.mdsupport.org/library/hazard.html.

A global perspective on the adverse effects of fluorescent lighting on the general population

Helen Irlen provides an international perspective on the adverse effects of fluorescent lighting on the general population. Long-term clinical studies by the Irlen Institute with those with reading difficulties have found that many reading difficulties and academic underachievement are related to fluorescent lighting. In fact for 12-14 percent of the world's population, fluorescent lighting may trigger physical and emotional symptoms, such as headaches, migraines, nausea, dyslexia, ADD/HD, and stress. In the United States this percentage represents about 40 million people. In her article, *Fluorescent Lighting Can Trigger ADD/HD, Dyslexia, and Poor Achievement,* Ms. Irlen helps us understand what all this really means with a report of several studies and personal stories of children and adults, who have been adversely affected by fluorescent lighting. Click here to read whole article. For more information about the work of the Irlen Institute and the use of colored filters and overlays to alleviate the negative effects of fluorescent lighting go to www.irlen.com.

Fluorescent light and its impact on the environment

The actual environmental impact of CFLs is the subject of much debate. Apart from the gross electrical power saved during operation, the amount of power and raw materials used in their manufacture poses its own questions. Of particular concern is whether the mercury used in CFLs is a significant environmental hazard.

The Internet, of course, offers vast resources. Wikipedia has an extensive section on the CFL, which incorporates much of what I have been finding on my searches. See en.wikipedia.org/wiki/Compact_fluorescent_lamp#Comparison_with_incandescent_lamps.

NEMA, the National Electrical Manufacturers Association (www.nema.org) has published *Fluorescent Lamps and the Environment*, which is downloadable at no charge. See www.nema.org/stds/lamps-env.cfm#download.

I encourage you to review all of this information, including the latest on the environment impact and mercury levels of new and old fluorescent bulbs.

Conclusion

As with so much in life that sustains us, light is a complex phenomenon. Artificial lighting is no different. Because of the extensive variable nature of the physiological needs of each of us, there must always be options. "One size fits all" doesn't work in any aspect of our lives – so it can't with artificial lighting. As professionals working with adult learners, appropriate lighting is essential to success. We personally must have an indepth understanding of the properties of each type of lighting and ensure that a variety of types are always available. We are, of course, also concerned about energy-efficiency. But the focus must be on making each type of lighting as efficient as possible and eliminating or reducing the negative effects of lighting

Become informed and take action. Remember to share with us your discoveries, opinions, and practical accommodations with an email to info@naasln.org.

The impact of your actions will change your life, as well as that of your students, clients, and generations to come.