



Science and Technology Resources on the Internet

Vision Science Resources on the Web

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Introduction

For individuals fortunate enough to have healthy eyes and clear vision, imagining a world without sight can seem impossible. Optometrists and ophthalmologists primarily perform the study of vision science, but knowledge about vision is applicable to many non-professionals as well. When the general population needs glasses, contact lenses, or eye drops, they are modifying their vision or treating their eye health. For those who are afflicted with blindness, low vision, or conditions such as glaucoma or cataracts, vision science is essential for helping them in their daily lives. Even for those unaffected by eye disease, keeping up with new research on eye health, such as the effects of blue light from digital screens, or the eye strain of looking at a computer monitor for upwards of eight hours a day, can be important for the general population's eye health.

Scope

The target audience for this vision science webliography includes students studying ophthalmology or optometry, consumers searching for reliable vision information, eye-care professionals, and librarians in need of a curated list of web resources. This webliography consists of open access journals, reputable websites such as professional organizations and government pages, eye and vision statistics, and online reference material. The webliography is not meant to be a comprehensive list of all vision science resources on the internet, because the scope of information is far too vast to be listed in one place. Instead, the authors have selected

the highest quality and most relevant vision science resources while also making an effort to include as many different subjects as possible.

Methods

To produce this webliography, the authors looked at the Association of Vision Science Librarians (AVSL) website (<https://www.avsl.org>), as well as the subject guides of optometry and ophthalmology libraries. The list of open access journals on the AVSL website were reviewed for legitimacy, and the AVSL whitelist was used to verify the journals. The statistical websites were obtained from government sources or other reputable sources. The websites were reviewed by the authors and were chosen based on the source of the information, accessibility of the website, the currency of the information, and the relevance of the information. Resources were also limited to English language websites that are freely accessible.

Open Access Journals

BMC Ophthalmology

<https://bmcophthalmol.biomedcentral.com/>

Available through the open access BioMed Central database, BMC Ophthalmology is peer-reviewed and affiliated with the Cochrane Eye and Vision group. The journal's archives date back to 2001.

British Journal of Ophthalmology

<https://bjournal.bmj.com/content/by/year/>

This journal's full-text archives go back to 1917, and articles earlier than 2006 are freely available online.

Case Reports in Ophthalmology

<https://www.karger.com/Journal/Home/251887/>

As its name suggests, this journal focuses on case reports. The journal also encourages the submission of negative results.

Community Eye Health Journal

<https://www.cehjournal.org/>

This international journal primarily targets low and middle-income countries who may have little or no access to other current vision health information.

Digital Journal of Ophthalmology

<http://www.djo.harvard.edu/>

This journal is published by the Massachusetts Eye and Ear Infirmary, a teaching hospital of Harvard Medical School. In addition to articles, the journal also offers images, grand rounds, and case reports.

Indian Journal of Ophthalmology

<http://www.ijo.in/>

This journal is published by the All India Ophthalmological Society and includes a section for "Most Popular" and "Most Cited" articles.

International Journal of Ophthalmology

<http://www.ijo.cn/gjyken/ch/index.aspx>

This journal, based in China, has an English and a Chinese version. It is included in the Directory of Open Access Journals (DOAJ) and has been published since 2008.

Investigative Ophthalmology and Visual Science

<http://iovs.arvojournals.org/>

Published by the Association for Research in Vision and Ophthalmology (ARVO) since 1962, IOVS emphasizes clinical and laboratory-based research.

Journal of Academic Ophthalmology

<https://www.thieme-connect.com/products/ejournals/journal/10.1055/s-00033285>

This journal focuses on the advancement of ophthalmic education and would be useful for educators.

Journal of Ophthalmic and Vision Research (JOVR)

<http://www.jovr.org/>

The journal is the official publication of the Ophthalmic Research Center, which is the first Iranian eye research center. JOVR is published through Wolters Kluwer Health and is indexed in Web of Science, SCOPUS, and PubMed Central.

Journal of Ophthalmology

<https://www.hindawi.com/journals/joph/>

Published by Hindawi and indexed in the DOAJ, this journal focuses on new diagnostic and surgical techniques.

Journal of Vision

<http://jov.arvojournals.org/>

This journal is published by ARVO from 2001 to present. The content is indexed in MEDLINE and available in PubMed. Additionally, images within articles can be downloaded as PowerPoint slides with corresponding captions and copyright information.

Molecular Vision

<http://www.molvis.org/molvis/>

Published since 1995, Molecular Vision has a focus on molecular and cell biology in relation to the genetics of the visual system.

Ocular Surgery News

<https://www.healio.com/ophthalmology?pid=osn>

This magazine, published by Healio, includes the latest vision science news, information videos, opinion articles, and instructional columns.

Optometric Education

<https://journal.opted.org/>

Optometric Education is the official journal of the Association of Schools and Colleges of Optometry and has been published since 1975. This peer-reviewed journal is intended for optometric educators, students, practitioners, and others in healthcare education.

Review of Ophthalmology

<https://www.reviewofophthalmology.com/archive>

This journal contains reviews of current research, a job board, and continuing education options for professionals. The journal archives date back to 2003.

Transactions of the American Ophthalmological Society

<https://www.aonline.org/resources/transactions/>

The American Ophthalmological Society was founded in 1864 and requires members to submit a thesis, which is then published on their website. The entire archive is available on PubMed Central.

Translational Vision Science & Technology

<http://tvst.arvojournals.org/>

This ARVO journal looks at high-tech solutions, including nanotechnology, tissue bioengineering, stem cell technology, and more.

Professional Associations and Government Websites

American Academy of Ophthalmology (AAO)

<https://www.aaopt.org/>

The AAO is the largest eye physician and surgeon association in the world. The website contains industry news, continuing education modules, and practice management classes. Additionally, AAO hosts the largest annual meeting for ophthalmologists and publishes four professional publications: *EyeNet*, *Ophthalmology*, *Ophthalmology Glaucoma*, and *Ophthalmology Retina*.

American Optometric Association (AOA)

<https://www.aoa.org/>

The AOA is the professional organization for optometrists in the United States. Their website offers information about the organization, annual meetings, information for patients, eye-care tips, and other eye information for the general public and for practitioners. There is also information and continuing education options for paraoptometric professionals and optometric staff.

The Association for Research in Vision and Ophthalmology (ARVO)

<https://www.arvo.org/>

ARVO is an association of vision researchers, with over 12,000 members from over 75 countries. The association publishes three well-respected journals: *Investigative Ophthalmology and Visual Science*, *Journal of Vision*, and *Translational Vision Science & Technology*. ARVO also hosts one of the largest vision-related annual conferences and is one of most influential organizations in the vision sphere.

Association of Vision Science Librarians (AVSL)

<http://www.avsl.org/>

AVSL is “an international organization composed of professional librarians, or persons acting in that capacity, whose collections and services include the literature of vision”. AVSL is celebrating their 50th year of existence, and has recently published an in-progress “whitelist” of trusted vision journals, due to the increasing number of predatory journals related to optometry and ophthalmology.

MedlinePlus: Eyes and Vision Topics

<https://medlineplus.gov/eyesandvision.html>

This National Library of Medicine (NLM) resource consists of links to a number of MEDLINE search results, NLM and other government resources, and a host of English and Spanish resources, all arranged by category. The information is organized in a way that is easily accessible for patients and consumers and is written in an understandable and digestible style.

National Eye Institute (NEI)

<https://www.nei.nih.gov/>

Part of the National Institutes of Health, the NEI is at the forefront of eye research in the United States. Their website includes news items, an image library, funding availability, and links to many free pamphlets and booklets for patients, people at risk, and the general public. Topics include: age-related macular degeneration, cataracts, diabetic retinopathy, and glaucoma.

Vision 2020

<http://www.vision2020.org/>

Vision 2020 is an initiative for the elimination of avoidable blindness by the World Health Organization (WHO) and the International Agency for the Prevention of Blindness. The goal of the initiative is to reduce and eventually eradicate preventable blindness and vision problems in developing countries around the world.

Resources for Consumers

All About Vision

<https://www.allaboutvision.com/>

The website helps users find eye doctors and also provides information on glasses, contact lenses, and vision insurance. The website's goal is to give consumers unbiased information on eye health and vision correction and to provide them with different treatment options. This site is intended for those who are unfamiliar with the benefits of optometric care.

InfantSEE

<https://www.infantsee.org/>

InfantSEE is a public health program for infants by members of the AOA in partnership with Johnson & Johnson Vision. The program advocates for eye exams for young children and includes information on how to find a healthcare provider nearby that offers infant vision screenings.

Macular Degeneration Partnership

<http://www.ucirvineamd.org/>

The Macular Degeneration Partnership, through University of California, Irvine's Gavin Herbert Eye Institute, provides outreach to those affected by age-related macular degeneration. They offer support groups, newsletters, and information on how to change your lifestyle to help deal with the effects of this condition. The website features reports about new clinical trials and experimental treatments.

The Merck Manual's Online Medical Library Eye Disorders (Consumer Version)

<https://www.merckmanuals.com/home/eye-disorders>

The Merck Manual's consumer version includes eye disorder-related information that is

accessible for non-medical professionals. The reference materials include videos, 3-D models, and quizzes. Each entry also allows the reader to toggle between quick facts and the full entry.

The Silver Book: Vision Loss

<https://www.silverbook.org/VisionLoss>

The Vision Loss section of the Silver Book is an almanac of facts, statistics, graphs, and data. This searchable database, produced and updated by the Alliance for Aging Research, provides free information for those affected by eye diseases such as diabetic retinopathy. Some information is also available in Spanish.

Sports Vision

<https://www.aoa.org/optometrists/membership/aoa-sections/sports-vision-section/sports-and-vision-guidebooks>

This resource, available through the AOA website, has vision information related to baseball, hockey, motocross, and rugby. Each sport has sections on visual training techniques, solutions for potential vision problems, recommended eyewear, and common injuries. This site would be useful for athletes participating in these sports, their parents, or eye-care practitioners who want to treat these types of patients.

Vision Therapy

<https://www.visiontherapy.org/>

Vision therapy is a way of training the eyes to become stronger. Visiontherapy.org describes it as “physical therapy for the eyes”. This website offers videos, links to optometrists who provide vision therapy, and information for parents. Vision Therapy is part of the Optometrists Network, which focuses on patient information related to vision.

Web Accessibility in Mind (WebAIM)

<https://webaim.org/>

WebAIM works to make web content accessible for people with disabilities. In terms of vision, this means that websites should be easy to read for people with low vision or color deficiencies. WebAIM offers helpful tools, such as keyboard shortcuts, as well as simulations of low vision, dyslexia, and screen readers. The site also offers training and certification in web accessibility.

Resources for Clinicians

Cochrane Eyes and Vision

<https://eyes.cochrane.org/>

Cochrane Eyes and Vision is a section of the Cochrane Collaboration that works on systematic reviews on topics related to eye diseases, diagnostic tests, and visual impairment. These reviews help eye care professionals provide the best evidence-based care to their patients. This international group of researchers also works to promote and disseminate their research.

Compendium of Evidence-Based Eye Care

<https://www.aoa.org/guidelines-browse?filter=compediumonly>

This site, created by the AAO, has almost 200 eye care guidelines. These guidelines summarize research findings and offer recommendations for care. Each guideline also provides a link to the literature search that was performed to find the relevant research, and can be used to help ophthalmologists give updated, evidence-based care to their patients.

Eyedock

<https://www.eyedock.com/>

This website, started and operated by two practicing optometrists, was established in 2002 and features a large searchable database of contact lens parameters. While some of the content is behind a paywall, users can perform searches for various types of contact lenses for free. The site also features contact lens-specific calculators.

The Merck Manual's Online Medical Library Eye Disorders (Professional Version)

<https://www.merckmanuals.com/professional/eye-disorders>

The Merck Manual provides medical reference information on eye disorders. The resource includes videos, patient education information, as well as information on indications, contraindications, and complications. This website is best for professionals who need a point-of-care resource that they can consult quickly while treating patients.

Optometric Clinical Practice Guidelines

<https://www.aoa.org/optometrists/tools-and-resources/clinical-care-publications/clinical-practice-guidelines?sso=y>

The AOA provides evidence-based guidelines for the care of optometric patients, both those with eye disease and those who need a comprehensive eye exam. The guidelines currently listed include care of the patient with diabetes mellitus, adult eye and vision examination, and pediatric eye and vision examination. AOA also includes consensus-based guidelines for a variety of diseases, and these guidelines are currently in the process of being revised.

Resources for Vision Science Students

Anatomy, Physiology & Pathology of the Human Eye

http://www.tedmontgomery.com/the_eye/

Maintained by Ted M. Montgomery, OD, for more than 20 years, this website includes a variety of eye information. In addition to detailed sections on eye anatomy, such as conjunctiva, iris, cornea, and optic nerve, the website also includes quizzes, a glossary, photos, and color vision tests. While an older website, it is still well-maintained and has quality information and images.

Cybersight

<https://cybersight.org/portfolio/>

Cybersight is a telemedicine website that offers advanced online training to eye-care practitioners in developing countries. Content includes surgical videos, lectures, quizzes, and textbooks. Recordings and slides can be downloaded, and all content is free. The goal of the site is to increase the quality and availability of eye-care training in countries that do not have the infrastructure in place to offer this type of instruction.

Digital Reference of Ophthalmology

<https://dro.hs.columbia.edu/>

This educational resource, through the Columbia University Department of Ophthalmology, contains high quality images and text covering oculoplastics, cornea and external diseases, glaucoma, lens and cataract, vitreous and retina, neuro-ophthalmology, and pediatric and strabismus. Clinical features are listed for each disease, including symptoms and signs, as well as related conditions that may cause complications.

Eye and Vision Statistics

Center for Disease Control (CDC) Vision Health Initiative Statistics

<https://www.cdc.gov/visionhealth/data/index.html>

This initiative lets users track vision and eye health data by location and topic and also includes a portal with access to datasets and maps. The CDC uses five national surveys to collect information about vision health and then synthesizes those responses into their health initiative statistics.

Prevention of Blindness and Visual Impairment Data Maps

https://www.who.int/blindness/data_maps/en/index.html

The WHO hosts global data on vision impairment. The latest edition from 2010 includes 53 surveys from 39 countries and tracks the prevalence and causes of various types of vision impairment. The data have been organized into separate documents and are helpfully displayed in readable charts and graphs.

Statistics and Data, National Eye Institute

<https://www.nei.nih.gov/eyedata/>

The NEI obtained data from major studies and then combined this information into a meta-analysis. Prevalence rates for various eye-related diseases (such as age-related macular degeneration, blindness, cataracts, glaucoma, and myopia) were made based on age, race, and sex. The information is shown in graph form and also in detailed tables. The NEI also included projections for disease rates in 2030 and 2050.

Statistical Snapshots from the American Foundation for the Blind

<https://www.afb.org/info/blindness-statistics/2>

These statistics, updated regularly, show the rates of blindness and visual impairment among children, students, adults, and seniors in the United States. The site also includes state-specific statistics, as well as employment statistics. The information is intended for patients and includes a glossary of vision terms and statistical terms.

Vision Problems in the United States

<http://www.visionproblemsus.org/>

This website helpfully breaks down the prevalence of different types of vision problems by state. The estimates were created by using a variety of epidemiological studies and the most current version of the United States census. Each state has an estimate of various eye diseases based on sex and race for adults aged 40 and older (or 50 and older for age-related macular degeneration). While the authors admit that the numbers are not exact, they are the closest estimates they could produce with the information available.



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