The Indiana University School of Optometry Pediatrics/Binocular Vision Service

The Indiana University (IU) School of Optometry has an active Pediatric and Binocular Vision (Peds/BV) clinic, training optometry students and providing care to patients ranging in age from infants in the first weeks of life to aged patients with binocular vision and neurological problems. The School of Optometry has five clinics in which eye and vision care is provided (Bloomington campus clinic, Bloomington Community Eye Care Center, Indianapolis Eye Care Center, IU Eye at Carmel (Indiana), and the Guanajuato Eye Care Center in Guanajuato, Mexico). Dr. Don Lyon is the Director of the Peds/BV clinical program, coordinates the school screening program, and oversees the pediatric residency program. Other faculty members in this Service include Drs. Rowan Candy, David Goss, Douglas Horner, and Mrs. Andrya Lowther.

Recent and Current Activities

Vision therapy has been an integral part of the optometry clinic services at Indiana University since the clinic opened in 1955.1 It has expanded considerably in the last few years. Four years ago the Bloomington campus clinic was remodeled adding an area of the clinic dedicated to pediatrics and binocular vision with a reception area and examination rooms designed for children as well as a training room. This has resulted in a growth of our service to children as well as others with binocular vision, visual processing and learning problems.

An infant vision clinic was started four years ago by Rowan Candy to give our students more experience examining infants. She examines infants as young as three to four weeks with the students in our Bloomington and Indianapolis clinics. The patients are referrals as well as patients from our clinics. In addition to the usual testing procedures for infants, she uses Visual Evoked Potentials and eccentric photorefraction technology to determine the functioning of the visual system of normal and non-responsive infants. She is also currently using these techniques in her research to study the immaturities in the infant visual system. The goal is to understand how infants’ visual systems are developing, from the eye to the brain, how well infants can see, and to determine which components of visual development are dependent on visual experience for normal development. She designs and utilizes sophisticated diagnostic instrumentation. Her research is supported by a grant from the National Eye Institute.

Optometry students examine a large number of preschool and first grade students in the School’s clinics. Examinations are provided to children in Headstart, First Steps, Well Baby Program and other children’s programs. Approximately 3,500 kindergarten and first grade students in the Bloomington area as well as over 1,000 in the Indianapolis area are screened each year. A large number of amblyopic patients are seen in the School’s clinics, in part due to Don Lyon’s research on the topic. He is a member of the Pediatric Eye Disease Investigator Group (PEDIG) and has carried out a number of Amblyopic Treatment Studies (ATS).

Working with the optometry students, Andrya Lowther, MS, diagnoses children with visual processing and learning problems, develops training programs and provides the therapeutic procedures. They work with not only the children and their parents but with many other professionals including those in local school systems.

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She often attends the case conferences as an advocate for the child and parents helping the school develop an appropriate educational program for the child. She also works with adults with learning or neurological problems.

Steve Hitzeman is the Clinic Director for all IU School of Optometry Clinics and is a nationally recognized expert in sports vision. Hitzeman utilizes vision therapy to enhance the visual skills of athletes at the high school, intercollegiate, and professional levels. He involves students in screening and testing the visual function of athletic teams. He takes students to work with athletes at the Amateur Athletic Union (AAU) Junior Olympic Games, Special Olympics and other events.

In addition to the normal patient care activities, the faculty is involved in clinical research, including research with local school systems. They were leaders working with the IU Department of Speech and Hearing on a multi-disciplinary research project with the Benton County Indiana Community Schools. More details on this significant project are given below. Recently some of the faculty have been working with the Jennings County (Indiana) Schools on a vision therapy research project training fourth grade students using the Home Therapy System (HTS) computer training system in the school setting. The School of Optometry is also a cooperating partner with the IU Pediatric Ophthalmology Department on an Indiana Lions Foundation photo-screening project targeting children from 18 months to four years of age.

The Peds/BV faculty and students present continuing education, research papers and posters at national and international meetings, and are active in vision therapy organizations such as COVD. Doug Horner and Andrya Lowther have made presentations at several meetings on the findings of the Benton-IU Study. David Goss received the COVD award for best journal article of the year in the Journal of Optometric Vision Development in 2003. He is on the editorial boards of the Journal of Optometric Vision Development and the Journal of Behavioral Optometry and was the first person to become a research fellow of COVD (FCOVD-R). Janice Ngan, fourth year optometry student, received the Martin Kane Student Research Award at the COVD meeting in Cancun for the outstanding research poster in the area of visual processing. Danielle Warren, IU’s 2004-05 resident, was the lead author with members of the faculty on a poster at the last American Academy of Optometry meeting. At the same meeting Rowan Candy had two posters, one on a video-based eccentric photorefractor and another with one of her graduate students comparing higher order ocular aberrations of infants five to seven weeks old to those of the infant’s parent. She also gave a course, “Why Can’t Babies See Well and When is Their Vision Abnormal.” Don Lyon presented a continuing education lecture entitled Pediatric Eye Disease: Benign to Blind.

The Benton-IU Project

In 1995, the Peds/BV group embarked on a large research project which has since been referred to as the Benton-IU Project. The project was initiated as a result of an inquiry from the Superintendent of the Benton Community School Corporation, Benton County, Indiana, Glenn Krueger, about the possible contributions of vision to the academic success of early elementary school students. The Peds/BV group partnered with the IU Department of Speech and Hearing to design a study protocol to investigate factors which influence early academic performance. In 1995-97, standardized eye, vision, auditory, perceptual, linguistic, intellectual, and cognitive tests were administered to 470 first grade children in the Benton County schools. There was a remarkable participation rate in that 96% of the children entering first grade in those years were tested. Children were bused to IU’s Indianapolis Eye Care Center for some of the testing and other testing was conducted at the schools in Benton County. Each child underwent about eight hours of testing in total. Children who were found to have need for glasses or treatment for ear problems were referred for care. In 1998-2000, the same three classes of children were tested again in fourth grade. Tests categorized as visual cognition tests were found to be one of the predictors of school performance in the first grade. Analysis of the results from the Benton-IU Project is continuing.
Residency Program

The Peds/BV group started a residency program in Pediatrics and Binocular Vision in 1999. The residency was accredited in 2003 and was renamed the Pediatric Optometry Residency. Residents engage in direct patient care at both Bloomington and Indianapolis clinics. The resident also consults with interns on patient encounters in Bloomington, and completes a research project. With the assistance of Dr. Candy infant vision plays an integral role in the residency program. By the end of the first couple of months the residents are able to accurately and efficiently perform comprehensive optometric examinations on infants. The residents also oversee school screenings of first graders throughout south central Indiana. Lecturing in didactic courses is highly recommended during the residency and there are many opportunities for the resident to lecture to different classes within the school. The residents also spend a portion of their time observing at the Indiana University’s Department of Pediatric Ophthalmology at Riley Children’s Hospital Outpatient Center. During these observations they are able to interact with pediatric ophthalmologists and gain more education in the area of pediatric eye disease.

The first Peds/BV resident, in 1999-2000, was Don Lyon. The resident in 2000-01 was David Rich, a member of the IU School of Optometry Class of 2000. After completing his residency, Rich entered practice in Atlanta, Georgia. After a year without a resident, the Peds/BV resident in 2002-03 was Joseph De Spirito, a graduate of Southern College of Optometry. De Spirito then entered practice in Bloomington. In 2003-04, the Peds/BV resident was Christy (Carlisle) Hohenbarry, who graduated from IU in 2003. Hohenbarry is practicing in Illinois. The resident for the 2004-05 was Danielle Warren, a graduate of Illinois College of Optometry. She has decided to continue her education and work towards a PhD under a K-12 grant to the IU School of Optometry. The resident for 2005-06 is Kate Gray.

Faculty

The current chief of the Pediatrics/Binocular Vision Service is Don W. Lyon, who entered optometry school at IU with a BA degree in psychology from IU. Lyon completed his Doctor of Optometry degree in 1999 and was IU’s first pediatric optometry resident in 1999-2000. After completing the residency, Dr. Lyon accepted a joint appointment as the Chief of Peds/BV Services at Indianapolis Eye Care Center for the IU School of Optometry and seeing patients in the Pediatric Section of the IU School of Medicine Department of Ophthalmology. In July of 2004, Don Lyon left his affiliation with the IU School of Medicine to become a full-time faculty member in the School of Optometry and Chief of the Peds/BV Service. He has been coordinating IU’s school vision screening program since his residency. He also oversees the Peds/BV residency program, and has worked on a number of nationwide studies on amblyopia.

Other faculty members in the Pediatrics/Binocular Vision group include T. Rowan Candy, David A. Goss, Douglas G. Horner, and Andrya Lowther. Coincidentally both Horner and Goss were members of the Pacific University College of Optometry Class of 1974. Their class experienced a strong curriculum in case analysis, vision therapy, and the background sciences for functional vision care, along with in-office vision therapy as a dominant component of their clinical experience.

After practicing optometry for a few years, Doug Horner completed MS and PhD degrees at the University of Houston and did post doctoral study at the University of California Berkeley. Horner joined the IU faculty in 1988. He has published on a number of topics, including corneal topography, contact lenses, refractive errors, vergence function, and international optometry. He has

Figure 2. Examination of an infant.

Figure 3. A student examining a child.
had various didactic instruction responsibilities at IU, including teaching ocular motility and strabismus.

David A. Goss joined the faculty at IU in 1992. After practicing briefly, Goss completed his PhD in physiological optics at IU, with Henry Hofstetter as his thesis advisor. He was on the faculty of Northeastern (Oklahoma) State University College of Optometry from 1980 to 1992. His research and teaching have primarily been in the areas of accommodation and vergence testing procedures, case analysis, myopia, refractive development, and optometric history.

An addition to the Peds/BV group in 1994 was Andrya Lowther. She earned bachelor’s and master’s degrees in education from The Ohio State University. She was a special education teacher for nine years, an instructor and educational consultant at Ferris State University College of Optometry for 11 years, and the clinical coordinator for adult learning disabilities in the University of Alabama Birmingham Program for Developmental Disabilities for four years. She provides patient work-ups and didactic instruction in visual information processing. She has published articles on visual information processing, and has made presentations to a variety of groups and organizations.

An infant vision researcher, T. Rowan Candy, joined the IU faculty in 2000. Candy completed optometry school at the University of Wales, Cardiff, in 1989. After practicing for two years, Candy studied at the University of California Berkeley, receiving her PhD in vision science in 1997. From 1997 to 2000, she did post doctoral research at the Smith-Kettlewell Eye Research Institute in San Francisco. She is directing a number of studies relating to the development of accommodation, refraction, and visual function in infants. In the clinic, Candy examines infants and children less than three years of age.

Comments
This has been just a brief description of some of the activities of the Indiana University School of Optometry Peds/BV Service. It is an active and growing clinical, didactic, and research program in pediatrics, binocular vision, and vision therapy. It seeks to continue to expand the services offered to children and the adults with ocular and vision problems; binocular vision disorders; and to train future optometrists to care for children of all ages. A history of instruction in vision therapy at Indiana University was recently published in the Fall, 2004 issue of the Indiana Journal of Optometry (on the web at www.opt.indiana.edu/IndJOpt/index.htm). More information about the School’s clinics, faculty and research is available on the web at www.opt.indiana.edu.

References