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Pacific University College of Optometry

EYE ON PACIFIC

As vision subspecialties continue to grow, we can ensure that patients continue to get the care they deserve.

Summer | 2016

Ocular Disease Consultations and Special Testing

LORNE YUDCOVITCH, OD, MS, FAAO | MEDICAL EYE CARE SERVICE CHIEF

Our clinical faculty are available for consultations and second opinions for your patients. In conjunction with professional consultations, we offer special testing and instrumentation to help diagnose and manage many conditions. Here I share an example of a patient who was referred for a second opinion and additional testing.

Case Report

A 43-year-old Caucasian male presented as a referral to the Pacific University Forest Grove Eye Clinic for further evaluation of a 'spot' on his right eye for the last 5 months, as well as a blurry spot in the inferior temporal field and intermittent eye pain in superior gaze when blinking. History included prior corneal foreign body (the patient was unsure as to which eye) and asthma, with a family history of cancer (the patient was unsure of the type of cancer).

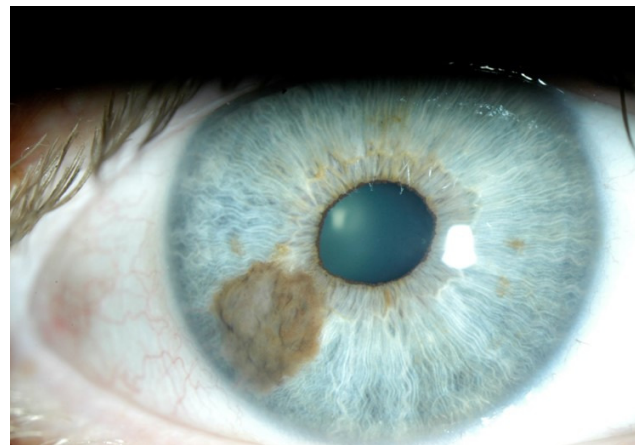


Figure 1: Iris mass on the patient's right eye

Medications included trazodone, lithium, Ventolin, albuterol sulfate inhaler, nicotine patch, and triamcinolone cream. The patient reported no medication allergies, and was a current alcohol drinker and smoker.

Ocular Disease Consult (continued)

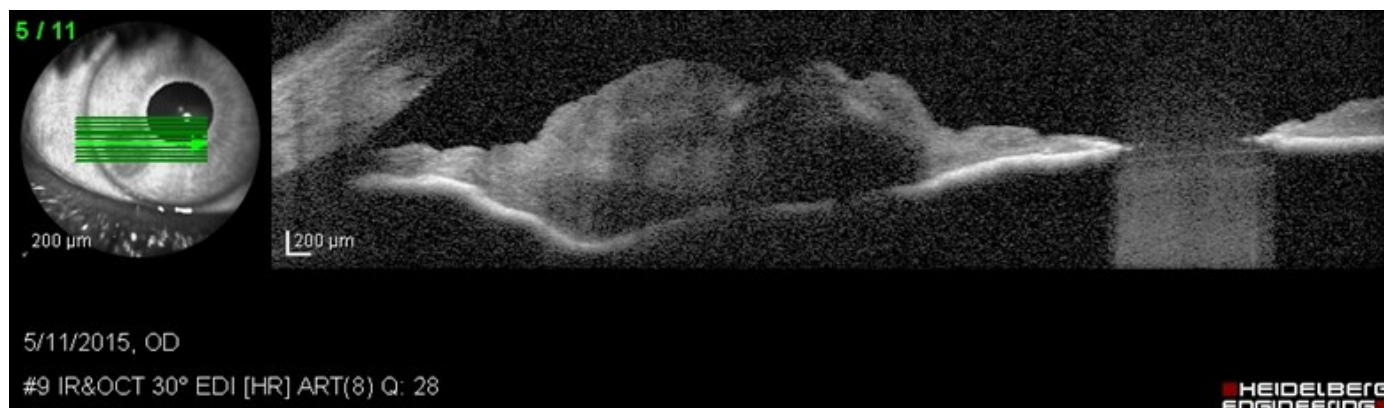


Figure 2: Spectral-domain anterior segment OCT cross section of the iris mass.

Unaided visual acuities were 20/15 in each eye. Pupils on general observation appeared round and reactive with no relative afferent pupil defect; however, closer observation revealed slight elongation of the right pupil from 1 o'clock to 7 o'clock. Ocular motilities were full and equal in both eyes, with no pain or diplopia noted. Ocular pressures were 14 OD, 15 OS at 8:55 AM.

General observation showed normal facial symmetry, with no atypical skin pigmentation nor lesions. Anterior segment biomicroscopy revealed a raised mass on the right iris at the 7 o'clock region, approximately 0.5mm from the pupil border (Figure 1). The 3.5mm x 3.5mm lesion appeared light brown in color and velvety in texture, with mild vascularization along the edge of the mass. No ectropion uveae was noted. Gonioscopy confirmed the elevation of the mass located near the pupillary ruff. Mild vasculature was noted in the angle at the 7 o'clock position. Otherwise a flat iris approach and visible ciliary body was seen in all quadrants. Dilated fundus examination performed two weeks prior by the referring doctor reported normal appearing vitreous, optic nerves, maculae, vasculature, and retina/choroid. The right optic nerve had mild glial tissue along the inferior-nasal rim.

Spectral-domain anterior segment optical coherence tomography (OCT) was performed on several sections of the iris mass, showing notable (over 1mm) thickening anteriorly as well as posteriorly, with minimal hyporeflectivity or cavitation seen (Figure 2). The lesion appeared to be localized to the iris, without extension in to the ciliary body or angle. B-scan ultrasound using both low and high gain showed no other apparent abnormalities in the globe (Figure 3).



Figure 3: B-scan ultrasound of patient's right eye, showing no apparent abnormalities.

Ocular Disease Consult (continued)



Figure 4: Age 18 self-portrait (magnified). Despite the reduced quality of the magnified image, the pigmentation of right iris is visible at 7 o'clock.

Upon original request by the referring doctor, the patient produced a self-portrait photograph taken at age 18 for comparison (Figure 4). Although the photo quality was poor under high magnification, the appearance of iris pigmentation could be seen at the 7 o'clock aspect of the right eye, consistent with the location seen in the current eye exam under biomicroscopy.

Based on the clinical findings and history of a growing mass per patient observation, discussion was made with the patient as to the potential of iris melanoma, and a prompt referral to an ocular oncologist was made for biopsy and potential treatment. Fluorescein angiography of the lesion performed at the ocular oncologist office showed hyperfluorescent sentinel (feeder) vessels in the lesion, and fine-needle aspiration with cytological evaluation revealed spindle cells consistent with iris malignant melanoma.

The patient underwent brachytherapy (radioactive Iodine-125 plaque) for four days followed by post-surgical corneal treatment, with reduction of the iris mass to 0.7mm thickness, and there is no posterior extension currently. Genetic testing of the mass biopsy showed a gene expression profile (GEP) class of 1B (low metastasis risk); however, a pulmonary nodule was identified on CT imaging, and the patient is being monitored for this as well along with periodic liver imaging.

Discussion

Ocular melanomas are rare, comprising 3.7% of all melanoma cases in the U.S, with an incidence of only 6 per million people. Notably, they are the second most-common melanoma, with skin melanomas as the most common. Caucasian patients have a much higher rate of ocular melanoma than other ethnicities, while African or Asian descent patients have a much lower rate of ocular melanoma. Of the ocular melanomas, uveal melanomas have an incidence of 4.9 per million, and iris melanomas comprise only a small fraction of uveal melanomas. The average age of diagnosis of iris melanoma is between 40 and 50 years.¹ However, younger patients have been diagnosed with this condition. There is no sex predilection or eye preference for iris melanomas. The main differentials of iris melanoma are iris nevus and iris cyst. Ocular oncologist Dr. Carol Shields and colleagues² conducted a study surveying 3680 iris tumors, and determined nevus (42%), iris pigment epithelium cyst (19%), and melanoma (17%) were the most common specific diagnoses at any age.

Iris melanomas can be well-circumscribed or diffuse. Interestingly, circumscribed versions more often appear in the inferior section of the iris. They are often yellow, tan, or brown. The surface may be flat or raised, and they can thicken anteriorly or posteriorly. A diffuse iris

Ocular Disease Consult (continued)

melanoma may appear as a flat unilateral dark iris (acquired heterochromia) and may cause secondary glaucoma. This type of glaucoma may be difficult to treat and can rarely cause eye pain if the eye pressure is high enough. Diffuse iris melanomas have a higher metastatic risk. Nasal position, extension into the ciliary body, and pigment dispersion are all associated with increased metastatic risk.³

Shields proposes the following criteria for clinical diagnosis of iris melanoma:

1. Size greater than 3 mm diameter and 1 mm thickness
2. Replaces the iris stroma
3. Three of the following features:
photographic documentation of growth, secondary glaucoma, secondary cataract, prominent vascularity, or ectropion iridis

Our case example met the first two criteria, as well as likely two elements of the third criterion (growth and vascularity). Although ectropion iridis was not present, corectopia was noted.

Risk of conversion from iris nevus to iris melanoma is increased with any of the following: younger than 40 years of age, prior hyphema, inferior tumor location, diffuse appearance, ectropion uveae, or feathery tumor margin.

Tests to help differentiate iris and ciliary body melanomas from cysts or nevi include:

- Biomicroscopy, including photo documentation and reviewing past photographs
- Globe transillumination (melanomas may appear dark, while cysts are clear)
- Dilated fundus examination including scleral indentation
- Ultrasonic biomicroscopy and/or anterior segment OCT
- B-Scan ultrasonography (can assess for ciliary body/more posterior melanomas)

- Fluorescein angiography of iris (not performed often in practice)
- Aqueous paracentesis (to check for metastasis)
- Fine-needle aspiration biopsy (for cytology/pathology study)

Genetic testing is now an extremely important component of the management of not just iris melanomas, but any ocular melanoma. The DecisionDx-UM™ genetic test (Castle Biosciences, Inc. Friendswood, Texas) developed by Dr. J. William Harbour is a genetic test that provides prognostic information on the risk of metastasis from ocular melanoma using a GEP for three classes:

Class 1A: Very low risk (2% chance of metastasis over five years)

Class 1B: Low risk (21% chance of metastasis over five years)

Class 2: High risk (72% chance of metastasis over five years)

Based on results from the Collaborative Ocular Oncology Group (COOG) study,⁴ the DecisionDx-UM™ test has shown more detailed diagnostic and prognostic value than the established monosomy 3 genetic testing for tumors or the Tumor-Nodes-Metastasis (TNM) staging classification system. The breast cancer associated protein 1 (BAP1) mutation is currently being studied as another potentially important genetic marker for ocular tumors.

Genetic testing should ideally precede treatment, as prognostic indicators of metastasis and mortality may dictate more conservative or aggressive treatment (i.e. brachytherapy versus enucleation). However, the Collaborative Ocular Melanoma Study (COMS)⁵ showed similar 5-year mortality rates (18-19%) for medium-sized choroidal melanomas when treated with either brachytherapy or enucleation. Our patient opted for the brachytherapy treatment over sectoral tissue excision or enucleation.

Ocular Disease Consult (continued)

In summary, a combination of history, prior photo documentation, and other advanced testing resulted in an important diagnosis with significant consequences.

We are happy to provide specialized ocular disease testing and consultations for your patients. Please feel free to reach us at any of our Pacific EyeClinic locations.

Selected References

1. Waheed NK et al. Iris Melanoma. In Drugs and Diseases, Medscape. <http://emedicine.medscape.com/article/1208624-overview>.
2. Shields CL, Kancherla S, Patel J, et al. Clinical survey of 3680 iris tumors based on patient age at presentation. *Ophthalmology*. 2012 Feb. 119(2):407-14.
3. Demirci H, Shields CL, Shields JA, Eagle RC Jr, Honavar SG. Diffuse iris melanoma: a report of 25 cases. *Ophthalmology*. 2002 Aug. 109(8):1553-60.
4. Onken, et al. Collaborative Ocular Oncology Group Report Number 1: Prospective Validation of a Multi-Gene Prognostic Assay in Uveal Melanoma. *Ophth*, epub. The Collaborative Ocular Melanoma Study: An Overview. 2012. 1-8.
5. Margo CE. The Collaborative Ocular Melanoma Study: an overview. *Cancer Control*. 2004 Sep-Oct; 11(5):304-9.

Advances in Contact Lenses

MATT LAMPA, OD, FAAO | CORNEA AND CONTACT LENS SERVICE CHIEF

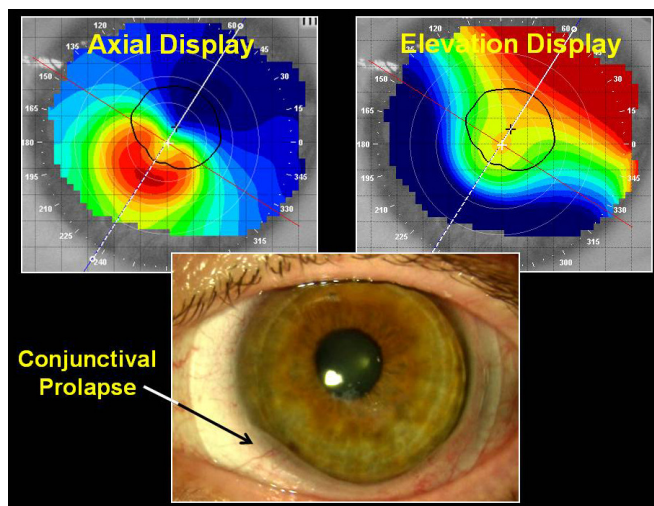
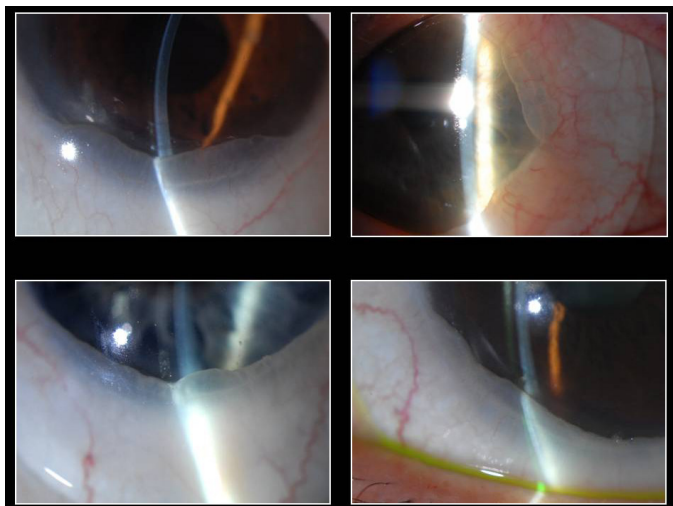
With the rebirth of scleral lenses in modern optometric practice we have begun to see some complications unique to this modality emerge. One such complication is referred to as conjunctival prolapse (left image) where the conjunctival tissue folds over the peripheral cornea.

This tends to occur under the portion of the scleral lens that has the most clearance (right image). It is assumed to be secondary to suction forces under the lens that are greatest in the area

with greatest clearance. Long term effects of this complication are unknown at this point.

In an attempt to resolve this complication, it is recommended that you decrease the clearance in this area. This is done by bringing the lens down to the plane of the ocular surface by manipulating the posterior lens geometry.

Don't hesitate to contact the contact lens faculty regarding contact lens complications you may encounter.

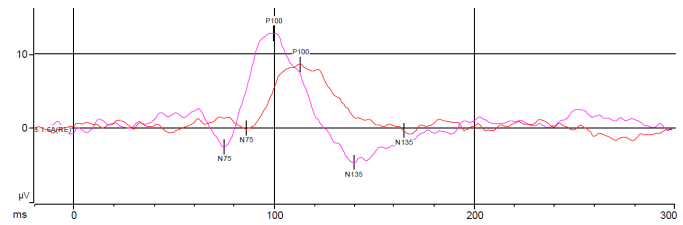


Advances in Neuro-Ophthalmic Disease

DENISE GOODWIN, OD, FAAO | NEURO-OPHTHALMIC DISEASE CLINIC

Generally neurologic conditions can be differentiated from retinal conditions based on clinical findings. However, when the condition is subtle or not a classic presentation, the diagnosis can be difficult. Electrophysiology has proven extremely valuable in differentiating retinal and neuro-ophthalmic conditions. Also, evaluation of unexplained visual acuity or visual field loss, monitoring progression of neuro-ophthalmic conditions, and providing objective evidence of non-organic vision loss are a few situations when electrodiagnostic testing can be helpful.

Visual evoked potential (VEP) measures the integrity of the entire visual pathway and is quite adept at detecting pathology posterior to the globe. It can be extremely valuable in diagnosing questionable cases of optic neuritis. The figure above shows a pattern VEP from a 29-year-old female who was experiencing pain around the



Pattern VEP showing delayed response in the right eye (red) compared to the left eye (purple).

right eye and hazy vision. Visual acuity was 20/20 in both eyes. There was 70% red desaturation and a mild nasal visual field defect in the right eye. Anterior and posterior segment health was unremarkable. Pattern VEP showed delayed responses and reduced amplitude in the right eye compared to left, helping us confirm the diagnosis of demyelinating optic neuritis.

If you have questionable cases that require electrophysiology, we would be happy to help.

Advances in Binocular Vision

MEGAN CHAPMAN-REXFORD | PORTLAND VISION THERAPY COORDINATOR

It is easy to refer a patient to our Vision Therapy Services. We have two locations: Downtown Portland (Coordinator Megan Chapman-Rexford at 503-352-2504 phone, 503-352-2523 fax) and Forest Grove (Coordinator Irene Arroyo at 503-352-2174 phone, 503-352-2261 fax). You can talk to either coordinator for general information, but it is best to talk to the coordinator specific to the clinic location to which you wish to refer the patient.

The best way to refer a patient to the vision therapy service is to fax their information and most recent comprehensive exam records. If you know the patient is in any other therapeutic programs, such as occupational therapy, or has undergone specialty testing, such as neuropsychological or psychoeducational

evaluations, please inform us. We will acquire those records as they might have application to our therapy.

You can specifically refer to any of our VT doctors. Please put a note on the cover sheet or within the medical records if you would like to refer to a specific doctor. If you would like to refer to a doctor specializing in a particular disorder, you can call us to discuss who would best serve that patient.

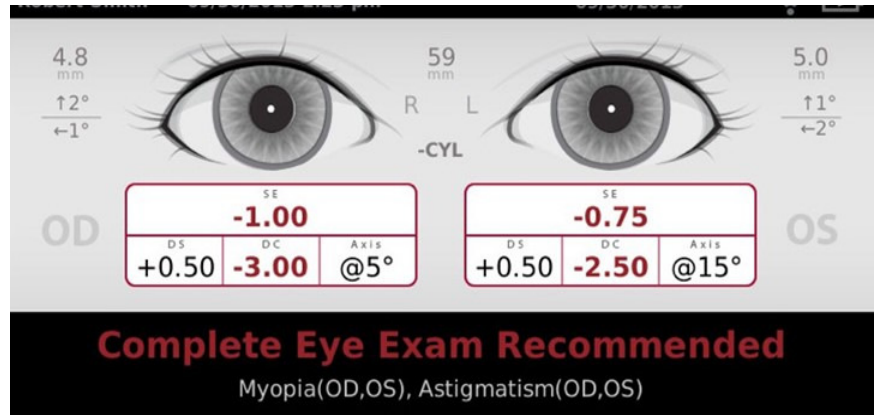
We both work hard to make referrals as easy as possible by contacting patients in a timely manner, within 24 hours in most cases. Our mission is to make referrals and treatment as streamlined as possible and create an environment where success is attainable.

Advances in Pediatric Care

JP LOWERY, OD, ME_d, FAAO | PEDIATRIC SERVICE CHIEF

Many Oregon OD's are seeing more kids coming in than ever before. A big part of this is the new law that went into effect in Oregon last year requiring all children to have either a vision screening or full vision exam prior to entering school. The other factor is that the Oregon Lions Sight and Hearing Foundation have dramatically expanded their school vision screening program to use digital photoscreeners, which catch children with significant refractive error and strabismus. Using the Spot™ Vision Screener (Welch-Allyn) instead of the acuity chart and stereo test, the Lions Foundation have increased screenings from about 30,000 kids in 2010-11 to about 180,000 this year.

Good questions have been raised about the validity of photoscreening that I hope to clarify here. First, it is important to understand what the instrument provides. The basic report from the instrument is shown above. It provides measures of refractive error, ocular alignment, pupil size, and inter-pupillary distance. Keep in mind that this is a screening instrument and is not meant to be used to derive prescriptions without a comprehensive exam. The screening report only indicates Pass or Fail based on specific cut-offs for myopia (1D), hyperopia (2.5D), astigmatism (1.5D) and anisometropia (1D). Several published studies have evaluated the validity of the Spot™ Vision Screener for detecting significant refractive error and strabismus. Sensitivity (ability to accurately detect true positives) is between 80-92% while specificity (ability to correctly identify children with normal vision) has been reported in the 71-87% range. So, some children who would benefit from correction are slipping through, but most of the missed cases are due to borderline refractive error, especially hyperopia. We need to keep in mind that these sensitivity and specificity values are quite good for a vision screening test battery conducted in the public school environment.



We have been using a Spot™ Vision Screener at Pacific for the past 3 years. Based on comparison of the Spot™ Vision Screener refractive measurements to our clinical refractive measures in our pediatrics clinics I can share some observations. In most cases, the refractive measures are fairly accurate for both sphere and cylinder, within 0.75 D of our non-cycloplegic retinoscopy. The Spot™ Vision Screener is not quite as accurate or repeatable as a standard table-top autorefractor, but the instrument reads both eyes simultaneously from a 1 meter distance in about 10 seconds. This makes it possible to obtain readings on just about any child. The Spot™ Vision Screener will underestimate hyperopia just like any autorefractor, particularly without cycloplegia. We have been finding that children with significant ametropia (1 D or more above the cut-offs) are being detected in the vast majority of cases. More specific information on the instrument can be found on the Welch Allyn web site.

I hope this helps to clarify some questions and concerns regarding photoscreening. We, as a profession, need to continue to lead the agenda in promoting quality, comprehensive vision care for all children in Oregon. The Lions Foundation screening is a good first step as a public health measure. It's up to us to finish the job by providing appropriate care, as well as reporting the results and recommendations back to parents and school officials.

CE Opportunities

September 2016:

-Great Western Council of Optometry; Oregon Convention Center, Portland, OR; Sept. 28-Oct. 1.

-PUCO Tulalip Continuing Education; Tulalip, WA; Sept 18.

October 2016:

-PUCO Homecoming CE; Jefferson Hall, Forest Grove, OR; Oct. 15.

January 2017:

-Island Eyes Conference; Kauai Marriott Resort, Lihue, HI; Jan. 22-28.

February 2017:

-OOPA Practice Management Seminar; Embassy Suites Hotel, Portland, OR; Feb. 23.

Research Opportunities

We are recruiting children 7-13 years old as research subjects for a research project: Effects of Alternate Occlusion on Children's Fixation Disparity in Reading. Subjects need to make two visits to VPI, two hours each, with the task of reading text on a computer screen.

Subjects should have one of the following:

- Exophoria > 8 prism diopters,
- Esophoria > 3 prism diopters,
- Stereoacuity > 60 arc seconds, or
- Near point of convergence > 8 cm

Compensation: At the end of participation, subjects will be paid \$20 per hour.

If interested, please schedule an appointment through our online scheduler at www.pacificu.edu/vpi and select "Display Resolution Study." For details or any questions, please email vpi@pacificu.edu.

Practice Management Tips

CINDI RAPP | DIRECTOR OF CLINICAL OPERATIONS

Building an Effective Team Starts with the Leader

Building teams that are loyal, productive, and communicate well start with the leader. If you expect others to be professional, tolerant, open, and accountable, you must be the first to exhibit those qualities. To see how your practice measures up, ask these questions, and think about how you might answer:

1. Have you invited your team to join your vision and mission, and does it align with their values and workplace goals? Including the team helps create ownership and loyalty.
2. Have you developed communication agreements and behavioral expectations as to how you will treat one another? Consider such items as going directly to the person when in conflict, listening with an open mind, focusing on the issue, not the person, etc.
3. Does your team know that the work they do matters? When they do well, let them know out loud and often. Show your appreciation.
4. Do they have the support and resources to accomplish the work you want them to do? If so, encourage them to innovate and problem solve. When mistakes happen, be tolerant and help them learn.
5. Do you hold your team accountable? Conflict and resentment will increase if you allow the expectations you have set to be violated. Continue to communicate job expectations and address performance issues.

This is about who you are and how you speak and act as you build towards a trusting, collaborative team environment. It takes work, but the pursuit is worthy of all your effort!

Referral Service Contact Numbers

Pacific EyeClinic Forest Grove

2043 College Way, Forest Grove, OR 97116

Phone: 503-352-2020

Fax: 503-352-2261

Vision Therapy: Scott Cooper, OD; Graham Erickson, OD; Hannu Laukkanen, OD; JP Lowery, OD

Pediatrics: Scott Cooper, OD; Graham Erickson, OD; Hannu Laukkanen, OD; JP Lowery, OD

Medical Eye Care: Ryan Bulson, OD; Tracy Doll, OD; Lorne Yudcovitch, OD

Low Vision: Karl Citek, OD; JP Lowery, OD

Contact Lens: Mark Andre; Tad Buckingham, OD; Patrick Caroline; Amiee Ho, OD; Beth Kinoshita, OD;

Emily Korszen, OD; Hannah Shinoda, OD

Pacific EyeClinic Cornelius

1151 N. Adair, Suite 104 Cornelius, OR 97113

Phone: 503-352-8543

Fax: 503-352-8535

Pediatrics: JP Lowery, OD

Medical Eye Care: Tad Buckingham, OD; Sarah Martin, OD; Caroline Ooley, OD; Lorne Yudcovitch, OD

Pacific EyeClinic Hillsboro

222 SE 8th Avenue, Hillsboro, OR 97123

Phone: 503-352-7300

Fax: 503-352-7220

Pediatrics: Ryan Bulson, OD

Medical Eye Care: Dina Erickson, OD; Amiee Ho, OD; Michela Kenning, OD

Neuro-ophthalmic Disease: Denise Goodwin, OD

Pacific EyeClinic Beaverton

12600 SW Crescent St, Suite 130, Beaverton, OR 97005

Phone: 503-352-1699

Fax: 503-352-1690

3D Vision: James Kundart, OD

Pediatrics: Alan Love, OD

Medical Eye Care: Susan Littlefield, OD

Contact Lens: Matt Lampa, OD

Dry Eye Solutions: Tracy Doll, OD

Pacific EyeClinic Portland

511 SW 10th Ave., Suite 500, Portland, OR 97205

Phone: 503-352-2500

Fax: 503-352-2523

Vision Therapy: Bradley Coffey, OD; Ben Conway, OD; Scott Cooper, OD; James Kundart, OD

Pediatrics: Bradley Coffey, OD; Ben Conway, OD; Scott Cooper, OD; James Kundart, OD

Medical Eye Care: Ryan Bulson, OD; Candace Hamel, OD; Scott Overton, OD; Carole Timpone, OD

Contact Lens: Mark Andre; Candace Hamel, OD; Emily Korszen, OD; Matt Lampa, OD; Scott Overton, OD;

Sarah Pajot, OD; Neeru Shore, OD

Neuro-ophthalmic Disease/Strabismus: Rick London, OD

Low Vision: Scott Overton, OD