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Who gets Corneal Infection and Why?
Epidemiological techniques study “The distribution and determinants of diseases in a population” or in other words “Who gets it and why do they get it”. These techniques have been applied since the late 80’s to provide detailed information on risk factors for bacterial, Acanthamoeba and fungal keratitis. Simple descriptive epidemiological studies have shown that in developed societies, where the use of contact lens (CL) wear is widespread, CL use has accounted for over half of all new cases in the last 20 years. The case control study is a powerful and efficient technique for identifying differences in risk for exposures that are important causes of rare diseases. This study design, as well as cohort studies, have been used both to measure the risks of different CL types and wearing schedules for keratitis, as well as the role of hygiene related, behavioural and demographic factors. These data have also been used to inform us about pathogenesis, and to direct the design of laboratory investigations to confirm hypotheses regarding causation.

The most recent studies have included all contemporary contact lens types and have shown that the risk of overnight wear (ON) of contact lenses is 5x greater than the risk of daily wear regardless of lens type - unchanged since ON wear was first identified as the principal risk factor for keratitis 20 years ago. The annualized incidence of keratitis is lowest in daily wear lens users, at 1-2 per 10,000 rising to 19-25 per 10,000 for overnight wear. Loss of vision occurs in less than 1:10,000 per year overall. The risk of keratitis is similar for both daily disposable and planned replacement CL users, but the risk of developing severe keratitis is significantly increased in the latter.

These data show that corneal hypoxia is unlikely to be a risk factor for keratitis, in that the risks are unchanged in users of silicone hydrogel lenses. When correlated with laboratory studies these data show that CL case contamination, by bacterial, fungal and Acanthamoeba biofilms, accounts for the limited effect of hygiene measures on the development of keratitis and the increased risk of severe keratitis in planned replacement soft CL users compared to daily disposable lens users, for whom case contamination has been eliminated as a risk factor. Acanthamoeba keratitis is more common in the UK than elsewhere probably because of amplification of the organism in domestic tank stored water, coupled with the favourable environment for microbial growth provided by limescale on domestic taps in hard water areas.
Contamination of drinking water supplies has also been implicated in Chicago, USA. Other risk factors are exposure to well water and water in hot tubs, swimming or showering in CL’s, and the use of CL solutions that are ineffective against *Acanthamoeba*. Ninety percent of *Acanthamoeba* keratitis patients have been exposed to avoidable risk factors. Filamentary fungal keratitis was identified in CL users in 2006 and related to the use of a specific CL solution.

Epidemiological genetic studies have provided evidence that Individual differences in susceptibility to microbial keratitis may be partly explained by differences in single nucleotide polymorphisms in certain cytokine genes (IL-10, IL-6 and IL-12B), and a defensin, that have a proven or potential role in corneal infection.

These studies have demonstrated that CL associated infection has multiple causes. Many risk factors are avoidable. Implementation of these findings can be shown to lead to safer CL use.

*PD Dr. med. Martina Knecht-Bösch*

in collaboration with Professor Stephanie L. Watson

*Bsc(Med), MBBS, FRANZCO, PhD, Nic Di Girolamo PhD*

**Ocular surface reconstruction on a cellular basis**

A healthy cornea is reliant on a distinct population of stem cells (SC) that replace damaged or aging epithelium throughout life. Depletion of the SC pool or damage to the niche can result in a blinding and painful condition known as limbal-SC deficiency (LSCD). In cases of total LESC failure, a population of stem cell (SC) must be introduced to regenerate and restore the ocular surface. Strategies to correct LESC failure have relied on harvesting large segments of limbus from the healthy contralateral eye (unilateral cases); however, SC depletion in the donor eye is a risk. An alternative method utilizes allogeneic grafts (bilateral cases) from living relatives or cadaveric donors. However, persistent corneal defects have been noted, and to prevent rejection, long-term systemic immunosuppressive therapy is required. For unilateral limbal dysfunction, cultured autologous limbal progenitors have been transplanted. A decade ago, Pellegrini et al. pioneered a method of culturing LESC from small (1mm2) grafts harvested from a healthy eye (in unilateral cases), expanded in culture, and maintained on a layer of lethally irradiated mouse 3T3 feeder cells. Epithelial progenitors were removed from the feeder layer as intact sheets and transferred directly to the patient’s cornea using a soft CL as the carrier. Other carriers used have included paraffin gauze, porcine collagen shields, synthetic products, and fibrin gel; however, all these methods are cumbersome as the cell sheet is free floating. Amniotic membrane alone (for partial LSCD) or as a substrate for ex vivo expansion of LESC (in total LSCD) minimizes these problems but still requires a surgical procedure. However, donor-to-donor variability, limited availability, cost of screening, preparing and storing, and its inherent semiopaqueness, which can impede visual acuity, are disadvantages. Despite the promising clinical outcome reported for current autologous transplantation procedures to treat LSCD, most methods use animal products, foreign human tissue or non-Food and Drug Administration (FDA)
approved biomaterials thereby increasing the risk of xenobiotic infection, and side effects from
the biomaterials. Investigators have trialed synthetic and biodegradable polymers as cell carriers
in animal and culture models of LSCD, but their efficacy in humans is not yet established. A
novel autologous technique that circumvents these problems has been developed by using an
FDA-approved soft CL as the substrate, carrier, and bandage to protect the eye during
transplantation and healing. Currently this remarkable ocular surface restoration has been
accomplished in 18 patients with LSCD as of yet with no adverse side effects.

Professor Dr. Dr. h.c. Franz Grehn
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Is trabeculectomy still up to date?
Since Trabeculectomy was introduced in the late 1960s this type of filtration surgery has become
the goldstandard for surgical treatment of advanced primary open angle glaucoma. Several
modifications over time have improved the safety profile of this operation. With the development
of modern non-penetrating glaucoma surgeries such as Canaloplasty the discussion about the
balance between safety profile and efficacy has again come up. As far as conventional non-
penetrating surgery is concerned, trabeculectomy has proven to have lower final intraocular
pressures. Comparative prospective randomized studies for canaloplasty are still lacking.

It may seem helpful to re-evaluate the knowledge on the different levels of outflow resistance to
better understand the mechanism of glaucoma procedures. While we are used to consider the
trabecular meshwork to be the main outflow resistance, one should further evaluate the
contribution of Schlemm´s canal and collector channel resistance in primary open angle
 glaucoma.

One of the major drawbacks of trabeculectomy, namely postoperative hypotony, may be
improved by using a two level outflow resistance technique in a modified trabeculectomy. The
 technique of this procedure will be demonstrated.
**Professor Dr. med. Dr. rer. nat. Jens Funk**  
Department of Ophthalmology  
University Hospital, Zurich, Switzerland

**Will customized glaucoma surgery be the future?**

Trabeculectomy is still called “the gold standard of glaucoma surgery”. However, it has several drawbacks such as hypotony, bleb inflammation, scarring, choroidal detachment, dry eye symptoms etc. In addition, it requires an intensive postoperative care and its success rate is only around 60 to 80%.

New alternative techniques have been developed in the past years. These are: drainage devices, deep sclerectomy, canaloplasty, selective laser trabeculoplasty, excimer laser trabeculotomy, trabectome surgery, goniocurretage, trabecular aspiration, trans scleral diode laser cyclophotoagulation or endoscopic cyclophotoagulation. Unfortunately we often propagate our own favorite operation as the new overall solution for glaucoma, i.e. as the new gold standard. Instead of doing this we rather should consider the wide variety of antiglaucoma procedures as being a great chance, because it allows us to individualize our surgical options and to find an optimal solution for each individual patient.

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**Consequences of Vitrectomy**

The University Eye Clinic in Zurich has always been at the forefront of the advancement of science in European Ophthalmology: from Johann Friedrich Hoerner right up to the present leadership.

In the early phases of retinal surgery, Zurich was put on the map by Professor Rudolf Kloeti who not only developed one of the first vitrectomy instruments but taught the subject widely.

In those early days, new indications for vitrectomy were increasing rapidly but it is only recently, that we have begun to understand the consequences of the absence of vitreous gel from the eye. These have profound implications for the entire globe: in the posterior segment, it changes the clearance of intraocular drugs and the altered oxygen tension influences the retinal function, especially in patients with retinal vascular disorders. In the anterior segment, the underlying mechanisms of the inevitable development of post-vitrectomy cataract and, after lens implantation, the open angle glaucoma are being better understood.
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Retinal Tracking And Image Registration In Modern Ophthalmology:  
A Quick Look Under The Hood

Once a photographic art, retinal imaging has recently seen a tremendous development. Increasing resolution in digital imaging, new modalities such as high resolution optical coherence tomography or fundus autofluorescence, and the availability of ever-increasing computer processing power provide the ingredients for tools that allow new insights in health and disease of the eye’s posterior segment. Machine precision furthermore has a potential to enhance manual therapeutic procedures such as retinal photocoagulation. The implementation of such tools requires algorithms for intra- and multi-modal image registration. For, e.g., the delivery of automated retinal photocoagulation, retinal images have to be tracked in real-time, requiring not only precise but also fast and reliable registration. The implementation of such algorithms, despite the availability of current computer processing power, remains challenging. Distortion, noise, non-uniform illumination, and motion blur in the images to register have to be dealt with. Here we give an overview of the details, difficulties and performance of an algorithm for real-time retinal image registration for computer assisted retinal photocoagulation.

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Chairman, Department of Ophthalmology  
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Extending cone photoreceptor life and function

Currently, there is no known effective treatment that can prevent or reverse the vision loss in hereditary and age-related retinal dystrophies. In retinitis pigmentosa, one of the most common inherited retinal degenerative diseases, the loss of light-adapted visual responses is the key event leading to blindness. As this disease is caused by mutations in more than 50 different genes and loci, the development of specific therapies (possible in principle) would be impractical. Therefore, mutation-independent approaches, including preservation or partial restoration of impaired cone function based on neuroprotection or optogenetic approaches offers today very promising perspectives. We demonstrated that cone cell function loss might result from the loss of expression of Rod-derived Cone Viability Factor (RdCVF) consecutive to the degeneration of rod photoreceptor cells directly affected by the causative mutations. Administration of RdCVF, irrespective of the gene defect, induced in relevant animal models a strong preservation of cone cell function related to the maintenance of rod outer segments (reviewed in Leveillard and Sahel, 2010). Recently, work conducted by Botond Roska from the Friedrich Miescher Institute for
Biomedical Research in Basel and researchers from the Vision Institute in Paris showed that in advanced cases of retinal degeneration, cell bodies of “dormant” cones can be reactivated by light-driven ion pumps (proteins found in phylogenetically ancient archaea), thus restoring cone function through adequate stimulation (Busskamp et al, 2010). The main advance of the optogenetic approach, currently under pre-clinical evaluation, is that it may provide artificially stimulated retinal activity closer to the normal activity of retinal circuits. These experiments bring strong emphasis on the assessment of the status of cone photoreceptors during the course of the retinal degenerative disease and the possibility to preserve vision by extending cone photoreceptor life and function. Being independent of the underlying genetic defect, the protection of cone photoreceptors by trophic factors and optogenetics opens new horizons for treatment of currently untreatable retinal degenerative diseases.

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The hypoxia connection: its influence on retinal development and neuroprotection

Hypoxic signaling is a critical determinant for the development of the retinal vasculature and for the survival of photoreceptor cells. Hypoxic preconditioning completely protects photoreceptors against light-induced phototoxicity. Central to the hypoxic response are the hypoxia inducible transcription factors (HIFs), which are activated by the von Hippel Lindau (VHL) protein complex through stabilization of the oxygen labile HIFalpha subunits. This leads to the differential regulation of HIF target genes including vascular endothelial growth factor (VEGF), erythropoietin (EPO) and others. To investigate the influence of the HIF-EPO signaling system on retinal development, physiology, and neuroprotection, we generated photoreceptor-specific and retina-specific knockouts of Hifa, Vhl, or Epo using the cre-lox system.

Lack of VHL in rod photoreceptor cells induced a hypoxia-like response in normoxia and increased levels of HIF1A and HIF2A. This resulted in the elevated expression of several hypoxia-related genes, but not of Epo. The knockout transiently protected photoreceptors in young adults but resulted in retinal degeneration in old (1 year) mice. Knockdown of Vhl in most retinal cells caused a sustained activation of HIF transcription factors and resulted in severe defects in the developing retinal vasculature and strong retinal degeneration despite a 30-fold induction of Epo gene expression.

Lack of HIF1A in adult photoreceptors reduced expression of HIF1 target genes, but not of Epo, in response to hypoxia. Hypoxic preconditioning protected photoreceptors lacking HIF1A similarly to wild type. Knockout of HIF1A in most cells of the retina already during retinal development caused elevated levels of HIF2A protein and of Epo mRNA. Although global retinal expression levels of Vegf were not affected, the HIF1A knockout resulted in a vascular
phenotype characterized by the lack of the intermediate plexus. Knockout of EPO receptor in addition to HIF1A did not alter this phenotype.

We conclude that a fine-tuned HIF signaling system is required for normal retinal development, the formation of the retinal vasculature and the protection of neuronal cells after hypoxic preconditioning.

**Professor Gerd Holmström, MD PhD**
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**Why do we need to screen for ROP?**
ROP is one of the few causes of childhood blindness, which in many cases is preventable. However, it requires an adequate screening to detect and initiate treatment at a correct time. Screening for ROP fulfills WHO’s criteria for screening (Wilson & Jugner -68); the disease is well defined, has a well-known natural history, a good method of examination is available and treatment is possible in most cases. It has also been shown to be cost-effective. Nevertheless, screening for ROP is expensive and also stressful for the infant. It is therefore important to continuously follow the incidence of ROP, to be able to adjust and modify screening criteria, including only infants at risk of treatment requiring ROP.

Prematurely-born infants need to be examined regularly in the neonatal period to detect infants who need to be treated for ROP. For that purpose, local guidelines ought to be elaborated and must take into account the local organisation and quality of health and neonatal care and also the socio-economic circumstances of the society (Gilbert et al –05). Such programs should preferably be based on population-based studies of the country per se. It is also important that those studies are repeated, since neonatal care is continuously improving, which may affect the incidence of ROP.

Population-based studies in Sweden are facilitated by personal identification numbers and by a very high compliance to maternity care in the country. Several population-based studies on the incidence of ROP have been performed during the last decades and will be reported. Based on these studies we have been able to modify the screening criteria from less than 33 weeks of gestation to less than 32 weeks at birth. We have also been able to postpone the first examination a few weeks in the most immature infants born before 27 weeks of age.

In the autumn of 2006, a web-based national register (SWEDROP) for ROP-screening, was initiated, with the purpose to evaluate and possibly modify our national guidelines for screening. Today around 4000 infants are registered in SWEDROP and the register has a coverage of more
than 90% of infants born before 32 weeks of gestation in Sweden. After ethical approval, data on infants born 2008 to 2009 have been analysed and will be reported.

In conclusion, untreated or not adequately treated ROP may lead to poor visual acuities and visual handicaps of prematurely born children. It is therefore of utmost importance that correct eye screening is performed and that appropriate national guidelines are elaborated and continuously revised.

**Dr. med. Rike Michels**  
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**Systemic Propranolol in the Treatment of Early Childhood Eyelid Hemangiomas**  
Purpose: To evaluate the effect of systemic propranolol on eyelid hemangioma in early childhood obstructing the visual axis or inducing astigmatism.

Design: Retrospective interventional case series

Methods: Six children with hemangioma involving the eyelids were treated with the beta-blocker propranolol as first line therapy. Propranolol dose ranged from 3x2mg/d to 3x3mg/d orally for up to 12 months and was then tapered down. Prior to treatment and in follow-up children were evaluated by pediatric ophthalmologists and pediatric cardiologists. The first two days of treatment were in monitored inpatient care.

Results: All hemangiomas regressed, showing first signs of regression within two weeks. Regression was individually variable ranging from about 50% regression to complete regression. None of the children developed persistent amblyopia due to obstruction of the visual axis in follow-up. The treatment was overall well tolerated.

Conclusion: Treatment of potentially amblyopia inducing eyelid hemangioma in early childhood with systemic propranolol has become the gold standard.
Dysthyroid Optic Neuropathy (DON)

Thyroid eye disease (TED) is an immune-mediated inflammation often associated with autoimmune thyroid disease that causes enlargement of orbital muscle and fat. The disease severity and activity can be categorized using the VISA classification. Disease severity is graded using four VISA parameters: Vision (DON), Inflammation (congestion), Strabismus (diplopia/restriction) and Appearance (exposure). The disease follows a biphasic course with an active (progressive) phase lasting 6 to 18 months during which VISA grades worsen, followed spontaneously be an inactive (stable) phase.

Dysthyroid optic neuropathy (DON) is a potentially reversible optic nerve dysfunction occurring in about 6% of patients with TED. It most commonly results from compression of the nerve by enlarged muscles in the tight orbital apex, although occasionally optic nerve stretch associated with severe proptosis may be a factor. DON patients tend to be older, more likely male and more commonly diabetic than TED patients without DON. The onset may be insidious and in early cases the diagnosis may be uncertain. Emotional stress, systemic infections, surgery and radioactive iodine may precipitate onset of DON. It typically is diagnosed while the disease is progressive/active.

Clinical features include blurring of central vision and desaturation of colours, both confirmed on visual examination. Colour vision changes are a more sensitive indicator of DON than central acuity. In a review of 58 cases managed by myself, 55% had a relative afferent pupil defect, but only 32% demonstrated disc edema. The latter is not a sensitive marker for DON, but when present is specific. Associated VISA findings include mean congestive/inflammatory scores of 5/10 and mean strabismus scores of 2/3. Appearance changes are not a reliable indicator of DON, as some patients may have minimal proptosis or lid retraction and still have progressive DON.

Common CT findings include apical crowding, distension of the optic nerve sheath; in our series, intracranial fat herniation or straightening of the optic nerve were not reliable indicators of DON. Paracentral visual field defects are identified in 70% of DON patients.

Medical management of DON includes oral or intravenous glucocorticoids, while cyclosporine and rituximab have showed promise in small case reports. In my review, over 90% of patients showed temporary response to medical intervention, but only 7.5% were able to avoid surgical intervention.

Radiotherapy (XRT) caused improvement in 96% of cases of DON in a 2002 report by Kazim et al. It may also prevent new onset DON: a review of all my patients over the past 12 years being
treated for progressive TED found new onset of DON in 7% of patients who were on steroid therapy alone compared with 0% of patients who received XRT.

Surgery usually consists of bony decompression of the posterior medial wall and floor although lateral wall decompression and fat excision have also been described. A review of my cases found 90% improved vision to 6/12 or better, and that even severe central vision pre-operatively might be improved to excellent vision. Delay to surgery did not necessarily result in a poorer outcome.

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Nanotechnology meets lacrimal duct system

Lacrimal surgery in cases of severely obstructed or missing canalicular ducts is highly challenging. In these cases the placement of a bypass tube is currently the only option to restore the drainage of tears into the nose and reduce the symptomatic watery eye. Different approaches to achieve functional drainage have been tried using blood vessels or artificial implants. The implantation of the rigid Lester-Jones tube (LJT) is, since its introduction in the late 1960s, the gold standard. However, complication rates are high and remain, even with many modifications of the original design, still a major problem. These complications include mainly the displacement and blockage of the tube, requiring regular checkups, as well as irritation of the surrounding tissue including the nose and the eye.

The objective of this study was to develop a new lacrimal duct conduit (LDC) in order to restore structural and functional integrity of the lacrimal drainage system. The conduit is constructed with a novel polymer, polyhedral oligomeric silsesquioxane (POSS) - poly(carbonate-urea)urethane (PCU), that offers biocompatibility. We exploit nano-topography to evade the problems associated with current applications. A number of extrusion techniques were investigated for this purpose: ultrasonic atomisation spraying, electrohydrodynamic atomisation (EHDA) spraying/spinning, extrusion-coagulation, high pressure coagulation by autoclave and by casting. Finally, the coagulation and cast technique was selected to construct an LDC superior to its predecessors, and its advantages highlighted. Silver nanoparticles were added improving antimicrobial properties.

We have developed a novel access and treatment for watery eyes due to missing or severely obstructed upper lacrimal ducts. It is possible to focus treatment precisely at the level of the damaged canalicular area and reconstruct it anatomically by replacing it with a smooth functional small diameter POSS-PCU conduit. This prevents further damage to the residual healthy lacrimal duct system and therefore improves functionality and reduces inflammatory reaction due to major surgery.
Study was performed in context of a PhD at the University College London (UCL). 
Supervisor: Prof. AM Seifalian

Professor Jonathan C. Horton MD PhD
Professor of Ophthalmology, Neurology, and Physiology
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Sunken Eyes, Sagging Brain Syndrome from Low Intracranial Pressure

Introduction: The measurement of intracranial pressure was introduced by Heinrich Quincke in 1891 when he described the technique for lumbar puncture. More than a century has passed, but still no method exists to measure non-invasively the intracranial pressure. The ophthalmologist therefore plays a crucial role in the screening of patients with headache by performing a fundus examination in search of papilledema. If papilledema is absent, it is worth considering the possibility that the patient’s headache is due to low intracranial pressure. Intracranial hypotension can occur spontaneously, usually from a tear in the spinal dura. It can also occur in patients who have undergone placement of a ventriculoperitoneal shunt without placement of a valve to prevent excessive flow of cerebrospinal fluid.

Results: We have encountered 5 patients with chronic intracranial hypotension after ventriculoperitoneal shunt placement. All 5 patients developed progressive enophthalmos. In some cases, contact was lost between the eyelids and cornea, leading to exposure keratopathy and scarring. Magnetic resonance imaging showed typical findings associated with intracranial hypotension, such as abnormal dural enhancement, flattening of the pons, and crowding of the optic chiasm. Low intracranial pressure was documented by lumbar puncture in some patients. Neuroimaging showed upwards expansion of the orbital roofs, leading to increased orbital volume. There was also an increase in the volume of the paranasal sinuses, pneumatization of the clinoid processes, and separation of the inner and outer skull tables. Several patients showed contraction in the size of the sella turcica. In one patient, shunt revision was performed by installing a valve to prevent overshunting. This intervention resulted in forwards movement of the globes and improvement in symptoms.

Conclusions: Chronic intracranial hypotension can lead to progressive enophthalmos. We have named this newly recognized condition: “Sunken Eyes, Sagging Brain Syndrome”. Low intracranial pressure causes remodeling of skull bones, especially the thinner bones of the orbit and paranasal sinuses. This condition can be partially reversed by intervening to correct the low intracranial pressure.
**The eye as an accelerometer**

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The ocular vestibular evoked myogenic potential (oVEMP) is a short-latency reflex of the extraocular muscles that is part of the linear vestibulo-ocular reflex (VOR). The reflex is elicited by stimulation of the otolith organs, which are sensitive to linear acceleration, with brief bursts of skull vibration or sound and is measured from surface electrodes placed on the skin underneath the eyes. As the reflex is abolished by vestibular lesions, the oVEMP has recently been introduced as a clinical test of otolith function in patients with vertigo. Since it is not known exactly which eye muscles contribute to this reflex, we wished to determine the muscle of origin of the oVEMP and investigate the neural pathway of the VOR to individual eye muscles. We stimulated with bursts of bone-conducted vibration and air-conducted sound and recorded single motor unit activity from the inferior oblique (IO) and inferior rectus (IR) eye muscles of three healthy human subjects using concentric needle electrodes. Standard oVEMPs were recorded simultaneously with surface electrodes. Stimulation with vibration elicited highly synchronous, short-latency bursts of motor unit activity in the IO (latency 10.5 ms) and IR (14.5 ms). Sound stimulation also produced a short-latency excitation of the IO (13.3 ms). The activation patterns of the two muscles were similar, but reciprocal, with delayed activation of the IR compared to the IO. The similar latency of the motor unit and surface responses identified the IO as the muscle of origin of the oVEMP, thus demonstrating the physiological basis of this emerging clinical test of otolith function. The single extraocular motor unit recordings provided a window into the human VOR pathways and identified short-latency neural projections of the VOR from the otoliths to individual eye muscles.

Zürich, März 2012
150 Jahre Augenklinik – Geschichte


1919 wird die Nachfolge an Prof. Dr. Ernst Sidler (1869-1922) übertragen, der zuvor unter Haab tätig war, als erster Oberarzt und Leiter der Poliklinik. Sidler erkrankt bald darauf schwer und tritt Ende 1922 zurück.


2002 übernimmt PD Dr. Klara Landau (*1953) die Leitung der Augenklinik, zunächst interimistisch, bis nach dreieinhalb Jahren das Berufungsverfahren abgeschlossen ist und sie zur Ordinaria berufen wird.

Zürich, März 2012
150 Jahre Augenklinik – Kurzporträt Klinik


Ambulante und stationäre Therapie

Erkrankungen der Netzhaut, wie etwa die altersbedingte Makuladegeneration, behandeln die Ärztinnen und Ärzte der Augenklinik über Injektionen in den Glaskörper – 3'428 dieser intravitrealen Injektionen wurden 2011 vorgenommen (+31%), zusätzlich wurden 11'867 Spezialuntersuchungen durchgeführt (+21%).

Forschung
Die Grundlagenforschung befasst sich mit der Biologie der Netzhautzellen, und zwar fokussiert auf die Frage, warum Sehzellen sterben und wie dieser Vorgang beeinflusst werden kann.

Einer der Schwerpunkte der klinischen Forschung ist die Neuroophthalmologie; die Disziplin befasst sich mit Erkrankungen des zentralen Nervensystems, die sich auf das Sehen auswirken. Die Augenklinik und die Klinik für Neurologie arbeiten eng zusammen und planen die Zusammenarbeit in einem interdisziplinären Zentrum für Neuroophthalmologie am Universitätsspital.

Aktuelle Forschungsprojekte
- Glaukom (Grüner Star): Entwickelt und geprüft wird eine Methode zur kontinuierlichen Messung des Augeninnendrucks, um die Diagnostik zu verbessern und eine präzise Kontrolle mit gezielter Behandlung zu ermöglichen.
- Tränenwege: Erforscht wird eine neue Methode, um Patienten zu helfen, deren Tränenwege infolge von Unfällen oder Tumoren zerstört sind. Mit einem nanotechnologisch hergestellten Material werden die Tränenwege rekonstruiert.
- Nystagmus (Augenzittern): In Zusammenarbeit mit der Klinik für Neurologie (Universitätsspital Zürich) und dem Institut für Molekulare Biologie (Universität Zürich) versuchen die Forschenden mehr Verständnis über die Augenkontrolle und die Verschaltung im Gehirn zu gewinnen und neue Behandlungsmöglichkeiten für Patienten mit Nystagmus zu erarbeiten.

www.augenklinik.usz.ch

Zürich, März 2012
150 Jahre Augenklinik – Porträt Klinikdirektorin

Prof. Dr. Klara Landau


Klara Landaus Forschungsinteresse gilt der Neuroophthalmologie. Diese Disziplin beschäftigt sich mit Auswirkungen neurologischer Störungen auf das Sehsystem. Dazu zählen etwa plötzlich oder allmählich auftretende Sehstörungen eines oder beider Augen, Doppelbilder sowie Veränderungen der Stellung der Augenlider oder der Pupillen. Weitere Spezialgebiete Prof. Dr. Landaus sind der Strabismus (Schielen) und die Kinderophthalmologie.

Prof. Dr. Landau ist Mitglied zahlreicher nationaler und internationaler medizinischer Fachgesellschaften und fungiert als Gutachterin mehrerer Fachzeitschriften. Seit September 2011 ist sie Präsidentin der Schweizerischen Ophthalmologischen Gesellschaft (SOG).

Zürich, März 2012
150 Jahre Augenklinik – drei Ausstellungen zum Jubiläum

**Big Eyes – Geschichte, Gegenwart und Zukunft der Augenklinik**


Gestaltet hat die Ausstellung der Zürcher Historiker und Ausstellungsmacher Dr. Ralph Weingarten.

**Installationen – der künstlerische Blick**


**Fotoausstellung – Nahaufnahmen vom Auge**

Dass medizinische Fotos eine eigene Ästhetik haben können, zeigen ausgewählte Nahaufnahmen aus dem Fundus der Fotoabteilung der Augenklinik. Die Aufnahmen von Patientinnen und Patienten der Augenklinik werden als Dauerausstellung in der Augenklinik zu sehen sein.

Verantwortlicher Projektleiter ist Peter Bär, Leiter Fotoabteilung der Augenklinik


Zürich, März 2012