EYE2EYE

QUARTER 2, 2020, VOL.23 ISSUE 2
Magazine of the Leaders in Collaborative Eye Care

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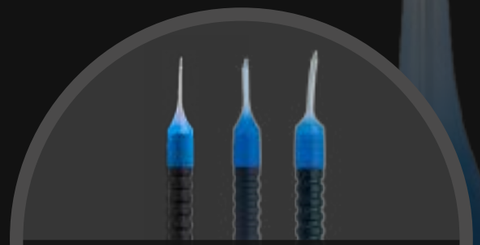

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RANZCO acknowledges the, Aboriginal and Torres Strait Islander Peoples, the Traditional Owners of Country throughout Australia and recognises their continuing connection to land, waters and community. We pay our respects to them and their cultures; and to their Elders past, present and emerging.
In recognition that we are a bi-national College, RANZCO acknowledges the Rangatiratanga of Māori as Tangata Whenua and Treaty of Waitangi partners in Aotearoa New Zealand.

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Contributors

Clare Fraser

Younger Fellows Educational Travel Scholarship 2019 – Feature News

A/Prof Clare Fraser specialised in neuro-ophthalmology, strabismus and visual electrodiagnostics. She is a consultant Visiting Medical Officer at both Sydney Eye Hospital and Liverpool Hospital, and is also in private practice in Sydney.

Stephanie Watson

From Novice to Expert: The Story of a Zoomed-out Ophthalmologist - Feature

Prof Stephanie Watson is a corneal specialist known for her ground-breaking research in corneal therapies. She is Chair of ORIA, Chair-Elect to ARVO's Advocacy and Outreach Committee and Expert Advisor to the $150M Stem Cell Therapies Mission.

Eugene Michael

Rocking the Boat – Feature

Dr Eugene Michael, MbChB BPharm, is a third year ophthalmology trainee based in Auckland, New Zealand. Eugene has a particular interest in support for those in pre-training or unaccredited positions and is a member of the Health and Wellbeing Committee as well as the Diversity and Inclusion committee.

Paul Youn

The Use of Smart Phones in Ophthalmology – Feature

Paul Youn, MD, BPharm (Hon), is currently working as an intern at Sir Charles Gairdner Hospital in Perth, WA. He is very interested in the realm of digital health and exploring the use of technologically advanced tools to fill the gaps in patient care.

Rogan Fraser

The View from (somewhere near) the Middle - Feature

Dr Rogan Fraser is a second-year ophthalmology registrar at the Royal Victorian Eye and Ear Hospital. He was part of the second cohort to be trained using the structured, virtual reality augmented microsurgical training program. He has a penchant for whimsy and antiquated vernacular.

Kiran Sindhu

What's it Worth? - In Practice

Dr Kiran Sindhu is involved in comprehensive general ophthalmology with special interests in cataract surgery and paediatric ophthalmology. He has a VMO appointment at Blacktown Mt Druitt Public Hospitals, Westmead Private and Macquarie University Hospitals. His private surgery is performed at Lakeview Private Hospital in Norwest, NSW.

Peter McCluskey

Life after COVID-19 – Food for Thought

Prof Peter McCluskey is currently Professor of Clinical Ophthalmology and Eye Health, and Director of the Save Sight Institute at The University of Sydney. He heads the largest tertiary referral, public sector uveitis service in Australia at the Sydney Eye Hospital and is a clinician scientist involved in clinical research, laboratory research and clinical trials.

Chandrashan Perera

The Use of Smart Phones in Ophthalmology – Feature

Dr Chandra Perera is currently doing his ophthalmology fellowship at Stanford University, California. He has a strong interest in digital health and has implemented a variety of medical software solutions in hospitals and clinics. As founder of the *Journal of Mobile Technology in Medicine*, he has a special interest in mHealth. Currently, he is working on AI algorithms to solve clinical problems in ophthalmology.

Ruth Hadfield

Various Articles – Feature & CEO Journal Update

Ruth Hadfield, PhD, is a freelance medical writer based in Sydney, Australia. After 10 years as an academic researcher, she set up her freelance medical writing practice. Ruth usually takes advantage of working from home by getting out for regular bush and beach walks on weekdays when there is usually almost nobody around. Recently many people seem to have discovered her secret!

Li-Anne Lim

Fighting Eye Cancer at Wills Eye Hospital with Dr Carol and Dr Jerry Shields – Feature

Dr Li-Anne Lim is an ocular oncologist, cataract surgeon and general ophthalmologist. She has a special interest in managing adult and paediatric patients with eye cancers and simulating lesions. Following her training at Sydney Eye Hospital, she undertook further subspecialty fellowship training at Wills Eye Hospital, Philadelphia, USA.

Marc Sarossy

Is Your Practice Protected from Cyberattack? - Feature

Dr Marc Sarossy is an ophthalmologist and visual electrophysiologist in Melbourne. He is head of the Ocular Diagnostic Clinic at the RVEEH. He has an interest in computing, machine learning and cybersecurity. He is an IEEE member and Adjunct Associate Professor at RMIT University.

Steve Bartnik

The Use of Smart Phones in Ophthalmology – Feature

Dr Steve Bartnik is a second year ophthalmology trainee from Perth who has a keen interest in the role of technology in clinical practice. Prior to ophthalmology training, he completed a Masters in Clinical Epidemiology with research into how telemedicine can increase the access to ophthalmology services for regional patients. When not at work he enjoys watching AFL and running.

Kris Rallah-Baker

Change in the Midst of a Crisis - Feature

Dr Kris Rallah-Baker is a proud Yuggera/Warangu man on his mother's side and Wiradjuri on his father's side. He is Australia's first Indigenous ophthalmologist, founding member and current President of the Australian Indigenous Doctors Association, is Visiting Medical Officer to the Sunshine Coast Hospital Health Service and owner of the Sunshine Coast Ophthalmologists at Noosa.

Frank Cheok

Obituary for Graeme Johnson

Dr Francis Poh Gwan Cheok OAM had been a RANZCO Fellow since 1969. He was the past Chair of the Senior and Retired Fellows in 2011 to 2015. Outside of ophthalmology, he is an accomplished musician, specialising in harmonica. He was asked to play at the opening ceremony of the 26th Congress of APAO in Sydney 2011.

Jason Ha

Is your Practice Protected from Cyberattack? - Feature

Dr Jason Ha is a junior doctor at Alfred Health in Melbourne and a recent MBBS (Hons) graduate of Monash University. During his medical studies, he undertook a BMedSci (Hons) at CERA investigating the use of hyperspectral imaging for retinal disease. He has interests in exploring the interface between ophthalmology, global health and technology.

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- **Links to further information** at Macular Disease Foundation Australia (MDFA) and their website, and to seewhatsnext.com.au

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Reference: 1. Optometry Australia. 2019 Clinical Practice Guide for the diagnosis, treatment and management of Age-Related Macular Degeneration.
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Message From The President

Technology: Transforming Ophthalmology During and After the COVID-19 Pandemic

The SARS-CoV-2 virus emerged from Wuhan, China in late 2019. Within a few months, it generated a global pandemic with over 406,000 deaths (as of 10 June 2020) with hygiene and social distancing measures the only way to reduce spread. Ophthalmology training and practice in Australia and New Zealand have been significantly disrupted. COVID-19 has accelerated global trends to work and study from home aided by technology, which will only continue when the epidemic has passed, with technology increasingly used to support work, education and wellness activities.

Ophthalmology is an at-risk profession during the COVID-19 epidemic, with ophthalmologists accounting for three of the 23 reported deaths of healthcare workers in China. Practice has been disrupted by cancellation of elective surgery. Its slow restoration and prioritisation of emergency patients is coupled with the need for social distancing, hygiene and personal protective measures while practicing. New MBS telemedicine and video medicine item numbers in Australia have allowed remote care, extending the pioneering work of A/Prof Angus Turner in WA. Some independent medical examiner (medico-legal) assessments are also occurring online. However, ophthalmologists do need to examine and investigate the majority of their patients and this reduces our ability to use telemedicine. RANZCO would welcome continuation of tele- and video-medicine consultations after the epidemic, although store-and-forward would be more useful for ophthalmic practice given our requirement for high quality imaging in patient care. Future options may include collaborating with other health care professionals who could upload visual acuity measurements, fundus photographs and other data to assist in patient care during telemedicine consultation. Ultimately, patient-generated data such as self-monitored IOP may also enable some aspects of care to be delivered remotely in the future.

Ophthalmologists are innovating to allow remote administration of their practices and clinics. Where possible, administrative staff are working from home. Zoom and other video networking apps have enabled meetings such as multi-disciplinary clinics, hospital senior staff meetings, RANZCO branch committee meetings and practice meetings. We can now attend these during the day, via Zoom, which was only previously done in the evenings or not at all.

"RANZCO would welcome continuation of tele- and video-medicine consultations after the epidemic, although store-and-forward would be more useful for ophthalmic practice given our requirement for high quality imaging in patient care."

The education of trainees and ophthalmologists is also rapidly transforming. Although training has been suspended, our staff have been extremely busy working on the online LMS. Some networks now deliver considerable teaching via Zoom. Assessment of trainees is likely to evolve in these circumstances. State branch meetings, SIG meetings and our Annual Congress have been cancelled – the latter for the first time since our inception in 1969. However, we have already developed a series of Zoom webinars on Friday lunch times for trainees and Fellows, which have been well received and a means of gaining CPD points. The International Council of Ophthalmology meeting scheduled for June 2020 in South Africa has been turned into a virtual meeting. Speakers are on a steep learning curve to record their presentation online from the Netherlands over the next few weeks. Future international meetings are likely to be a mix of face-to-face and virtual. RANZCO Fellows are likely to be able to deliver their material remotely and avoid the week of travel and jetlag that has, up to now, accompanied a presentation at an international meeting.

An increased life online does not come without cost. There is considerable risk of anxiety due to the many health and economic unknowns, and isolation of those who have reduced face-to-face contact. RANZCO is well aware of this and has established a Wellbeing group of trainees and Fellows, led by Drs Nisha Sachdev and John McCoombes as Co-chairs. The group is planning support activities, mainly online, and have already produced many useful links for everyone to follow. Ophthalmologists are coming together to support each other collegially during this time. As a small College, it is easier for us to reach out to each other face-to-face and online.

COVID-19 is accelerating the already rapid rate of change in the world as well as in ophthalmology training and practice. The College is rapidly changing in response and facilitating online learning and practice. The next 10 years will be a fascinating journey!

Clinical A/Prof Heather Mack
President

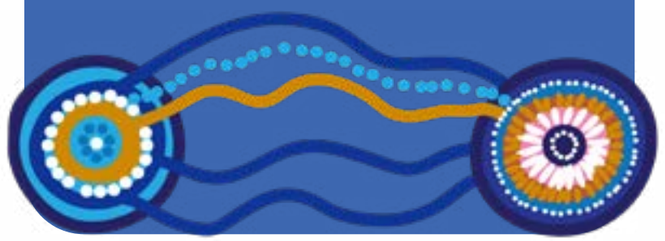
RANZCO RAP PROGRESS

Since the launch of the RANZCO Reconciliation Action Plan (RAP) at last year's Congress, RANZCO has commenced implementation and published its first six-monthly report. This is available to access on the RANZCO website. We have delivered on our goal to celebrate and participate in National Reconciliation Week (27 May to 3 June) by providing opportunities to build and maintain relationships between Aboriginal and Torres Strait Islander Peoples and other Australians.

RANZCO has:

- Hosted a virtual screening of 'Ask us anything: Aboriginal and Torres Strait Islander People' for staff.
- Utilised social media to promote #InThisTogether to raise awareness of NRW.
- Included #InThisTogether artwork on the website and in staff email signatures during NRW.
- Added resources from Reconciliation Australia to the Cultural Awareness site on the Learning Management System for Fellows to access.
- Showcased Prof Nitin Verma's video message acknowledging NRW on behalf of the College.

RANZCO would like to thank the RANZCO RAP Reference Group and Reconciliation Australia for their continued guidance in implementing the RANZCO Reconciliation Action Plan. For more information on the RANZCO RAP and a more detailed report on our activities to date, please visit the website.



Censor-In-Chief's Update

The Acceleration of Online Learning and Teaching

While the COVID-19 crisis has been hugely disruptive, it has produced some positive outcomes. From the Education Team's perspective, the major ones have been an acceleration of online learning and recognition that virtual education committee meetings can be very effective and efficient.

"As terrible as the COVID-19 pandemic has been, it has also incentivised us to accelerate our progress with online learning and teaching..."

On 28 March, the Curriculum Committee was scheduled to have a day-long meeting at the Melbourne Airport Hotel. Participants were to fly in from all over Australia and New Zealand, meet for the day and fly home again. Such meetings take us away from our families and, with up to 25 people involved, are costly from both a financial and an environmental point of view.

Because of COVID-19, the Curriculum meeting was held on Zoom which minimised the time cost and created no negative financial or environmental impact. These meetings are interactive and involve breakout groups to brainstorm components. With some adept work by the College staff, this was achieved quite satisfactorily and the meeting realised all its planned outcomes.

Most of you will have had similarly good results from virtual meetings over the last few months and will understand the potential benefit for the College going forward. While face-to-face meetings will always offer some advantages, many meetings in the future will be held online.

The Education Team has been supporting the QLD Training Network to run regular training sessions online via the Learning Management System (LMS) and Zoom. This has included a weekly Friday training session, a monthly 'Grand Rounds' session and a monthly Journal Club. The LMS site has been used to convey information about assigned readings through discussion forums. Attendance has grown significantly across the trial period and feedback from trainees and supervisors has been very positive, with trainees from more remote locations also able to participate.

Many of you will be aware of the weekly webinar series which started on 17 April and is expected to run until at least mid-June. The presentations have been consistently well attended, with approximately 200 Fellows and trainees attending weekly. The webinars are recorded and stored on the new VTP Home site on RANZCO's LMS and Fellows can accrue CPD points for participating in the webinars. Data from the weekly feedback survey for this initiative has also been positive.

There has been an acceleration of online learning for trainees in all networks. New Zealand has brought forward the creation of a Friday afternoon national teaching program accessible even to trainees in regional centres. This will help standardise teaching and ensure that every trainee is able to benefit from the expertise of consultants from all parts of the country.

CEO'S Corner

The College has a long term goal of creating a central repository of teaching resources on the LMS. This will include tutorials covering as much of the curriculum as we can with voice over Powerpoints created by a specialist in that area. The first lecture has been prepared and will likely be on the LMS at the time this issue of *Eye2Eye* is published. We will need to sort out the intellectual property issues for content creators and also have an expiry on material to ensure it is regularly reviewed and updated as necessary. However, I hope it will become a valuable resource for trainees and also for Fellows who want to refresh themselves on any particular subject.

Once we have all this didactic material available online, then trainees will be able to prepare for teaching sessions more effectively. Hospital and network sessions can become less about delivering information and more about using it to analyse case studies and problem solve.

We are also developing improved resources for trainers in a new 'Term Supervisor and Clinical Tutor Lounge'. Learning resources previously developed by RANZCO are being repurposed and in the long term, learning modules will have a stepwise progression, provide levels of interactivity to participants and asynchronous expert feedback. The site will also deliver educational webinars for supervisors with topics such as dealing with complex training situations, cultural safety and communication skills. I would encourage tutors and supervisors to keep a watch on this site as it develops:

You will be asked to sign into the portal, so have your RANZCO username and password handy.

As terrible as the COVID-19 pandemic has been, it has also incentivised us to accelerate our progress with online learning and teaching, and it has proven the value of online meetings. Our world may never be the same but some of these outcomes will be positive.

Dr Justin Mora
Censor-in-Chief

"While face-to-face meetings will always offer some advantages, many meetings in the future will be held online."

RANZCO's Digital Rise in the Time of COVID-19

The rapid changes to work as a result of the COVID-19 situation have resulted in at least one clear winner – technology. There is no doubt that while the use of technology within the RANZCO operations and by Fellows in daily practice was always high, it has undergone a huge upswing in a few short weeks. Even the most recalcitrant laggard has had to quickly adapt to Zoom-ing, using apps and the idea of telehealth consultations.

RANZCO has been re-developing our back-end IT system for over two years. Most Fellows will have experienced the changes through recording CPD activities, whether via the portal or the new app. For those who have taken the time to explore the portal, you will have seen many other features that are now much easier to access. New committee sites are being rolled out – after having been through a pilot project with the Board – and will make life easier for anyone on a committee. One area that has undergone a lot of change in a short time is the Learning Management System (LMS) which now has a wealth of resources across many areas of clinical practice, cultural safety, professional development and links to journals. It also holds the webinars which have been running every Friday since mid-April. This was a planned activity brought forward by the COVID-19 situation. The success of these has spawned other online educational initiatives such as grand rounds, journal clubs and smaller tutorials. The need for social restrictions has literally forced members and staff to use online learning or have no learning at all. But the success, while not entirely unexpected, is beyond what I had imagined, with very high number of happy participants.

Fortunately, before COVID-19 was even mentioned, RANZCO had been positioning for much greater digital interactions, especially around learning and assessments. We have employed highly experienced adult educators with the right skills and helped develop existing staff capabilities to meet the expected need. As with all things IT, it hasn't been without the occasional delay. However, I would still like to thank all the staff and Fellows involved for accepting the need for changes made and working so well to make it happen. We have in place an excellent platform which helps develop RANZCO as a leader in the digital delivery of specialist medication, education and training. While we may not have managed to turn Congress into a virtual meeting this year, we have certainly learnt a lot. It is not unreasonable to expect that a number of traditionally face-to-face scientific meetings will be virtual in 2021 and beyond.

"Fortunately, before COVID-19 was even mentioned, RANZCO had been positioning for much greater digital interactions especially around learning and assessments."

Much of the recent work has been done by teams, including Fellows, all working from home. The success of this has also been beyond expectations and I can see

this becoming the norm for committee meetings rather than having people fly in from across Australia and New Zealand. The use of video conferencing is by all accounts much better than phone conferencing. This not only has a positive effect on the overall RANZCO budget (as travel was a significant cost), but also the environment and savings in time. My colleagues at other colleges agree, and I think if we tallied up all the flying hours of all Fellows in all colleges to attend what are usually fairly short meetings, it would be substantial. I admit that my own travel schedule was previously at the upper end of the curve, but it was rare that I took a flight without seeing a familiar Fellow's face in the lounge or on a plane.

Finally, while I don't think telehealth will become the new norm for ophthalmology due to the many complicated visual tests and close patient interaction required, it will make a difference in medical care generally. It may result in the more rapid advancement of some digital eye scanning technologies and a different way of treating patients in regional or remote areas. We will keep a close eye on this.

Dr David Andrews
CEO

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Consent for New and Innovative Procedures

Venturing into the unknown can bring all sorts of rewards and challenges. In a medical context, trialling a new or innovative procedure can be quite conflicting for a doctor. On the one hand, improvements and breakthroughs would not occur without doing things differently. On the other hand, inherent in 'doing things differently' are risks that might not be fully realised or understood. Patients expect doctors to know all the risks of a new and innovative procedure so they can decide whether or not to proceed. Or do they?

Clinical trials of unregistered medicines and devices must be reviewed and monitored by an Ethics Committee. These have clear processes that need to be followed, particularly regarding patient consent. However, many innovations or deviations from the norm fall outside this scope. What occurs when the procedure is new to a particular doctor but not necessarily the industry?

Char *et al*. surveyed patients and surgeons about the types of information they would want to know during the consent process for an innovative surgical procedure ('the study'). The single most significant piece of information for patients surveyed was whether the surgeon was performing the procedure for the first time. In fact, 80% of the patients surveyed said that they could not decide on whether to consent to the surgery or not without this information. Also, rather than expecting doctors to 'know all the risks', patients valued an acknowledgement that there were unknown risks.

So what does this mean for the preoperative, consent discussions between an ophthalmologist and their patient? Is there a different type of legal test for the consent process for new and innovative procedures?

No.

The famous Australian case of Rogers v Whitaker involved an ophthalmologist and set the standard for all doctors when they have consent discussions with their patients. A doctor must provide their patient with sufficient information to make a meaningful decision. This includes information about general risks and material risks. A risk will be considered material if a reasonable person in the patient's position, if warned of the risk, would be likely to attach a significance to it. A risk will also be considered material if the doctor is or should be reasonably aware that the particular patient, if warned of the risk, would be likely to attach significance to it.

The two limbs of this standard apply to new and innovative procedures. While there is no explicit legal obligation to inform patients of the innovation per se, you must decide whether the 'new-ness' of the procedure would be considered 'material' to your patient.

From the study, we know that the majority of patients would not be able to make a decision without the knowledge of whether it was a surgeon's first time conducting a particular procedure. Additionally, the expectation of the medical experts and the NSW Supreme Court, in the recent case of Jambrovic v Day, was that the doctor should have told his patient that it was his first time performing a particular surgery. Therefore, a key takeaway for doctors is to be clear with your patients about your experience with a new approach or technique. Be open about the amount of times you have performed a new procedure. Provide information about how prevalent the procedure is and where it is being performed (either in Australia or around the world) and by whom.

The study also found that an explanation of the known risks and an acknowledgement of the unknown risks were important to patients. Patients attach significance to this information and therefore you should discuss it with them. If complications arise during or post-surgery, you will be in a better position to defend your actions if a civil claim or a complaint to a disciplinary body arose.

Items to discuss with your patient for all consent discussions — particularly those involving a new or innovation procedure:

- Your experience and training using the new approach should be made explicitly clear. This includes the number of times you have used a new approach and whether you will be supervised or assisted.
- The place of the new approach among the options available, including the evidence supporting the new approach.
- Your rationale for recommending the new approach for this patient, compared with other options.
- Potential risks and complications as well as potential benefits.
- Explore with the patient what is important for them in terms of outcomes. What would they be prepared to live with?
- Make it clear that long term outcomes and expectations may be unknown.
- Discuss any difference in cost to the patient.

Comprehensively document the discussions you have with your patient in their records. Sending a copy of your letter back to the referring doctor to the patient can be helpful. That way, they can take the time to consider your advice and it gives them the opportunity to ask thoughtful questions.

From the constant discussion, make sure that you are working within your approved scope of practice. You may need to notify your medical defence organisation before you start using a new approach to ensure you are properly protected.

More information:

For more information, watch Avant's webinar *Brave New World New Technologies and Techniques.*
Contact avanteducation@avant.org.au if you have difficulty viewing the webinar.

Rocky Ruperto
Legal and Policy Officer, Avant

References available upon request. Please email RANZCO.

CEO Journal Update

Online Article Downloads at a Record High

The 2019 publishers report for the RANZCO scientific journal, *Clinical and Experimental Ophthalmology (CEO)* was recently released to the Editorial Board. Part of the report focusses on the number of online article downloads which are the primary method by which readers access *CEO* articles. We are delighted to report that online article downloads soared in 2019 to more than 322,000, which is a 59% increase on the number of online downloads for the previous year.

The vast increase in numbers of articles accessed by readers is a reflection of the increasing quality of *CEO* articles in recent years.

It is interesting to note the geographical spread of the readership, particularly when compared with the origin of the articles published in *CEO*. As would be expected, Australian and New Zealand research reports comprise the majority (58%) of the articles published in the RANZCO journal, however Australasia only accounts for 12% of the online article downloads.

Eleven per cent of published *CEO* articles emanate from the USA, however readers in the USA downloaded more *CEO* articles (27%) than any other country in 2019. This suggests that American researchers are reading many of the excellent Australasian research papers published in *CEO*.

Victoria Cartwright
Managing Editor, CEO Journal

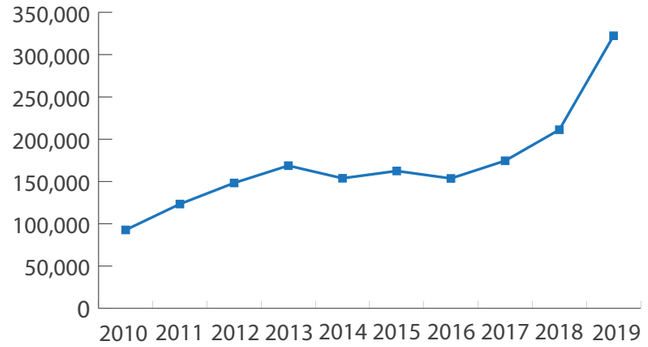


Figure 1: Article downloads trend

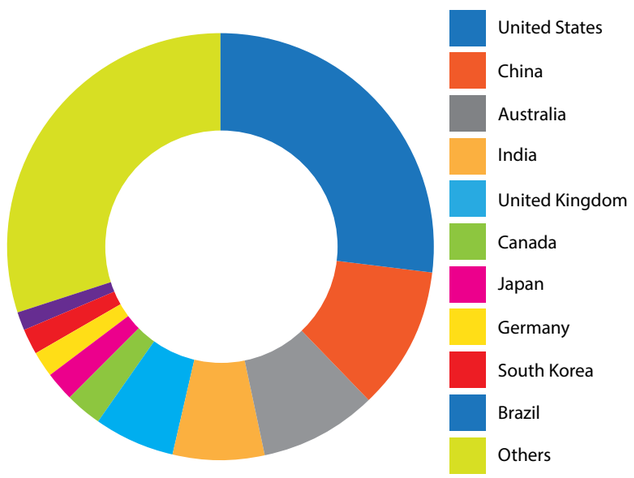


Figure 2: Top 10 downloading countries

Highlights from the CEO Journal

Victoria Cartwright, Managing Editor of *Clinical and Experimental Ophthalmology (CEO)*, has highlighted three not-to-be-missed technology articles from recent journal issues.

AI in Ophthalmology: Emerging issues in ethics and regulation

May/June Issue | RC Heath Jeffery and M Smith

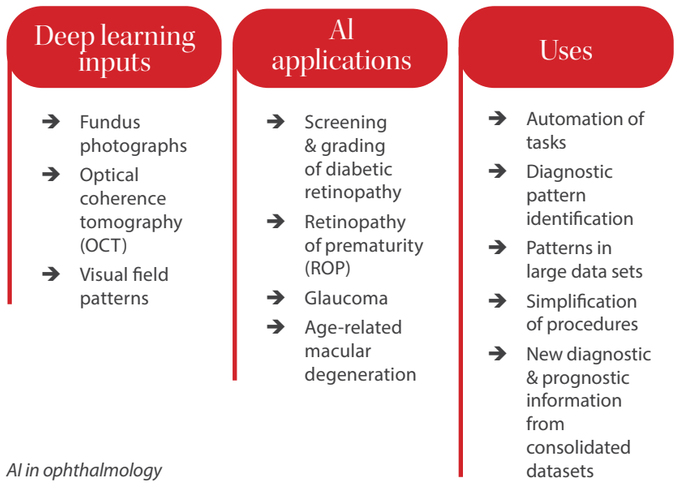
Artificial intelligence (AI) offers exciting possibilities for simplifying and automating procedures in medicine. In fact, the first ever autonomous AI diagnostic system to be approved by the FDA in any field of medicine was in ophthalmology.

"FDA authorized the system for use by health care providers to detect more than mild DR and diabetic macular edema, making it the first FDA authorized autonomous AI diagnostic system in any field of medicine, with the potential to help prevent vision loss in thousands of people with diabetes annually", Dr Michael Abràmoff of the Department of Ophthalmology and Visual Sciences at University of Iowa, USA wrote in the journal *Nature*.

As noted by Drs Stuart Keel and Peter van Wijngaarden in the *CEO Journal* 2019:

"The potential for these systems to improve patient access to timely and accurate diagnosis and clinical risk stratification needs to be tempered by risk controls around privacy and data security, as well as the need for ongoing human input into diagnosis and clinical decision making that presently lies at the centre of the doctor-patient relationship and which remains the foundation of health care."

Indeed, there are a growing number of AI applications and uses stemming from ophthalmological deep learning inputs (see below).



AI in ophthalmology

However, in a Letter to the Editor of the CEO Journal, Drs Rachael Heath Jeffery and Marcus Smith have outlined some of the likely challenges to be faced as the use of AI expands and develops in the field of ophthalmology.

One challenge is obtaining sufficient high quality and expertly labelled images to train AI algorithms. Another is keeping up to date with the changing regulatory environment, with the Therapeutic Goods Administration (TGA) in Australia holding public consultations in late 2018 and early 2019 to inform medical device regulation amendments. The resulting Amendment Regulations will introduce new classification rules for Software as a Medical Device (SaMD).

"The regulation of AI is also very challenging because of the black box problem," explained Rachael and Marcus.

"The exact methodology used by an algorithm cannot be fully integrated due to its complexity and the fact that it will continue to make more specific, individualised predictions and recommendations, adapting and becoming more complex as more data is incorporated."

The TGA proposes that any SaMD that diagnoses or screens for a condition that could result in death or a severe deterioration in health will be classified as Class III; any SaMD that diagnoses a condition potentially resulting in moderate risk to health will be Class IIb.

"Ophthalmologists should stay abreast of developments in AI and its regulation as it is likely to have a significant impact on the field in coming years," the authors noted.

Selective laser trabeculoplasty follow-up using self-administered tonometry

April Issue | MS Awadalla, A Qassim, M Hassall, TT Nguyen, J Landers and JE Craig

Promising findings show that patients can successfully use Icare® HOME tonometry to monitor eye pressure following selective laser trabeculoplasty, facilitating safe follow-up in rural, remote and self-isolation settings.

A tonometry device for use at home enables IOP monitoring outside the clinic and also facilitates continuous monitoring. The Icare HOME device uses rebond measuring with a single-use probe and requires no anaesthetic drops. Importantly during the COVID-19 pandemic, the device does not use an air puff which can create micro-aerosols and risk cross-contamination. It takes around 20 minutes for most patients to be taught how to use the device.

A study published in the April issue of CEO reported on 14 primary open-angle glaucoma patients undergoing SLT (mean age 65 years). Each patient enrolled in the study was trained to ensure they were able to position the device correctly and obtain two accurate measurements on their own. Patients took four measurement per day (morning, afternoon, evening and before bedtime) for a week before and a week after SLT.

The researchers reported that all patients were able to successfully obtain IOP measurements using the Icare device. Using the patient self-measurements after SLT, a statistically significant reduction in mean IOP of 5.12 mmHg was observed. On the first day following SLT, self-administered tonometry recorded a mean IOP reduction of 63%. Fluctuations in IOP were significantly reduced by an average of 24%, no IOP spikes were recorded and no adverse effects were reported.

It has been reported that greater fluctuation in IOP may be associated with glaucoma progression. Thus, accurate and frequent IOP measurements at different time points are imperative," explained Dr Mona Awadalla and colleagues from the Department of Ophthalmology at Flinders Medical Centre, Adelaide.

"To our knowledge, this study is the first to look at the role of Icare HOME tonometry on post-SLT follow-up," explained Mona.

While Goldmann applanation tonometry (GAT) is the gold standard for assessing IOP, the usual twice a year outpatient appointments may not adequately capture patients who have rapidly progressing glaucoma.

Machine learning for triaging ophthalmology outpatient referrals

March Issue | Y Tan, S Bacchi, RJ Casson, D Selva and WO Chan

A new pilot study conducted at the South Australian Institute of Ophthalmology has found that deep machine learning can accurately assist with prioritising and triaging referrals.

Dr Yiran Tan and colleagues at Royal Adelaide Hospital used the text component form 208 outpatient ophthalmology referrals from GPs, optometrists, specialists and emergency departments.

Patients were triaged into three categories: 1) appointment in < four weeks; 2) appointment in one to three months or 3) appointment in > three months.

Convolutional neural network (CNN) was the best performing model, with 81% accuracy at separating the most urgent category one referrals from the other less urgent referrals.

"Our results demonstrate that machine learning, in particular deep learning, can accurately assist with the triaging of ophthalmology referrals," the researchers said.

"A system could be developed that would flag certain referrals definitely requiring a category one prioritisation (with high specificity and positive predictive value)."

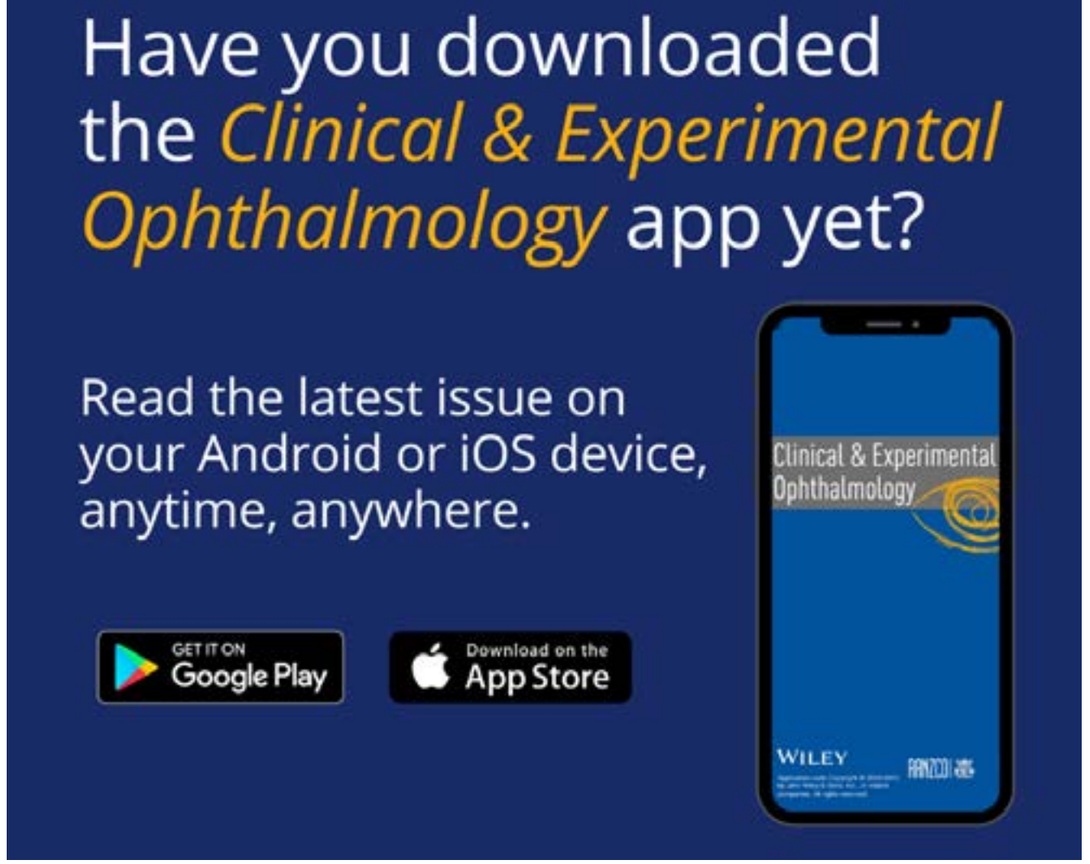
"Our pilot study is distinct as we demonstrated with a relatively small sample size that natural language processing (NLP) can accurately identify urgent referrals from the full unfiltered spectrum of clinical ophthalmology referrals instead of just a specific disease process," the researchers said.

The research team also noted that further larger studies were required and future research should focus on data from multiple centres.

Read more here:

Ruth Hadfield

References are available upon request. Please email RANZCO.



Branch Musings

New South Wales

CHAIR:
Diana Farlow
VICE CHAIR:
Alina Zeldovich
HON TREASURER:
Nisha Sachdev
COUNTRY VICE CHAIR:
Neale Mulligan

The editorial brief from the Communications Team at the RANZCO Head Office for this article was technology and isolation and how I, personally, and the Branch, were coping. I feel very fortunate to be an ophthalmologist. I have been going to work three to four days a week so I leave the house and interact with staff and patients. Of course, I'm seeing fewer patients. A couple of new patients with urgent problems commented that it was weird being treated for a serious problem by a doctor whose face they have never seen because it was hidden behind a mask.

I've made use of telephone consultations. Patients really appreciate this service, especially the elderly, many of whom have had strict instructions from family not to leave their homes but are concerned about the vision risks by not attending their routine appointments. For those that really need to be seen, I have been able to reassure them that the practices where I work are following strict infection control measures. This alleviates a great deal of anxiety. I've also been in contact with a number of GPs by phone. The conversations have strengthened professional relationships and it's been interesting to learn how they are coping. One GP group practice located in a small city terrace house with rear lane access and a courtyard maintains social distancing by performing minor procedures like vaccinations and blood collection outside in the courtyard (weather permitting). This frees up room inside the building. The receptionists open the windows to the courtyard from their office for the paperwork so the waiting room head count is not breaking social distancing rules.

The Branch had its first virtual meeting on Wednesday 1 April via Zoom. It worked really well and we ran to time. We welcomed two observers: Dr Alok Sharma from Wagga, on the Work Force Committee, and Dr Parth Shah, Sydney paediatric ophthalmologist.

The items discussed were:

- No increase this year on the NSW RANZCO membership fee,
- Branch donation of $100,000 to ORIA,
- Cataract surgery simulators and how best to obtain two more for NSW.

Dr Alina Zeldovich, Vice Chair, organised for Lyndall Humphries, Senior Employment Lawyer and Jessica Rankin, Workplace Relations Team Leader from NSW AMA to join the teleconference to discuss the impact of the COVID-19 pandemic and issues such as work health and safety, employee obligations, business continuity and business downturn. Both were working from home.

The Branch will trial a Virtual Journal Club, initially with committee members. If popular and successful, it will be opened to NSW Fellows.

Lastly, following up on the newly named Medicolegal Advisory Group of NSW, Dr Michael Delaney, current Chair, will be handing over the reins to Clinical Prof Frank Martin at the NSW Branch AGM. Michael will provide ongoing support for the group and continue his routine medicolegal practice and clinical practice. Please refer to the EOI notice on the right and in the bi-weekly RANZCO e-news.

Dr Diana Farlow

Medicolegal Advisory Group of NSW seeking NSW Fellows

Under the Chairmanship of Dr Michael Delaney, the Medicolegal Advisory Group of NSW consists of Fellows who make themselves available for expert opinions in cases of medical litigation, workers compensation and motor vehicle accident impairment assessment. The Chairmanship will transition to Clinical Prof Frank Martin at the NSW Branch AGM this year. Dr Michael Delaney will provide ongoing support as well as continue his routine medicolegal work and clinical practice.

For worker's compensation and motor vehicle impairment assessments, some basic familiarisation of processes will need to take place, including obtaining knowledge of the American Medical Association's Guides to Impairment Assessment Edition IV. Following that, an application to the State Insurance Regulatory Authority (SIRA) is required for accreditation as an Authorised Health Practitioner.

Further information can be obtained by contacting Dr Michael Delaney. If you have the appropriate expertise and are interested to apply, please email ranzco@ranzco.edu.

Closing date: 7 September 2020

Queensland

CHAIR:
Stephen Godfrey
VICE CHAIR:
Mark Chiang
HON SECRETARY:
Alison Chiu
HON TREASURER:
Oben Candemir

The second quarter issue of *Eye2Eye* has a much different landscape from the summer edition. We now find ourselves with teleconferenced journal clubs and registrar training. We 'Zoom' in for state branch meetings and the surgical side of ophthalmic practice is curtailed as with all areas of medical practice.

All this results in a very short report this quarter. The most significant negative is the cancellation of the Annual Congress in Brisbane this October 2020. There has been a massive amount of preparation which has been stalled. We thank the organisational committee of Drs David Gunn, Katie Chen and Abhishek Sharma for their hard work. Hopefully this just adds to the Congress 2021 in Brisbane.

There has also been severe exam upheaval and we find ourselves zooming in for RACE examination meetings. All in all, it's a surreal time and we can only hope for rapid resolution.

Unfortunately, Queensland has once again farewelled one of its most senior Fellows. Dr Brian Wilson, a towering figure in Queensland ophthalmology, passed away in March 2020. Brian was a Churchill Fellow and OAM recipient. He was a mentor to a generation of Queensland Fellows and leaves a massive legacy to the Australian College of Ophthalmology. Once again, we farewell him with gratitude.

The hope is that the virus will be stopped sooner rather than later. Our collegiate hope is that we are able to report a lot better situation in the third quarter of *Eye2Eye*.

Dr Stephen Godfrey

New Zealand

CHAIR:
Peter Hadden
HON SECRETARY & TREASURER:
Kenneth Chan

It has been a busy few months for the NZ Branch, dominated of course by the coronavirus. I still feel we have achieved quite a lot especially compared to other specialties in New Zealand, such as orthopaedics. We have engaged with ODOB and NZAO to develop guidelines for optometry during this time, the College has published triage guidelines which we have modified for the NZ situation and we worked with the Ministry to develop guidelines for Level 3 while other groups are struggling. We have also set up a subcommittee to look at how we can use telehealth and produce guidelines in this regard and they have released an app that allows for contact tracing within practices. We have been made aware that the Private Hospitals Association of New Zealand has been lobbying for extra funding from the New Zealand government and have lobbied the Ministry of Health to consider day stay eye surgery centres that are not part of this organisation in any funding deal.

Outside coronavirus, immediately prior to the lockdown, David Andrews, Philip Polkinghorne and I met with ODOB in Wellington and we also got some newspaper exposure regarding inequities in access to DHB-funded eye care around the country. Unfortunately, we had to cancel our branch meeting this year, but will have it in the same location – Christchurch – next year and Nelson the year after that. We shall have an online AGM.

I'm sure too, that like everyone else, we shall be looking forward to getting back to life as normal!

Dr Peter Hadden

RANZCO 2021 BRISBANE
19-23 November 2021

Local & International Invited Speakers

Dame Ida Mann Memorial Lecture
Prof Alex Hewitt

Sir Norman Gregg Lecture
Prof Graham Barrett

Fred Hollows Lecture
Dr Catherine Green

Council Lecture
Dr Clare Fraser

Neuro-ophthalmology Update Lecture
Dr Lynn K Gordon MD

Cataract Update Lecture
Mr David Lockington

Retina Update Lecture
Dr Anita Agarwal MD

Glaucoma Update Lecture
Dr Pradeep Ramulu MD

Refractive Update Lecture
Dr Damien Gatinel MD

For all Congress details visit www.ranzco2021.com

Continuing Professional Development

Mandatory Notification Requirements for RANZCO Fellows and Trainees in Australia

Notification is the term used when you notify the Australian Health Practitioner Regulation Agency (AHPRA) about a concern that a health practitioner may be putting public safety at risk. By law, registered health practitioners, employers and education providers must make a mandatory notification in some limited circumstances. On 1 March 2020, the requirements to make a mandatory notification changed. AHPRA hopes these changes support health practitioners seek help about their health without fearing a mandatory notification.

In this article, we explain what this means for you as a medical practitioner or an employer. Separate requirements apply for education providers.

Under the National Law, the requirements and the threshold of your concern for mandatory notification varies depending on:

- your role as a treating or non-treating practitioner; and
- whether you are notifying about a health practitioner, which includes RANZCO Fellows and trainees, or a student who is registered as a student with their respective national board.

If you are an employer, you must notify about health practitioners but are not required to do so for students.

These guidelines do not affect other legal mandatory reporting requirements, e.g. child abuse.

Concerns that need to be reported and their definitions

There are four concerns that you are required to consider when making a mandatory notification to APHRA:

Impairment: A physical or mental impairment, disability, condition or disorder (including substance abuse or dependence) that detrimentally affects or is likely to detrimentally affect the person's capacity to practice the profession.

Intoxication while practising: Under the influence of alcohol or drugs. 'Drugs' include illicit drugs, prescribed and over-the-counter medicines.

Professional standards: Practice and professional behaviour based on the standards for that profession. Refer to documents such as the RANZCO Code of Conduct and the Medical Board of Australia's *Good medical practice: A code of conduct for doctors in Australia* to judge whether there has been a significant departure from accepted practice and professional behaviour.

Sexual misconduct: Sexual misconduct in connection with the practice of the practitioner's health profession and with people under the practitioner's care or linked to the practitioner's practice of their health profession. It includes:

- sexual activity with a current patient or client, whether or not consent is given;
- making sexual remarks;
- touching patients or clients in a sexual way;
- touching a patient in an intimate area without a clinical indication, whether or not consent is given; and
- engaging in sexual behaviour in front of a patient or client.

Refer to the table on the next page for your mandatory notification requirements based on your relationship with the registered health practitioner. As a medical practitioner, you have a professional and ethical obligation to protect and promote public health and safety, so you may consider whether to make a voluntary notification about a concern where the mandatory notification requirements do not apply to you. Any individual or organisation can make a voluntary notification about a registered health practitioner or student's health, conduct or performance.

Your role	Concerns about registered practitioners that you need to make a mandatory notification			
	Impairment	**Intoxication while practising**	**Significant departure from accepted professional standards**	**Sexual misconduct**
Treating practitioner*	Practising with an impairment placing the public at risk of substantial harm.	Practising while intoxicated by alcohol or drugs, placing the public at substantial risk of harm.	Significantly departing from professional standards placing the public at substantial risk of harm.	Have engaged in, are engaging in or might engage in sexual misconduct connected to their practice.
Non-treating practitioner or employer	Practising with an impairment placing the public at risk of substantial harm.	Practising while intoxicated by alcohol or drugs.	Significantly departing from professional standards placing the public at risk of harm.	Engaged in sexual misconduct connected to their practice.

**Exempt in WA*

You do not have to make a mandatory notification if you reasonably believe someone else has already made a notification. If you practise in Western Australia and are the treating practitioner, you are exempt from mandatory notification requirements.

There are several other circumstances where you are exempt from mandatory notification requirements as a treating or non-treating practitioner where you:

- form the belief from a disclosure in the course of a legal proceeding or the provision of legal advice arising from an insurance policy, where you are employed or engaged by the professional indemnity insurer;
- form the belief while providing advice about legal proceedings or the preparation of legal advice;
- are exercising functions as a member of a quality assurance committee, council or other similar body approved or authorised under legislation which prevents disclosure of the information.

Reporting thresholds

To make a mandatory notification, you generally need to form a reasonable belief which means you need direct knowledge of the incident or behaviour that led to your concern. The notification cannot be based on rumour, suspicion, gossip or speculation. Most importantly, if you are the treating practitioner, the threshold for reporting a concern about impairment, intoxication and practice outside of professional standards has been raised to **'substantial risk of harm'** to the public.

The Mandatory Notifications guidelines require you to make your own judgement on the level of risk of harm. You need to consider factors including but not limited to practice context, oversight and incident reporting depending on the circumstance. You may also want to consider other factors such as the frequency of the event when reporting about practising while intoxicated and the extent of self-reflection when reporting about significant departure from professional standards. You must report past, current and future risk of sexual misconduct that is connected to the practitioner's practice.

Refer to the guidelines at AHPRA for decision flowcharts and specific examples.

If you are unsure about a specific circumstance, you are advised to seek advice from your professional indemnity insurance provider or a legal advisor.

RANZCO CPD Team

CPD APP

Benefits to downloading the CPD App:

- A great and convenient way to enter CPD activities and points
- Includes searchable options to find CPD activities
- Auto-populates your points and CPD categories when you select a CPD activity
- Tracks your CPD activities and points in real time
- Allows you to enter CPD activity offline and will automatically sync to your online CPD Diary once connected to internet

Download the RANZCO CPD App on your mobile now!

iPhone Android

Fellows may log into the app using your RANZCO username & password (same with RANZCO portal).

QUEEN'S BIRTHDAY 2020 HONOURS

A big congratulations to two of our Fellows who were awarded the Medal of the Order of Australia in the Queen's Birthday Honours granted on 7 June 2020:

Dr Harold Paul Spiro
for the service to paediatric ophthalmology

Dr Arthur Michael Briner
for service to the Jewish community and ophthalmology

RANZCO CPD ACTIVITIES

The following activities and resources are available through the RANZCO Learning Management System (LMS) for you to acquire CPD points.
Completing a reflection of any reported activity attracts an additional 5 CPD points.

ACTIVITY	DESCRIPTION	CPD POINTS
Webinar series	Ten-week webinar series targeted for trainees but is open to all members. You can participate in the live webinars or view the recorded versions.	1 point Category 1, Level 1 Complete the webinar evaluation form to claim your points. Points will be entered in the CPD Diary by College staff.
Clinical Audit	The RANZCO Clinical Audit Tool (RCAT) provides a simple platform to manage your clinical audits. You can also participate in Fight Retinal Blindness! Audit and ANZSRS Retinal Surgery Audits. If you do not have current patients who meet the eligibility for audit due to the COVID-19 pandemic, you can do a retrospective audit. Go to screencast.com for a video on how to add information on RCAT about patients you have previously seen.	30 points Category 1, Level 2
Office Record Review (ORR)	Involves the retrospective audit of a patient's medical record. There are 27 ORR Excel templates, each of which pertains to an ophthalmic diagnosis with a specific definition and time frame requirement.	10 points Category 1, Level 2 You can claim up to 30 points in a CPD year.
Surgical Audit	Surgical audit is a systematic critical analysis of surgical performance and outcomes. Templates are available for 10 procedures.	30 points Category 1, Level 2
Workforce Survey – Fellows only	A 25-minute survey that focusses on issues relevant to ophthalmic practice, seeking to understand the current state of ophthalmology in Australia and in New Zealand and thereby enabling RANZCO to advocate for members on a range of policy issues.	1 point Category 2, Level 1
Learning Modules and Resources		Category 3, Level 1
	• Cultural competency	3 points
	• Ophthalmology-focussed cultural awareness modules (videos may be slow to load)	2 points
	• Intercultural learning modules online	2 points
	• Communication and consent issues with Aboriginal Patients - CICM	2 points
	• Social and professional responsibilities	1 point
	• Operating with respect	1 point
	• Telehealth module	2 points
	• RANZCO Leadership Development Program – self-directed projects and resources	1 point/hour

For a more detailed list with links, please scan this code using your mobile phone's camera app:

Member Profile

John Grigg

We caught up with RANZCO Fellow Prof John Grigg via Zoom and talked to him about his various interests and endeavours, the future of paediatric ophthalmology treatment and his commitment to gender equality.

"To advance, we need all hands on deck to contribute. This means not excluding any group. When these conditions exist, the outcomes are greatly improved."

Q: You have so many interests including paediatric ophthalmology, glaucoma and inherited eye diseases. How do you manage to keep abreast of developments in all these fields?

A: You can think of these interests as sort of vertical, encompassing all age groups. The interest started with paediatric ophthalmology and then I eventually gained interest with fields across all ages. I've been lucky with the training I've had and the people I've worked with who worked that way as well. I think in Australia we're really lucky because in the surgical perspective, people in paediatric ophthalmology have really high standards because they still do adult cataract surgery. Because paediatric surgery is more complicated than adult surgery, you can apply the skills and knowledge to cataract, glaucoma and other inherited eye diseases. I find my interest in paediatrics and glaucoma to be an overlapping thing. And knowing that most of it is inherited, that's where the interest in inherited eye disease comes from.

I've taken advantage of people as they have come along to learn from them for the different things I do. It's an eclectic group of things and some people can't pitch and hole me as to what my interest might be. My goal is that when you've got somebody sitting there with a complex eye disease and they're losing their vision, the question you ask is "Why?", and that's how I've put together the skills to try and help unravel that.

Q: What do you think the future holds in terms of treatments for kids with genetic eye disease? How do you think we'll get there?

A: Looking at the effects of genetic eye diseases on children before school through to retirement, you would see that the child who has vision impairment may not be fully blind but you'll find that in their 40's and 50's, that's when they lose all their sight — they lose their jobs, they can't drive and it's having a devastating impact on their lives. That's the hard-to-beat argument that will be used to justify why we need to treat these people. It's a complex process. There's a whole series of steps. We've got to help make sure that we have good quality eye care so working with the College, networks of people from across the country and health departments is how we're going to achieve this.

The challenge with inherited retinal diseases is there are about 260 different genes and so each one would require its own specific therapy. The RANZCO Guidelines for Inherited Retinal Diseases (IRD) went live on the website on 7 May. I chaired that committee and Prof Robyn Jamieson is the Chair of the genetic side. We had great contributions from Australia and New Zealand ophthalmologists and geneticists. That will provide the template for how we should manage people with inherited retinal disease. It's a really huge achievement for us as a College and for people who look after inherited retinal disease.

Read more on the RANZCO Guidelines for Assessment and Management of Patients with IRD here:

Q: Can you talk about the people who you look up to as mentors?

A: I was lucky with the mentors that I had. I was a Professorial Senior Registrar at the Sydney Eye Hospital, and there were four people who really served as my mentors. One of them was Prof Frank Bilson who was a paediatric ophthalmologist in glaucoma and was also my influence around the electrophysiology service, which was important for developing the phenotypes for inherited retinal disease. There's Prof Frank Martin, Prof Ravi Thomas and then Dr Kathy McClellan who had a particular interest in corneal and was exceptional in external eye diseases. She understood the importance of having really strong fundamentals in clinical observation.

Prof Peter McCluskey has also been a very good friend and mentor in leadership and we've worked very closely together.

Q: Have you achieved balance in your life?

A: I enjoy travel, travel photography, cooking and gardening. It's more gardening than travel at present.

I fit clinical work during the day, one and a half days of private practice and two hospital clinics a week, and six operating sessions a month.

I try to achieve balance by trying to get home by 7PM. I take the dog for a walk and then we share the cooking in our household. On weekends, we try to have one day off to do some exercise and go out.

Q: When did the commitment to gender equality start?

A: It started subconsciously for as long as I can remember.

I've also been inspired by my wife, Prof Robyn Jamieson. She's Professor of Genomic Medicine, head of a university department and runs a lab. I've observed the outcomes that come from support providing a useful perspective.

I've always worked in teams and there's been excellent women in those. In our work, there are many opportunities and or requirements to contribute to managing or advancing the endeavour. All of us have different talents and strengths. To address challenges may require multiple viewpoints as well as many contributors. In a relatively small specialty such as ophthalmology, the demands remain the same but the responders are fewer. To advance, we need all hands on deck to contribute. This means not excluding any group. When these conditions exist, the outcomes are greatly improved.

Prof John Grigg and his wife Prof Robyn Jamieson

Younger Fellows Educational Travel Scholarship 2019

supported by RANZCO and Johnson and Johnson Vision

A/Prof Clare Fraser reports back on her experience at the North American Neuro-Ophthalmology Annual Meeting at Amelia Island, Florida in March.

A/Prof Clare Fraser representing Australian ophthalmology at the NANOS banquet

The North American Neuro-Ophthalmology Annual Meeting is the key conference in the world of neuro-ophthalmology. While typically, the meeting attracts over 800 registrants, the numbers were lower this year as a result of COVID-19 travel restrictions. Despite this, the conference was still a fabulous experience and a great way to network with my mentors and colleagues from fellowships, and to make new friends.

On the first day of the conference, the 'Hot Topics' session was probably one of the most well-attended. This year, the organisers had scheduled an update on the potential trigger factors for non-arteritic anterior ischaemic optic neuropathy (NAION). I was invited to give a short update on the potential role of obstructive sleep apnea (OSA) in NAION. I first became interested in the role of OSA while on my fellowship at Emory Eye Centre in Atlanta, USA. Since returning to Australia, I have continued with my work exploring the link between OSA and vascular changes in the eye. The lack of oxygen caused by airway obstruction at night may be one of the only treatable causes of NAION. I demonstrated in my talk that there was a reasonable pathophysiological link between what happens to the body with OSA and NAION. I also showed the literature that confirms the increased risk of NAION in those with OSA and vice versa. Finally, I outlined the evidence that treating patients with OSA does mitigate the risk of NAION.

In addition to the 'Hot Topics' session, I was the co-organiser for the International Relations Committee (IRC) symposium for NANOS. Over 30% of NANOS attendees are not from North America so as the Vice Chair of the IRC, I felt it was important that our international attendees have a chance to speak in their area of expertise and provide some insight into how certain conditions differ outside of the USA. The session was well-attended with talks on vaccine-related optic neuritis, the various food-borne illnesses that can affect the eye and brain, and a discussion on the risks of long haul flights.

To top off an already great conference, Dr Jenny Hepschke won the award for the Best Presentation by a Trainee, for her presentation on our visual snow research project.

I would like to thank Johnson & Johnson Vision, as well as RANZCO, for their support. At the NANOS banquet, those who were given grants to attend the meeting were announced and recognised onstage by the President of NANOS, Dr Andy Lee. And yes, someone did hand me an Australian flag as I went onstage – so I was very proud to represent Australian ophthalmology!

A/Prof Clare Fraser
FRANZCO, NSW

L-R: Drs Julie Falardeau, Clare Fraser, Howard Pomeranz, Anthony Arnold, Nancy Newman, Susie Mollan and Valeria Biousse

Fighting Eye Cancer at Wills Eye Hospital with Dr Carol and Dr Jerry Shields

Travelling Scholarship 2018 Update – Dr Li-Anne Lim talks about her ocular oncology journey at the Wills Eye Hospital in Philadelphia under the mentorship of Dr Carol and Jerry Shields.

Li-Anne with Drs Jerry and Carol Shields

"It is only by doing the basic things well that fancy modern advances in technology and therapeutics can enhance our ability to care for patients with life and sight threatening tumours"

It was at the best International Society of Ocular Oncology conference ever held in Sydney 2017 that my journey towards a career as an ocular oncologist would begin. Fortunately, right on my very own doorstep, I was introduced to the "all-stars" of ocular oncology by our very own local hero, Dr Michael Giblin, and was inspired to join this team of superheroes, Drs Carol and Jerry Shields, who were fighting eye cancer at Wills Eye Hospital, Philadelphia, USA.

As an unfunded fellowship, the generosity of the RANZCO Travelling Scholarship turned an aspiration into reality, catapulting my husband and 18-month-old son on a trans-Atlantic adventure to the home of the best cheese steak, cream cheese, American football team – the Eagles, Amish bakeries and ocular oncology and pathology. Philadelphia is America's home of firsts: the first hospital, library, medical school and theatre; and so it was that I was to become a part of Wills Eye Hospital, "America's First, World's Best".

In the city of brotherly love, on the cold and icy spring morning of March 2018 at 6:30 am, I walked down Walnut Street in the dark to enter the hallowed walls of Wills Eye Hospital Level 14 to begin a wild and wooly ride, as an Ocular Oncology Fellow at Shields and Shields. Along with fellows from Mexico, China, Utah and Minnesota, our days were filled seeing some 30,000 new patients from across the United States and abroad with lumps, bumps and simulating lesions. Days turned to weeks as we traversed the clinics, operating room, the chart room collecting data and early morning clinical rounds, learning, observing and soaking up every pearl, skerrick, tip and trick. From counselling a choroidal melanoma patient for plaque treatment to doing a fine needle aspiration biopsy of an intraocular tumour or marking a four-month-old baby's eye for intra-arterial chemotherapy to treat retinoblastoma, there was no shortage of interesting cases and never a dull moment.

This plethora of pathology was our stomping ground to engage in clinically relevant research, with the opportunity to formulate our own questions which we aimed to answer through research that we saw through from infancy to publication. I was mentored and shaped into a scientific writer as I worked with my colleagues to supervise medical students writing case reports and publish on large series of retinoblastoma, Coats' disease, choroidal melanoma and vitreoretinal lymphoma. The most fulfilling achievement of all was finding meaningful answers to our clinical questions that would later shape my own thinking and practice of ocular oncology.

Learning from Carol and Jerry, I truly came to appreciate the art of medicine and the importance of attention to detail, efficient patient care, and the need to have well-sharpened coloured pencils. Although I was fortunate to become well-versed in the utilities of multimodal imaging and modern therapeutics including chemotherapy, plaque brachytherapy and intra-arterial chemotherapy that now dominate the ocular oncology work space, I came to learn the surprisingly simple truth: That at the end of the day, nothing can replace an accurate history and indirect examination documented on a coloured retinal drawing. It is only by doing the basic things well that fancy modern advances in technology and

Shields Fellows

therapeutics can enhance our ability to care for patients with life and sight threatening tumours.

Living in the historic city of Philadelphia, down the road from Liberty Bell and Independence Hall where America first began, I also had the privilege of meeting a few of the very people who carved and moulded ocular oncology into an independent speciality of its own. That very year, Jerry was honoured for his contribution to ophthalmology in his own issue of the journal *Retina*, while this year, Carol was named the Number One Most Influential Ophthalmologist in the World on the power list. It was pure luxury and really downright indulgent to be able to amble next door to discuss the pathology of a case with the one and only Dr Ralph Eagle. To top it all off, I had the pleasure of dining with the now late Dr Luther Bracy, who together with Jerry, perfected the technique of plaque brachytherapy, as well as Dr Anna Meadows who pioneered chemotherapy for retinoblastoma.

In my time spent not being awestruck by the achievements of those in my midst, I was able to ponder my thoughts alongside the statue of the "Thinker", walk the halls of the Philadelphia Museum of Art and enjoy the bright lights of New York City just a short bus ride away. Weekends away were spent learning about the Amish way of life in nearby Lancaster, enjoying the Jersey Shore and visiting the honourable Mr Donald J. Trump in Washington, D.C.

As Philadelphia became our home away from home, we enjoyed upsized North American culinary delights, freezing "Noreaster" snowstorms in spring, and scenic walking trails across the city that ended with a sprint up the iconic Museum of Art's staircase – of course, exactly like Sylvester Stallone in the movie "Rocky". In addition, I was able to attend and present at ophthalmology meetings both global and local. I met the alumni of the other Wills Eye Oncology Fellows at the 9th Wills Eye Intraocular Tumour Symposium where we "oohed" and "ahhed" over cases describing the good, bad, ugly and outlandish. Our own homegrown Dr Michael Giblin, who was Jerry's very first Fellow some 30 years ago, also visited me and together we attended the American Academy Meeting in Chicago as well as a fantastic up close magic show at a magic club complete with a secret door behind a laundromat façade. January brought the yearly Atlantic Coast Retina Meeting in Boston amongst the likes of Dr Yannuzi and Dr Freund. Needless to say, presenting my "interesting case" in such company was nail-biting!

At the end of the day, it was my husband and mother who looked after my 18-month-old son day in and out. They did the real hard work. I just got to look at interesting tumours and cases all day long alongside experts in the field, make amazing friends from across the globe and fight eye cancer. For that, I am truly grateful.

Dr Li-Anne Lim
FRANZCO, NSW

Li-Anne with son Gabriel in Philadelphia

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Softgels vs Tablet Formulations

There has been some discussion as to the benefits of tablet formulations vs softgels when treating macular health.

BIOAVAILABILITY

- The bioavailability of formulations between tablets and capsules has been compared.
- Zinc absorption between tablets and softgels was shown to be largely similar with bioavailability being slightly improved in the softgel form[1].
- Lutein and Zeaxanthin were given in tablet form, all other ingredients including zinc were provided as softgels in recent clinical studies.
- Once a Day Macutec has a significant benefit over the two per day tablet products.

PATIENT COMPLIANCE

- Studies and analysis has shown that only between 1% and 18% of patients are fully compliant with 2 per day dosages [2&3].
- Labeling on the 2 per day products directing patients to take 1 per day is confusing.
- Prescribing a 2 per day product will likely result in the patient receiving a non-therapeutic 50% dose.

www.macutec.com.au

[1] Bioavailability of micronutrients from softgel capsules and tablets: a pilot study Molecular Vision 2014; 20: 1228-1242. [2] Stiltec in-house data based on patient usage follow up. [3] Ng WT, Goggin M., Clinical & Experimental Ophthalmology 2006 Jan-Feb;34(1):9-14
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Health and Wellbeing

Health and Technology in Isolation

We asked some RANZCO Fellows on what their go-to technology has been in this time of isolation to combat cabin fever, promote good health and mental wellbeing.

Diana Semmonds

What: An E bike!

Why: I have been riding a road bike for a few years now – just at weekends if I get the chance.

Once a year, I do a bicycle ride for a week with a group in Europe. Prior to this, I try and increase my bicycling miles but I never reach the level and fitness of my companions. Over the last few years I have refused to ride the mountains as I get left behind and, on occasions, lost.

How: I am now able to ride the hills and when my legs or chest gives in, I turn the engine on for a few minutes and power up the steepest bits then settle back into my own pedalling. This technology has now become cool.

"The idea of an E bike brought thoughts of 'failure', 'old people' and 'not cool'. However, my rides were becoming limited so I decided to ride an E bike but to not turn on the engine unless essential."

Andrew Chang

What: Kmart Air fryer

Why: Ensures peace in a time of chaos.

How: Child 1 is a KFC aficionado, child 2 is philosophically opposed to eating chicken and loves tofu. The air fryer enables a roster system, alternating fried chicken and fried tofu. Safe and accessible care for all stakeholders and almost guilt-free meals.

"The air fryer is jet black, sleek with an inspiring engine note."

Nisha Sachdev

What: Zoom

Why: To continue my exercise journey in isolation. For my mental wellbeing, and to maintain my current fitness and to keep fit.

How: My running coach now organises a Zoom "catch up and workout". She sends us an email on the day to let us know what equipment we need, which usually is a yoga mat, water, tennis/cricket ball, foam roller resistance bands and weights (which can be wine bottles or a 5kg basmati rice bag in my case!). She instructs us on what to do by demonstrating the workouts live and corrects us as we go along. It allows us to connect with the all crew as we "normally" do on Monday nights. It's been great to see everyone, motivating us all and keeping us accountable.

"My running coach has continued her strength workouts virtually. Normally, we catch up in Kiribilli (under the bridge!) and do an hour of strength work in a beautiful location in Sydney!"

What: HouseParty

Why: To have a virtual hour party with friends all over the world.

How: It's an app that allows you to "host" a party. If you "lock" the door, then no one can enter! If you, however, keep your "door" open, then any of your friends can come to your house to join the party! Spontaneously!

It's a fun way of keeping in contact with everyone. I did different things with each of my groups of friends! Played trivia, "happy hour" drinks, birthday celebrations – the list was endless!

And, yes, it is a sign of the "times" but it was still so much fun connecting with everyone.

"I have lived all over the world and this was the best opportunity for me to catch up with my friends in the UK, NZ, Canada and around Australia!"

Health In Practice

The Practice Managers Advisory Group talks about their health and wellbeing initiatives in their respective practices.

"We do a practice run once a year, Jetty to Jetty, where staff can choose to walk or run (3k, 5k or 10k). After the run, we hold a BBQ together. We offer flexible working arrangements and healthy lunches provided every day."

Peggy Ekeledo-Smith
Moreton Eye Group, QLD

"We provide flu vaccinations and encourage wellbeing by having quarterly team conversations to ensure they are doing well. We have just established return from sick leave wellness catch ups to check in with how people are doing post sick leave. Generous training and professional development support is provided for our teams which includes attending the annual RANZCO events for some."

Deb Boyd
Auckland Eye, NZ

RANZCO Museum

Forging Links with India

At the invitation of the All India Ophthalmology Society (AIOS), I attended the national AIOS Congress in Delhi with 15,000 delegates! Following the Congress, several presentations were given by myself and Kirsten Campbell, Assistant Curator, on developing an online museum to project the work of the College and preserve its heritage. Fortunately, the Delhi air was clear and all travel was smooth, arriving home just before the COVID-19 crisis struck.

The AIOS Museum in Delhi, while small, has unusual artefacts on display including a carbon arc photocoagulator - pre-Xenon and an early vitrectomy device.

Travelling to Chennai, we lectured at the Elliot Museum situated in the Government Eye Hospital founded a year after Moorfields in 1819.

Elliot was an ophthalmologist in the Indian Medical service who, in 1913, developed the glaucoma operation by trephination. He was a polymath and superintendent of the hospital with interests ranging from magic to tropical medicine. He was an expert conjurer who became Chair of the Occult Committee of the Magic Circle on returning to London.

The long-term plan of the RANZCO Museum is to develop links with other ophthalmic museums in the USA and UK on the internet.

Carbon arc photocoagulator

Presentation of Aboriginal artwork to Prof Natarajan, AIOS President, from RANZCO

Government Eye Hospital Chennai (Madras)

Elliot trephines

70 Years Ago – Zeiss Xenon Photocoagulator

Meyer Schwickerath in Essen, Germany developed the Photocoagulator (PC) with Zeiss in 1950.

Preceded by the unreliable carbon arc machine, the Xenon PC produced an intense beam of light which focused on the retina. It was used to treat retinal tears, diabetic retinopathy and retinopathy of prematurity. An adaptor allowed treatment of surface lesions.

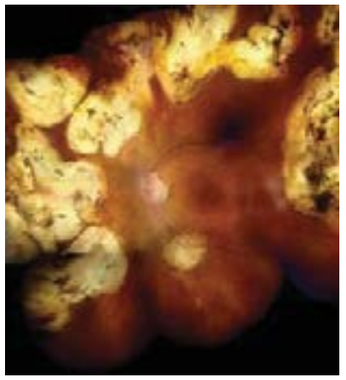
Dr Graeme Chester in Perth recalls using the machine in the 1970's at the Royal Perth Hospital. Termed 'Jumbo', whether affectionately or not, the large device delivered focused Xenon light produced by electrical discharge in a high pressure Xenon chamber. The beam delivery was enabled through a long tube to a direct ophthalmoscope head which swiveled. The tube could be moved in a limited fashion to treat the recumbent patient on a trolley. Cumbersome to use, with considerable difficulty to locate and treat peripheral lesions, it produced large intense burns that enlarged over time. Proliferative diabetic retinopathy presented new challenges as any vitreous blood absorbed the light with heat being produced. Treatments preceded the Diabetic Retinopathy Study, so initial protocols had not been established. Focal macular burns migrated in time, making results variable.

The burns were quite painful, limiting the treatments. Adjusting the patient's position to allow visualisation was limited by the adjustment of the delivery head.

Treating infants with ROP required general anaesthesia with an assistant rotating the eye to visualise the periphery. Nevertheless, Graeme acknowledges patients with useful vision decades after being treated as infants.

Meyer Schwickerath

Zeiss Xenon Photocoagulator



Retinal burns produced by Xenon Photocoagulator

Major Upgrade for the RANZCO Museum Website – Collections Viewing

The installation of iMu software has allowed a much improved display and search function of the artefacts in the Museum. This is viewed via the Collection tab on the RANZCO Museum website (https://museum.ranzco.edu).

The unfortunate cancellation of the RANZCO Congress in October has allowed for a lot of work to be done on developing presentations covering the history of the photocoagulator and Elliot's trephination for glaucoma.

The presentations and posters from 2019's 50th Congress are now on the Museum website.

Dr David Kaufman
Curator, RANZCO Museum

New collections page from the RANZCO Museum website

RANZCO | MUSEUM

Feature Stories

Gaming the System

The View from (somewhere near) the Middle

From Novice to Expert: The Story of a Zoomed-out Ophthalmologist

The Wonderful World of Virtual Meetings

The Use of Smart Phones in Ophthalmology

Rocking the Boat

Is Your Practice Protected from Cyberattack?

The Journey Towards AI-assisted Telehealth for Diabetic Retinopathy Screening in New Zealand

RANZCO Fellows Reap Benefits from Gaming

How virtual reality, simulation and gaming can enhance an ophthalmologist's skills.

Gaming impacts the brain – it improves motor control, enhances brain plasticity and cognitive performance, and alters brain structure and function. Research shows that gamers make better surgeons and the next generation of ophthalmologists are harnessing the power of gaming to improve their surgical skills.

There is growing evidence that commercially available video games improve cognitive function. Choi *et al* (2020) published a systematic review of 28 studies on the topic in the journal *Behavioral and Brain Functions* and concluded that video games "were found to be positively associated with cognitive function (e.g. attention, problem solving skills)".

There are five genres of video games: traditional games such as card and board games, simulation games such as sports or driving, strategy video games, action video games such as first person shooting, and fantasy games. Choi and colleagues at the Department of Psychiatry, Eunpyeong St Mary's Hospital in Seoul, Korea found that different genres conferred different improvements in cognitive function, with action video games giving the widest range of cognitive benefits.

Overall, gaming was positively associated with six different cognitive functions: attention, working memory, visuospatial function, probabilistic learning, language and problem-solving skills. Moreover, many different studies observed specific structural changes in the brain. For example, action video games were associated with greater plasticity of white matter networks in regions such as the prefrontal cortex that are important in cognitive control. Larger grey matter volumes were also observed in action video game players in the right hippocampus, right dorsolateral prefrontal cortex and bilateral cerebellum. Gaming was also associated with neural plasticity in regions of the brain used for navigation and visual attention.

RANZCO Fellows who are interested in gaming have appreciated these benefits firsthand. Dr Amy Pai started playing video games as a child but really got into gaming at university when she got a Playstation 2 as a birthday gift from friends.

"I enjoy playing games after work to help me relax and destress," said Amy.

"I think gaming has helped improve my dexterity, hand-eye coordination, visual attention and concentration, and potentially, reaction time," she said.

Similar benefits have also been observed by ophthalmologist Dr Matt Ball who is an avid PS4 virtual reality F1® (Formula 1) gamer.

"Driving 320km/hr in an F1 car really sharpens the concentration," said Matt.

"There are a lot of similarities between F1 and surgery. You have to use both hands and both feet, so in that sense, it is similar to cataract surgery. Posture is also very important – you need to relax your shoulders and keep your back straight which translates to surgery as well," he said.

Matt has also been inspired by two books *The Core: Better Life, Better Performance* and *Exponential* which is about the training philosophy of Dr Aki Hintsa, McLaren physician and F1 coach. In his lifetime, Aki helped at least 11 F1 drivers win Grand Prix titles by focussing training on physical fitness and mental wellbeing. Many of the principles of training F1 drivers and athletes can also be applied to training surgeons.

Aki's training philosophy, established when he was working in Africa with elite Ethiopian long-distance runners, is based on the premise that optimal performance requires a healthy, balanced life.

"Many surgeons participate in sport or yoga to help their performance – all of these types of activities translate to improved motor skills."

According to the Hintsa High Performance Institute: "Inspired, Dr Hintsa drew a circle and on the outer layer, he placed the following six elements: physical activity, nutrition, recovery, biomechanics, mental energy and general health. Then in the middle of the circle, he wrote the word "core". It represents identity, goals and control. This model would come to define the entire Hintsa philosophy."

"Many surgeons participate in sport or yoga to help their performance – all of these types of activities translate to improved motor skills. Surgeons should treat themselves like athletes and gaming is just another way that we can maintain and build on our skill set," said Matt.

In addition to evidence of the benefits of gaming on motor skills and cognitive function, there is also a body of research dedicated to gaming and surgical skills. RANZCO Fellow Dr Rahul Chakrabarti, based at The Royal Victorian Eye and Ear Hospital (RVEEH), recently conducted a comprehensive literature review on gaming in surgical and ophthalmology training.

A total of 39 papers on video gaming and surgery were identified in his review, covering the most recent five years of published literature.

"This is an emerging area in terms of surgical training and publication interest," said Rahul.

"Video gaming is often practiced as a recreational activity, but also offers photo-realistic simulation of various scenarios that require motor, visual and cognitive coordination. These attributes are highly desirable particularly in microsurgical specialties such as ophthalmology. Used judiciously, video gaming holds the potential for a beneficial effect on surgical training," he said.

While most of the publications focus on general surgical skills, in particular laparoscopic skills, there are some that specifically investigated ophthalmology training.

"Within ophthalmology, regular video game play enhanced baseline microsurgical performance measured on a surgical simulator," said Rahul.

There is even more evidence for the benefits of gaming in the area of general surgery.

"In one study, general surgery faculty and residents who systematically played video games for five weeks were found to perform better on laparoscopic simulations. In addition, those who played video games for six weeks performed better on a laparoscopic simulator than those who trained on the simulator itself for six weeks," said Rahul.

"There have been studies to show that those who play Nintendo Wii for a few hours for three days before using laparoscopic simulators perform better in the non-dominant hand on the simulator compared to those who did not," he said.

Rahul also highlighted a 2007 study by Dr James Rosser, Jr and colleagues at the Department of Surgery in Beth Israel Medical Center and New York University Medical Centre. In this study, trainee surgeons were asked about their video game usage and tested on video game ability. They then performed a series of standardised laparoscopic drills and suturing on porcine bowel. Surgeons who had played video games three hours per week made 37% fewer errors, were 27% faster and scored 42% better overall than trainees who had no video game exposure.

"Surgeons should treat themselves like athletes and gaming is just another way that we can maintain and build on our skill set."

Another of the studies Rahul reviewed was authored by Dr Jeremy Lynch, Department of Surgery at the Royal Sussex County Hospital. Writing in the *Journal of Surgical Education* he notes:

"…there is a need to search for factors that improve surgical technique outside of the operating theatre. There is some evidence that those with extensive prior video game usage have superior visuospatial ability. Younger surgeons seem to acquire skills in laparoscopic surgery more easily than older colleagues and increased video game usage in this population is one possible explanation."

"It is important to emphasize that manual surgical technique is just one of the competencies that it takes to become a good surgeon and clinical outcomes are strongly influenced by interpersonal communication skills and good judgment," wrote Jeremy.

Dr Sarah Gentry, from the School of Public Health, Imperial College London, has made similar conclusions in a recently published systematic review of 30 clinical trials of serious gaming published in the *Journal of Medical Internet Research*.

"Results from our review show that serious gaming/gamification in pre- and post-registration health professions education could result in increased knowledge, skills, and satisfaction when compared to traditional education," noted Sarah.

So with all this evidence supporting gaming, should we all be taking up this new hobby? Rahul notes:

"I think it's pertinent to remember that gaming is ultimately a form of entertainment. There is no specific one game or console that has been shown to improve surgical skills for consultants (or non-trainees). There is limited evidence to suggest it actually improves patient outcomes in live surgery, but perhaps indirectly through performance on a simulator."

"By the time one is a consultant, bimanual dexterity and motor skills are established and it doesn't take long for those aspects to be regained. It may be the mind skills aspects that a surgeon is looking to excel or refine in order to maintain or progress to becoming an expert. In that sense, video gaming may not be the highest yield. In fact, greater benefit may come from peer-to-peer coaching, discussing cases especially complicated ones with other consultants and objectively self-reflecting," said Rahul.

"So I wouldn't be necessarily recommending starting gaming or challenging their teenager in Mario Kart!"

Ruth Hadfield

References available upon request. Please email RANZCO.

High-tech Hands-on Training Using VR Simulators: Evidence Update

Dr Rahul Chakrabarti shares his expertise and updates us on the evidence for this developing technology.

"There is clear evidence of benefits from studies of simulator training and outcomes include reduced phacoemulsification times, lower phaco energy and fewer intra-operative complications."

I am privileged to have been involved in the development and implementation of the new microsurgical skills program for ophthalmology registrars in Victoria since 2018. Along with Director of Training, Dr Jacqueline Beltz, a microsurgical wet and dry lab curriculum was developed that incorporates virtual reality cataract surgery simulation in addition to traditional animal and dry lab models for developing ophthalmic surgical skills.

The motor skill component of ophthalmic surgery involves hand-eye-foot coordination dexterity and three-dimensional spatial awareness. Traditional Halstedian approaches for teaching have shifted towards simulation as it offers a platform for safe, deliberate practice. Virtual reality (VR) for cataract surgery is not new, and the EyeSi® (VRmagic, Mannheim, Germany) simulators have been used in training programs extensively throughout UK, Canada and US over the past decade. There is clear evidence of benefits from studies of simulator training and outcomes include reduced phacoemulsification times, lower phaco energy and fewer intra-operative complications.

A 2020 study by John Ferris' Group of ophthalmology trainees in the United Kingdom published in the *British Journal of Ophthalmology,* showed significantly improved outcomes following exposure to VR simulation in cataract surgery. A total of 17,831 cataract operations were performed by 265 trainee surgeons, of whom some had access to an EyeSi simulator and others did not. The researchers reported a 50% reduction in capsulorrhexis complications and a 38% reduction in posterior capsular rupture rate when trainees had received EyeSi simulator training. Similar findings were reported in a US-based study of simulator training which also noted significantly shorter surgery times (by 6.7 minutes; $P = 0.0001$) in those trainees who used a simulator compared to those who did not. This has implications not only for the patient at hand, but also for the health economic benefits of managing the complication itself, and the costs associated with further surgery and follow-up appointments, etc.

There is a great deal of further evidence for the benefits of VR simulator training in the academic literature, including a number of recent systematic reviews. Lee *et al*.

(2020) included 53 studies of VR tools in a systematic review published in the journal *Eye*. The authors concluded that:

"Virtual reality simulators were the most widely evaluated and the Eyesi Surgical Simulator in particular. For cataract surgery, evidence to support all aspects of content validity has been reported. Critical data support the collateral effects of using the Eyesi with training being shown to result in improved operating room performance and lower complications."

The GenEye faculty, an initiative of the Eye and Ear Hospital, delivers a four-tiered course with basic and advanced modules and complication training. In Melbourne, we are privileged to have two EyeSi virtual reality cataract surgery simulators. The simulator itself combines software built into an interface with an operating microscope, foot-pedals, and a patient head. Trainees receive objective feedback from the training software machine and have to demonstrate both proficiency and consistency at each level before being allowed to progress to the next level. We are now into our third year of registrars who have completed the VR cataract simulation as part of their transition to live surgery.

Even experienced surgeons may benefit from using a VR simulation platform from time to time. This is a platform that I will occasionally go back to prior to live cataract surgery if there has been a gap of several weeks. For example, last year I completed a strabismus fellowship and naturally had limited opportunity for cataract surgery.

The benefits for me at a personal level are both in the actual motor skill aspect but also in the realism of surgical planning (for example, a case with a small pupil or white cataract) and adjusting fluidic parameters. These specific scenarios, as an example, can be simulated on the VR platform. It offers immense benefit for safe, deliberate practice, and objective feedback.

Ruth Hadfield (Interviewer)

References available upon request. Please email RANZCO.

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The View from (somewhere near) the Middle

Dr Rogan Fraser talks about his perspective on virtual reality training.

"Change is inevitable but neither good nor bad in and of itself."

In the beginning there was light. So much light. And too much magnification. No, now not enough magnification. And why is everything out of focus? Hang on, are you left-handed? Okay, start at the end. Or, start at the beginning and when you get to the end…stop. Actually, STOP NOW.

Change is inevitable but neither good nor bad in and of itself. George Bernard Shaw said: 'Progress is impossible without change.' He also said: 'There is no love sincerer than the love of food', which is less relevant to the topic at hand. One significant change to the way ophthalmology registrars are training has come with the implementation of virtual reality (VR) as a surgical training tool.

The RANZCO Victorian training network introduced a structured VR simulator training program for cataract surgery using the EyeSi® Surgical platform (VR Magic, Mannheim, Germany) as a compulsory module at the start of 2018. Since then it has been iterated and continues to be a core part of the first three months of training for first years and has also been integrated into the training curriculum of second and third year registrars.

It is worth noting that the Victorian program does not only rely on VR simulation, with wet and dry model eyes still being used. Broadly, the structure of the program has two parts. The sequential completion of tasks within the EyeSi platform is one. This is complemented by numerous small group tutorials from experienced surgeons, combined with various simulation activities. These tutorials covered some tasks that could be readily taught using the EyeSi platform, such as capsulorrhexis and hydrodissection, in addition to critical topics that are not part of the VR training, such as suturing, wound construction, selection of viscoelastic, trauma surgery and post-operative care. These latter skills are honed using wet and dry models.

Of the EyeSi itself, I hear you ask: Is it like a video game? Well to some extent, yes. Is it fun? Sometimes. Is it frustrating? Almost exclusively for a period there. Does it make you a better surgeon? It is now reasonably clear that trainees learning on this platform have a lower complication rate once they transition to live surgery (Ferris, 2020). In our network, a survey of trainees from the first two 'VR-trained' cohorts found that capsulorrhexis was viewed as one of the easier steps when starting cataract surgery. And while informal, the consensus opinion that I have gathered in conversation with supervising surgeons is that they feel these groups have started at an advantage.

But what do I actually think about the whole experience?

It does start out feeling like a video game and while this, to me, did not seem to prohibit the development of skills to begin with, I found that a

change of mindset somewhere along the way was needed to get the most out of the training. It seemed reasonable to treat it like a game when all I was doing was using my forceps to move small red triangles into a sphere. So, when I ruptured my first posterior capsule, it felt like I had 'lost a life' but could simply restart the game and carry on. Then I remembered my supervisor saying something like "I want you to take this seriously. Especially your mistakes. This is the time to make them, but they shouldn't be made in vain." This is the benefit of supervision and structure, and I think this was the stick. But the carrot was there too. Merit-based transition to live surgery.

Ultimately, the bar to pass was high. Firstly, there was regular assessment from supervisors, the director of training and self-assessment. Then, timely completion of five cataract cases with consecutive scores of at least 80% in total and for each of the five domains (capsulorrhexis, hydrodissection, sculpting and cracking, irrigation/aspiration, and insertion and rotation of a toric IOL). And here, the lens capsule had a proclivity for charging off towards the equator. The nucleus was as strong as an ox, and the zonules as weak as a kitten just born. To some, the training came easier than to others. But alas, not a one passed first go. Nor second, third or fourth. But we got better and we all passed in good time.

"...it is not without some idiosyncratic discrepancies, but even in those discrepancies it acts as a form of elaborative rehearsal, whereby concepts – in lieu of precise actions – are solidified in one's mind."

I believe that the EyeSi platform is immersive, receptive and representative of real cataract surgery. To be sure, it is not without some idiosyncratic discrepancies,

but even in those discrepancies it acts as a form of elaborative rehearsal, whereby concepts – in lieu of precise actions – are solidified in one's mind. The perception of depth, heft and size are readily appreciable. The patient's eye moves and the red reflex with it as our (initially) heavy hands pushed and pulled. A millimetre's real estate becomes invaluable as you learn the virtue of steering well clear of the corneal endothelium. The training program encourages a steady hand but also purposeful actions. And punishes the contrary.

I had experienced poor outcomes on many (simulated) eyes before I had even been handed my first keratome by a scrub nurse. This is significant, or at least it was for me. I had a feeling for the mechanics of getting it right and some of those mechanics of getting it wrong. This training program and the experience I gained through performing virtual cataract surgery, gave me the confidence I do not think I would have had otherwise. Our patients deserve that. Virtual reality training is something that I would hope and recommend for all trainees.

Drs Rogan Fraser, Nick Enright and Tiffany Lo
FRANZCO, VIC

From Novice to Expert: The Story of a Zoomed-out Ophthalmologist

Prof Stephanie Watson talks about how COVID-19 sped up the evolution of her Zoom skills.

I have been an on and off Zoom user for the last few years – a so-called 'novice'. Last year, I chaired an ORIA board meeting via Zoom with over 10 people. I felt like my Zoom skills had already dramatically increased, as I was then able to turn my screen into what looked like The Brady Bunch theme song – clearly the producers had travelled into the future and seen a Zoom meeting. At that stage I had not envisaged that Zoom would become an increasing part of my everyday life; that I was on my way to becoming an 'expert'. I guess it was a bit like The Brady Bunch – you end up getting drawn to something that you do not necessarily want to end up spending time on and find that you cannot stop. I started with The Brady Bunch TV series but have now moved on to 'The Brady Brides', 'A Very Brady Christmas' and 'Getting Davy Jones' – the 37th Greatest Episode of all time according to *TV Guide's* Top 100. Now with Zoom, my use was increasing and I was gaining new skills!

Over the past two months, I have supervised my research group via Zoom, recruited two excellent candidates for our Corneal Fellow positions at the Sydney Eye Hospital, been part of a staff meeting at the Save Sight Institute, contributed to a RANZCO committee meeting, hired an employee, attended a conference and also had regular social catch ups. During this process, I have learnt the basics: how to schedule a meeting and mute/unmute (important when you are working from home with home schooling). I have also upped my skills by now knowing how to choose an appropriate virtual background (handy for when you have not tidied the bookshelf behind you), posting 'reactions' and touching up my appearance.

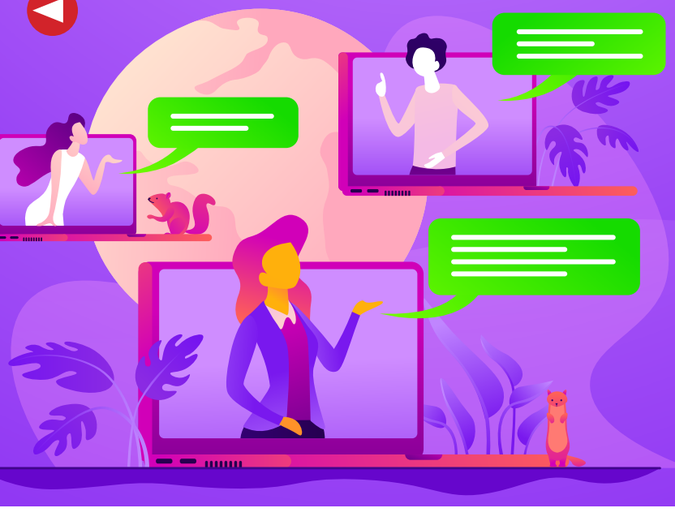
I have also found Tom Ford's 'Guide to Looking Hot on Zoom' where Tom suggests that you put your computer on a stack of books so the camera is slightly higher than your head – at about the top of your head, and then point it down to your eyes. He then suggests you take a tall lamp and set it next to the computer on the side of your face that you feel is the best to provide some 'flattering light'. Then put a piece of white cloth on your table, out of view of the camera, to give you 'fill and bounce'. But if you try to reach this level of Zoom expertise, you will end up looking tilted due to your uneven book pile, with a sore neck from looking down, and a headache from the glare of the light and the white paper!

Until the day we meet again in person, I know with much more than a hunch, that our College will still form a great bunch on Zoom and that's the way we will move vision care forward.

Prof Stephanie Watson
FRANZCO, NSW

"At that stage I had not envisaged that Zoom would become an increasing part of my everyday life."

Artwork by Jen Miguel



The Wonderful World of Virtual Meetings

If combatting "Zoom fatigue" is now on your list of skills to master, it means you have suffered the fate of many others. You join a meeting and after a few minutes, you decide you can absolutely do two things at once. After all, you spend most of your professional and personal life multitasking, so why is this any different? You check your emails, read the meeting notes, notice the shelf behind the monitor is askew… or if you've joined through your mobile, take a wander around the house to find that cup of tea you made 30 minutes ago and never touched.

1 The mute button

You forget to turn it off and everyone else in the meeting suddenly becomes overly familiar with the chaos that surrounds you or is noticing how you are clearly typing away on the computer.

You forget it's on and are chatting away to no one. The host is madly screaming "Your mute button is on!" while everyone else frantically waves their hands. Once you finally switch it on, your embarrassment forces you to cut short the point you were making.

There's no easy fix for this aside from consciously muting yourself as soon as you've said hi to everyone. If you want to make a comment, raise your actual (or virtual) hand first and then be ready to unmute when the host calls on you.

2 Angles

Sorry but your computer or mobile phone's camera is not your friend. Before the meeting, you only had one chin. Now that you've joined the call, you somehow have seven of them. Everyone can see, in great detail, how often you shave, pluck, manicure and otherwise care for your skin and hair. They can also see your house or office, and all the stuff you have, or don't have.

To fix this, just google "bad Zoom angles" and you'll feel better knowing how many other people get it wrong!

The experts seem to agree on three things:

- Lighting – softly does it.
- Camera angle – have the camera at a height that it can be angled just slightly down at you. Think about the camera as being right at your hairline and have it pointed down at your eyes.
- Let Zoom fix it – Zoom actually has a feature built in specifically for the purpose of making you look better. In the Zoom desktop app, there's a "touch up my appearance" option located in the camera settings.

3 Sorry, I missed that

Staying focussed is hard, especially when you're not face-to-face with people. That comes with a level of accountability to stay in the room.

On a video call, the only way to show we're paying attention is to look at the camera. But, in real life, how often do you stand within three feet of a colleague and stare at their face? Probably never.

The best ways to stay present are:

- Close any tabs or programs that might distract you.
- Hide yourself from view (in Zoom, right click your video to display the menu, then choose 'Hide Myself').
- Find a softly lit space that you're comfortable in and that's relatively free of distractions.
- Prepare for the meeting the same way you always would: come armed with a drink, etc. and arrive on time.
- Determine why you're on the call, either to contribute something or to gain something. Setting the goal at the start of the meeting will at least ensure you keep enough focus to achieve your goals.

4 Yadda, yadda, yadd…

If you find you're hosting a lot of virtual meetings, you need to find a way to keep your participants engaged.

Fix this by getting out of your comfort zone:

- In a virtual meeting, looking into the camera is the equivalent of looking into someone's eyes. It may feel unnatural but it means you're directly addressing the participants.
- Participants can't read your lips and facial expressions with the same clarity as a face-to-face meeting so it's important to speak clearly and a little louder than you're probably comfortable with.
- Be mindful of how long and how often you speak, which can be hard if everyone else is on mute.
- Check around the room for waving hands, in the same way you would for a face-to-face meeting. If you have multiple hands waving, set out the order in which each person will speak, reminding them to unmute first!
- Utilise the chat window. You can post the agenda or links, note topics that need to be addressed offline, etc. Do this sparingly though – you're not as good at multitasking as you think you are.

You know all of these and you still zone out? Apologise and hope the minutes are accurate!

The Use of Smart Phones in Ophthalmology

In this article, we discuss the uses and benefits smart phones offer to different fields in ophthalmology as well as its limitations.

D-EYE Smartphone (left) and iExaminer (right) – Photos retrieved from the official company website.

With improved data storage capability and faster processors, the use of smartphones and applications are increasingly becoming more popular amongst physicians. The number of users is rapidly increasing, with more than one billion users across the globe. A variety of devices are currently available for smartphone ophthalmoscopy, two of which are FDA-approved, namely the D-EYE and the iExaminer (Bifolck, Fink, Pedersen & Gregory, 2018). While the D-EYE attaches directly to a smartphone, the iExaminer is an attachment for the Welch Allyn PanOptic ophthalmoscope (Bifolck *et al*., 2018).

Smartphones in Diabetic Retinopathy (DR)

The monitoring and diagnosis of DR are challenging in resource poor areas due to the lack of trained personnel and the prohibitive cost of imaging equipment. Thus, the ubiquitous diffusion of the smartphones, in addition to their portability and recording capabilities, allows for this technology to be utilised in DR screening, especially in remote locations with limited access to clinical facilities. Several studies have been performed to screen for DR using smartphones. In 2015, a study was performed on 120 patients with diabetes mellitus (DM) to assess the reliability and accuracy of smartphone ophthalmoscope (Andrea Russo, Morescalchi, Costagliola, Delcassi, & Semeraro, 2015). After dilation, the participants underwent smartphone ophthalmoscopy with the D-Eye device, followed by a fundus examination at the slit lamp to grade DR. Both techniques resulted in the same grading in 85% of subjects, showing good agreement in the grading of DR between slit-lamp biomicroscopy and smartphone ophthalmoscopy. Numerous other studies have been published since, all with >90% sensitivity, and around 80-90% specificity (Kim *et al*., 2018; Rajalakshmi, Subashini, Anjana & Mohan, 2018; Ting *et al.*, 2017). Overall, smartphone ophthalmoscopes are useful tools in the grading of DR. In addition to this, implementing an AI-based grading algorithm alongside validated smartphone-based fundus images could be an effective alternative to direct ophthalmoscopy for identifying DR in the future. Not only does it offer a high sensitivity and specificity for detection of DR, it is more easily

accessed, and the increased portability allows a mobility that the traditional fundus examination with a slit-lamp biomicroscope fails to provide.

Smartphones in Optic Nerve/Glaucoma

Although most glaucoma types progress slowly, scientists suspect that more than 50% of patients are unaware of the diagnosis until it reaches advanced stages due to the disease being generally asymptomatic early on. A growing body of literature has demonstrated the potential use of smartphone-based fundus photography (SBFP) in improving case detection and minimising glaucoma-related blinding in the long run. A study was performed in 2016 which compared the accuracy of vertical cup-to-disc ratio (VCDR) obtained with undilated fundus biomicroscopy (90D fundus lens), with SBFP (D-Eye) in 110 patients. In brief, it was found that clinical grading of VCDR between the slit-lamp biomicroscopy and smartphone ophthalmoscopy techniques showed a substantial agreement, achieving a high specificity value of 99% (CI 0.94-1) grading VCDR of 0.9 (Russo *et al*., 2016). More recently, the impact of pupil dilation on image quality in VCDR with SBFP was further evaluated by Wintergerst *et al*. (2018). In this study, 54 eyes (27 patients) with glaucoma or suspected to have glaucoma, were imaged with both conventional fundus photography (CFP) and SBFP (D-Eye adapter) monoscopically. The findings of this study were that the mean VCDR on CFP and on SBFP was 0.76 (SD ± 0.14) and 0.73 (SD ± 0.13), respectively (Wintergerst, Brinkmann, Holz, & Finger, 2018). These findings further support existing data showing that glaucoma screening using SBFP is promising.

Use of Smartphones in Hypertensive Retinopathy

Despite the widespread availability of direct ophthalmoscopes, several limitations of the direct ophthalmoscope have restricted its use in the emergency department (ED) to identify ocular changes in an acute hypertensive patient. These limitations include a long period of learning and no image storage capability. In 2017, a prospective study was conducted to evaluate the feasibility of the ocular fundus photography with a D-EYE digital ophthalmoscope in an ED setting to better capture the diagnosis of hypertensive retinopathy, and to also compare it with a traditional ocular fundus examination. Fifty-two consecutive patients who presented to a hospital with an acute hypertension (i.e. systolic blood pressure > 180 mmHg and/or diastolic blood pressure > 100 mmHg) underwent a mydriatic funduscopic examination by a trained medical student using both a conventional direct ophthalmoscope and D-EYE digital ophthalmoscope. Of these, no relevant abnormalities of the funduscopic examination were detected by traditional ophthalmoscopy. However, abnormal examination findings were detected using the D-EYE digital ophthalmoscope in 17 and 19 patients by the medical student and ophthalmologist, respectively (Muiesan *et al.*, 2017). It is well known that direct ophthalmoscopy is a difficult skill with the majority of clinicians struggling to use the device. This was evidenced in this study with none of the trained medical students able to identify pathology using the direct ophthalmoscope. However, by using the smartphone adapter, they were able to identify the majority of cases with pathology, clearly demonstrating its ease of use. Replacing or supplementing direct ophthalmoscopes with smartphone adapters such as this may allow non-ophthalmologists in the emergency department to rapidly identify urgent ocular pathology to help facilitate early treatment and more accurate triage.

"Smartphones are a useful addition to the ophthalmic examination. Their portability, accessibility and low cost make them an excellent accessory to ophthalmic diagnostic tools."

Limitations

Although the use of smartphones can potentially replace more conventional, expensive devices in the future, several limitations of the smartphone imaging must be considered. Firstly, many smartphone devices and applications do not have an adequate evidence base and lack regulatory oversight by clinical or governing bodies. As previously mentioned, there are currently only two devices that are FDA-approved for smartphone ophthalmoscopy: the D-EYE and the iExaminer, both of which are only available on the iPhone iOS platform (Bifolck *et al*., 2018). A possible obstacle in the inclusion of more than one mobile platform is the variation of form factor between smartphones, meaning that devices for a specific model of phone or platform may not fit another. Therefore, addressing this issue would be a vital component in increasing screening and enhancing the safety of patients. Also, the existing concerns regarding limited high-quality research in smartphone ophthalmoscopy should guide the planning of studies that address methodological deficiencies in previous studies. This will ultimately enable smartphone technology to be accepted as an important adjunct to the delivery of healthcare globally in future.

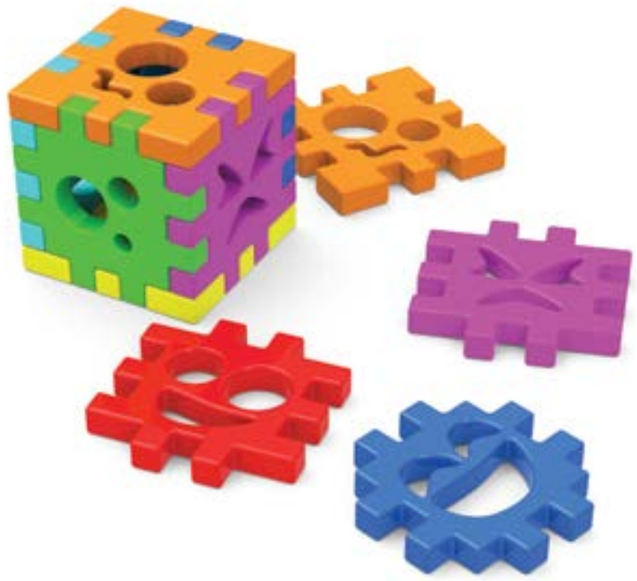
Smartphones are a useful addition to the ophthalmic examination. Currently, there is a significant amount of evidence that supports their use in diabetes, hypertension, glaucoma and as a teaching tool. Their portability, accessibility and low cost make them an excellent accessory to ophthalmic diagnostic tools. Although a variety of challenges remain in their wider spread adoption, with the steady publishing of literature citing the positive impacts that is seen with their use, they are likely to gain popularity in remote locations with poor access to healthcare.

Paul Youn, Dr Steve Bartnik and Dr Chandrashan Perera

References available upon request. Please email RANZCO.

Rocking the Boat

Dr Eugene Michael discusses the importance of 'speaking out' in helping RANZCO trainees navigate through a sea of emotions.



"Trainees will need support and guidance on when to 'rock the boat' in stormy waters and how to achieve 'smooth sailing' during times of relative calmness."

For many doctors, one of the proudest moments in their academic career is graduation from medical school. It is the culmination of years of discipline, hard work and enduring some of the many challenges encountered in our hospitals. As they set sail, undergraduates are exposed to clinical medicine, absorbing the workplace culture, understanding complex practices in a hierarchical system and engaging with an array of personalities. Yet for some, not all experiences in the workforce are smooth sailing. Humiliation, belittlement and verbal abuse are extensively reported in medical undergraduate surveys as a source of training dissatisfaction (Wilkinson). As a result, universities, medical training institutions and training boards have implemented specific strategies on bullying, harassment and discrimination. While these policies are well-intended, a criticism of a 'report per incidence' strategy is that it focusses on punitive or accusatory measures as opposed to addressing what is quintessentially a systemic issue. The policies neglect the fact that certain individuals in positions of seniority, would otherwise, under normal circumstances, behave quite differently if it weren't for challenges they must also manage on a daily basis.

The medical system is inherently hierarchical. While hierarchies optimise outcomes for efficiency, leadership and the management of a complex system, they also yield downsides which may be deleterious to individuals and pose a detriment to the system itself. At their worse, they have the potential to foment unmitigated bullying and sexual harassment, at the expense of those in lower positions of power. (The National Academies of Science, Engineering and Medicine).

In medical education, the practice of 'pimping' is viewed as a rite of passage. A trainee is asked a series of questions scrutinizing their medical knowledge, in front of patients and their peers, often in an interrogative and unrelenting manner. The social cues of a trainee's discomfort are overlooked in the pursuit of educational ideology. While some thrive in this type of learning environment, others become overwhelmed and feel as though they are drowning in a wave of emotions, questioning their self-worth and intellectual competency. The 'Socratic Dialogue' method of education and its differentiation from 'pimping' is a grey area and those with previous bad experiences, re-live each encounter like they're once again 'walking the plank'. 'Pimping' continues to be a popular method of education, despite a lack of evidence to suggest it is of superior benefit in training performance (Scott).

As doctors navigate through their training, there is pressure to gain rapport from senior doctors and a reluctance to challenge a perceived authority figure, due to the reliance on them for career advancement (Crowe). This creates a vulnerability for those, particularly not on training programs, who will often go to considerable measures to appease

their senior colleagues, such as sacrificing personal time to attend outstanding clinical or research duties. This, in turn, makes them particularly susceptible to burn out, emotional fatigue and declining levels of empathy (Neumann). Those that swim with the ocean current and possess attributes of agreeability, deference or obsequiousness are more likely to be viewed favourably.

It is suggested that a tidal change in the cultural paradigm is required to empower those at a junior level to have the confidence to 'speak-up' when gross inequities occur. Where behavior directed towards another is unequivocally inappropriate, there are clear guidelines in dealing with these issues. The difficulty arises when micro-aggressions or passive aggression occur and how to identify or raise this. There are also situations in which a trainee may not appreciate their contribution to an undesirable interaction and understand the need for calmness and conciliation.

One proposal is that feedback is made bi-directional and to promote open dialogue without fear of reproach. Moreover, if a trainee is perceived as questioning a senior's behaviour towards them or their clinical decision-making, this can be achieved without being constructed as mutinous (Srivastava). Enabling those at a junior level to freely express their concerns and contribute to patient care can foster an inclusive and supportive environment, with benefits to the wider workplace (Plan-Smith).

As we set forth for the horizon, it is incumbent on all of us medical educators to improve the status quo. For example, practicing self-reflection of our teaching style and how we interact with juniors, colleagues and other staff. Asking trainees how they feel about 'pimping' can allow them to voice whether they find it a useful or negative learning experience. The underlying cause of workplace harassment and bullying are systemic issues and subsequent systemic-approached initiatives are imperative in addressing this. It is worth asking your workplace or department how to access these resources. Similarly, dialogue should be actioned between senior staff and others within the workplace that specifically discuss these issues on a regular basis. This form of awareness-raising is in itself an incredibly powerful catalyst for change.

Ultimately, any progress should not fundamentally undermine the incredible amount of goodwill, mentorship and time invested by senior medical educators, which for the majority is conducive to a healthy and cooperative learning environment. Trainees will need support and guidance on when to 'rock the boat' in stormy waters and how to achieve 'smooth sailing' during times of relative calmness.

**Trainees refers to both undergraduate and postgraduate level, with those in formal training programs and in preparative training roles*

Dr Eugene Michael
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With acknowledgement to Dr Nicholas Toalster for his contribution to the article.

References available upon request. Please email RANZCO.

Steps you could take if you are having an interpersonal issue with a colleague at work

Based on the Decision Tree diagrammed by the Royal Australasian College of Physicians (RACP), here are some steps you could take if you are having an interpersonal issue at work with a colleague:

- Define the problem – Is it violence, sexual harassment, bullying, discriminations, impacting on patient safety?
- If it is, review your workplace policies and consider reporting the behavior.
- Get advice.
- Internal advice: Consider seeking advice through a trusted senior colleague, mentor, HR department or medical administration.
- External advice: Consider seeking independent advice (i.e. industrial organisation, legal representative, independent organisation).

If the problem is not any of the highlighted:

- Assess the problem's impact – Is the problem having a significant impact on your learning or wellbeing?
- Evaluate the severity of the problem – Do you think the problem is of a serious nature?
- If it is, review your workplace policies and consider reporting the behavior.
- Get advice.
- Internal advice: Consider seeking advice through a trusted senior colleague, mentor, HR department or medical administration.
- External advice: Consider seeking independent advice (i.e. industrial organisation, legal representative, independent organisation).

If you are unsure on the nature of the problem, think it through:

- How bad is it?
- How often does it happen?
- How does it affect you personally?
- How does it affect your performance?
- How many people have been affected?

A more detailed look at the RACP Decision Tree can be found here:

Is Your Practice Protected from Cyberattack?

Drs Marc Sarossy and Jason Ha discusses the importance of building cyber-resilience.

All of us know someone or some company that has been the victim of a cyberattack. Toll, which delivers many of our surgical supplies such as IOLs, has been targeted twice, and even large institutions are not immune.

Ransomware is one particular insidious cyberattack where your computer systems may be infiltrated and important files are encrypted in a way that renders them unusable. A large ransom must be paid via cryptocurrency in order to decrypt the files and use your systems again, with no guarantee that this will be successful. Exfiltration of confidential documents is also possible and can constitute a risk to you or your patients.

Cyberattacks are increasingly aimed at businesses and enterprises. Ophthalmology is at particularly significant risk of these cyberattacks and your own practice may be more vulnerable than you might think. Electronic medical records software, imaging databases, email systems and shared files – all frequently used in ophthalmology practices – are all at risk of cyberattack. Many attacks are now targeted attacks (spearphishing) with the attackers having previously done research on the target. Many practices publish "About Us" information and this can be cross referenced to other publicly available information to craft a plausible but malicious email.

How significant are cyberattacks?

We performed a study of the unwanted traffic encountered by the firewall of a suburban eye clinic over a 24-hour period. 15,126 intrusion attempts were logged, 53% of which originated from the Russian Federation (perhaps unsurprisingly!).

Well known ports and vulnerabilities were targeted: Telnet (1,818 attempts), SSH (349), remote access RDP (162) and VPN systems (SoftEther 124 and PPTP 40). Forty-four per cent of all attempted intrusions probed all four IP addresses in the range.

Are my backups able to stop ransomware?

The malware can get onto the system in a myriad of seemingly innocuous ways, including USB drives, emails, file attachments including PDF and office documents or via insecure remote access protocols.

One of the reasons ransomware is so successful is that it targets well-known backup protocols, including batch files that write copies of data to network share or portable drive locations. The malware encrypts or destroys those backup files too.

Current ophthalmological electronic records and imaging software are inadequate to deal with increasingly clever ransomware and much of the data are not encrypted, which imposes onerous reporting requirements on the practice in the event of an attack.

If your practice becomes the victim of a cyberattack, its effects can be devastating. Patient records and frequently used systems can be rendered unusable, all resulting in significant downtime, costs in data recovery and unnecessary stress for you.

What can you do to improve your cyber-resilience?

For now, the best way to improve your cyber-resilience is to work with your IT provider to review cybersecurity standards with respect to resistance to cyberattack, encryption of key data and the disaster recovery plan. Ultimately what is required is greater collaboration between practices, professional organisations and hardware vendors to ensure products are designed with adequate security.

For more information about guidelines and our research, please visit http://cybersecurity.sarossy.com.

Dr Marc Sarossy, FRANZCO VIC
and Dr Jason Ha

CHECKLIST

- ☑ 3-2-1 backup rule: Keep at least three backups of your data on at least two different storage media, with one of them located offsite.
- ☑ Secure your email – minimise your risk of phishing or spoofing.
- ☑ Ensure your software is up-to-date and important security patches are applied.
- ☑ Consider the use of third-party mail filtering services.
- ☑ Consider the use of virtualisation where possible.
- ☑ Segment your network on a different subnet and domain, and write backups there. Consider having servers on the segmented network too, if feasible.
- ☑ Secure remote access with VPN – don't rely on RDP security.
- ☑ Use multi-factor authentication.
- ☑ Invest in a good next generation firewall that has been professionally configured.

The Journey Towards AI-assisted Telehealth for Diabetic Retinopathy Screening in New Zealand

We spoke to Dr David Squirrell, an ophthalmologist and researcher based in Auckland, New Zealand and co-founder of Toku Eyes, about his team's journey towards an AI-assisted diabetic retinopathy screening.

By 2040, it is estimated that 224 million people worldwide will have some form of diabetic retinopathy. Diabetes is the leading cause of blindness in adults of working age.

In New Zealand, although there has been a diabetic eye screening program for the past 12 years, around 40% of diabetic patients are still not being screened for diabetic retinopathy.

"This means that patients with diabetes are losing sight unnecessarily which has both a human and societal cost," explained Dr David Squirrell.

How can AI improve diabetic retinopathy screening?

"There are two main factors that lead to the lack of completeness of screening: human factors – it is difficult to train or get trained personnel to read the images, and geographic factors – it is difficult for those patients located in rural areas to access screening," said David.

Although New Zealand is a small country, it is divided up into 20 different health board areas resulting in an inevitable lack of consistency and standardisation. As in many countries, there is a divide between urban and rural populations in New Zealand, with many rural people facing more difficult access to healthcare services.

The traditional diabetic screening process is lengthy with multiple steps. In New Zealand, four images are required per screening episode and the time from screening to reporting back to the patient can take up to six weeks.

Seeing a need to improve both the efficiency and the coverage of screening, the team at Toku Eyes set out to improve productivity and find an automated and scalable solution.

"We identified a need to develop a bespoke system for New Zealand so we commenced our journey to develop THEIA – our aim was to develop an accurate diabetic retinopathy AI. Essential criteria were that it must conduct autonomous image quality assessment. It must be able to accept images from multiple camera systems and data from multiple different graders," said David.

"Our vision was to create a unified, automated, scalable system that would allow our diabetic eye screening programs to work smarter and faster, to deliver results very quickly and at the same time protecting our eye clinics from being overwhelmed with multiple false positives.

"We wanted to read all the normal images quickly so we could focus our resources on the small number of patients with significant disease," he said.

THEIA – mobile diabetic retinopathy screening AI

In stark contrast to the weeks taken by the traditional screening program, the newly developed THEIA system identifies the 6% of patients who need to be referred for further investigation within seconds. The AI system helps by providing rapid triage of 'normal' images and increasing the productivity and cost-effectiveness of the clinician reading the referred images.

"We had an old system which was taking six weeks to find that 5-6% of patients who needed to be sent in and now we have a system which finds that 6% in 10 seconds," said David.

"Essentially by integrating an AI system within our diabetic eye screening programs, we've enabled them to work smarter and harder. The vast majority of patients with diabetes who we screen have no or minimal disease so we spend a lot of time looking at normal images. Only a very small percentage of images actually have significant disease which needs eye clinic review."

"The AI transforms the fundus camera into a smart diagnostic platform and it can use any existing camera system," said David.

"Essentially by integrating an AI system within our diabetic eye screening programs, we've enabled them to work smarter and harder."

THEIA performed well with high accuracy (98%), sensitivity (95.53%), specificity (82.02%) and negative predictive value (99.8%).

"The negative predictive value was very important because we needed to know that if the machine said the image was non-referable, then we could be very confident that this patient did not have disease which was going to be missed," said David.

The system is also suitable for deployment into rural areas as it lets the operator know when a suitable image has been obtained, so no high level expertise is required.

THEIA was given a training data set of 165,000 images that were representative of people with diabetes in New Zealand (Figure 1). Good quality images were processed and AI attention maps show where associations are being made (Figure 1).

"We introduced a traffic light system with red, the highest level, indicating that referral is required, amber may need referral and green does not need referral," said David.

David noted that many stakeholders were consulted throughout the process. He also highlighted the ethical concerns with approval from national and local bodies required to proceed.

The team have been very successful in obtaining funding for their research from a broad range of sources, having received in 2019 a Graeme Mack Award Diabetic Retinopathy from Diabetes New Zealand and a Science for Technological Innovation – National Science Challenges grant, and in 2018, an award from the NZ Ministry of Business, Innovation & Employment (MBIE) Endeavour Smart Ideas Fund.

What elements make a good healthcare AI?

Grouped within the term AI, there are different types of learning (Figure 2). In machine learning, the features of an image that you want the machine or computer to identify must be carefully defined. In comparison, in deep learning (which is a subset of machine learning), the machine itself learns what features are within an image that defines it using artificial neural networks. Numerous labelled images are required to train the machine and AI is only as good as the data it is trained on. Important factors include the size of the dataset, whether it is trained on the types of patients it will be used on and generalisable, and whether the data is biased in any way (e.g. race, age, gender, smoking status, etc.) (see box on next page).

"For those of us who are clinicians that are not so familiar with AI, I would encourage you just to continue to look at it like you would any other medical data. What's the original data set? Is the data set sufficiently big that I can generalise to my patients? Is it trained on the patients you intend to use it on? Does the data set have an inherent bias? Does it add value? Is it ethical and is the data secure?" explained David.

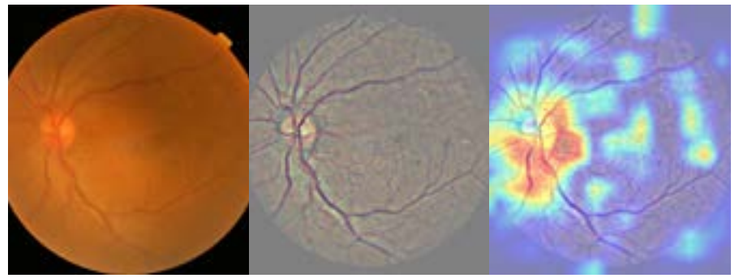
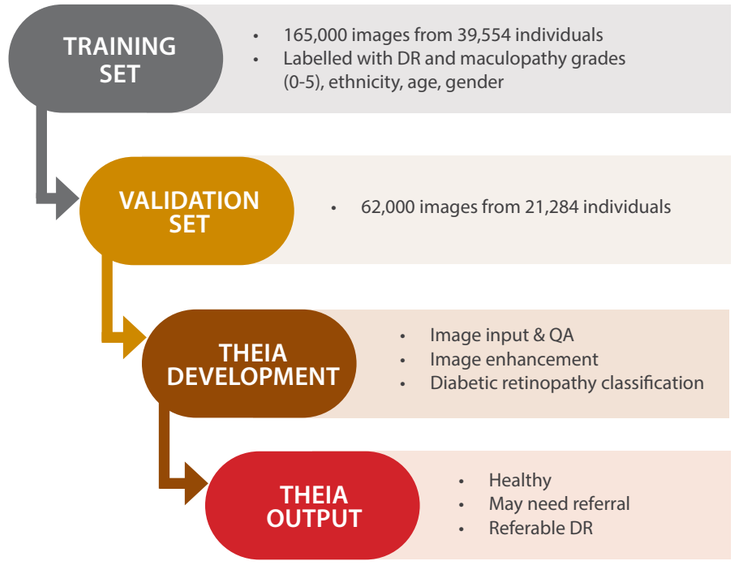


Figure 1: A good quality image (left) is normalised with Gaussian filters (centre) and then passed through the AI (right). The AI attention map shows areas where associations are being made – in this case, new vessels at the disc and some at the periphery (Image courtesy of Dr David Squirrell, Toku Eyes).



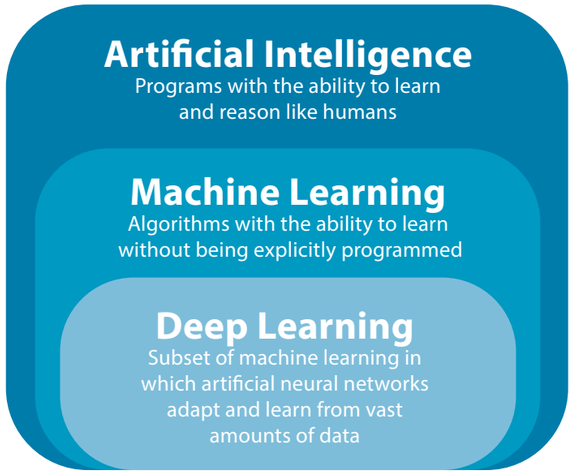
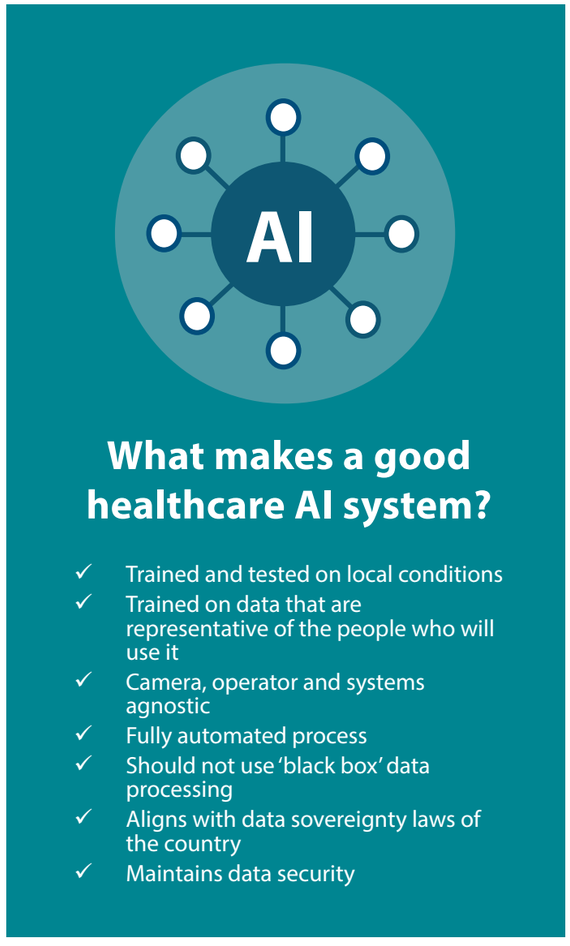


Figure 2: Different types of learning



When asked whether there were any misconceptions about AI, David emphasised that AI won't replace ophthalmologists but will instead allow them to work faster and smarter.

"AI is starting to have quite a major impact on ophthalmology – in many ways it is surprising it hasn't had more impact yet because of the power of AI," said David.

"I like to think of AI as a clinical assistant tool."

He echoed the sentiments of Noel Sharkey, Professor of Robotics & AI at Sheffield University, who said:

"Decisions about people should be made by people; AI should be considered a tool to assist human decision-making, not the replacement."

David also noted that this sentiment is voiced in a Māori proverb:

He aha te mea nui o te ao. He tāngata, he tāngata, he tāngata

What is the most important thing in the world? It is people, it is people, it is people.

Read more in the recent PloS One article by Dr Squirrell and his team:

Ruth Hadfield

References are available upon request. Please email RANZCO.

Special Interest Groups

ANZCS

The Australian and New Zealand Cornea Society (ANZCS) and the RANZCO Cornea Special Interest Group have merged. Membership is free and open to all ophthalmologists, eye bank scientists, ophthalmic researchers or others with an interest in cornea. If you would like to join, please contact nicktoalster@me.com.

The ANZCS committee has been finalized as below. I would like to thank A/Prof Richard Mills, Prof Geoff Crawford, Dr Andrew Apel, Prof Stephanie Watson, A/Prof Mark Daniell, Dr Andrea Ang, Prof Nigel Morlet, Dr Raymond Loh and Prof Gerard Sutton who have all recently stepped down from the committee.

ANZCS had a successful meeting combined with the Eye Bank Association of Australia and New Zealand in Auckland on 28-29 February. This was the last chance many of us had to travel prior to COVID-19 restrictions and the meeting was enjoyed by all. Prof Fung-Rong Hu virtually presented the Douglas Coster Medal Lecture on infectious keratitis as he was unable to attend due to travel restrictions. The in-person John Blandford Lecture by Prof Colin Green was about the journey from laboratory bench to bedside.

Currently, we are working on strategies to progress corneal transplantation and look after our patients during and after the pandemic. We look forward to progressing according to our recently identified values of excellence, innovation, collaboration and diversity over the next few years.

Dr Jacqueline Beltz
Chair, ANZCS

ANZCS
Australian & New Zealand Cornea Society

ANZCS Executive:

Chair
Jacqueline Beltz

Secretary/Treasurer/QLD
Peter Beckingsale

Young Fellow
Nick Toalster

Eye Bank Rep
Graeme Pollock

VIC
Elaine Chong

WA
Steve Wiffen

SA
Aanchal Gupta

NSW
John Males

NZ
Charles McGhee (Dipika Patel)

Ocular Oncology Update

Although the COVID-19 pandemic has presented significant interruptions and challenges, numerous opportunities relevant to ocular oncology have also emerged. For example:

- The necessary triaging and rationalisation of ocular oncology consultations have prompted a widespread review of clinic booking protocols. This may result in efficiency gains persisting well beyond the pandemic.
- Telehealth consultations – while suboptimal in many respects – are particularly valuable to many ocular oncology patients accustomed to travelling long distances for in-person consultations.
- In the context of widespread cancellation of conferences, on 25 April, the All India Ophthalmology Society (AIOS) convened the first international webinar on ocular oncology. A faculty of distinguished international speakers produced highly informative and timely presentations with relatively few hiccups!
- The increased reliance on technology, including electronic data storage and communication in patient care, clinical trials and continuing professional development, highlights the importance of systematic data collection. Ocular oncologists in Australia and New Zealand face significant challenges here, including dispersed populations, scarce resources and diverse administrative and funding structures. Data collection and clinical audit will be the principal focus and priority of the Ocular Oncology over the next couple of years.

Dr Daniel McKay
Chair, Ocular Oncology

RANZCO Affiliates

Australian Society of Ophthalmologists Update

Technology and Politics – Bedfellows for Eternity

As I tuned into my first Zoom teleconference, I was proudly waxing lyrical to my children about the miracles of technology. They were thoroughly unimpressed. To them it was not much of a miracle! That is the thing about new technology – it is only miraculous if you have a memory of the past.

Our current crop of registrars will not know of a time before anti-VEGF, OCT and microsensor-controlled phacoemulsification. Just as surgeons of my generation gave little grace to talented extracapsular cataract surgery, the modern generations will not be interested in my technical difficulties with early phaco technology. Does a modern fighter pilot really understand the talent of the original test pilots?

Post occlusion surge and chamber instability are historic references the registrars will never know – which is a good thing of course! However, it does leave my feelings hurt that I had to battle through such difficulties with nobody giving me credit, except for my peer buddies at the RANZCO Congress. Every year at RANZCO, watch as old pals break off into private dinners and relive their glory days, "Geez we were great registrars weren't we?"

The thing about technology is that it is a cruel mistress which marches forward without room for hurt feelings. You adapt or become outdated. A newer thing comes along and you are obsolete overnight, which is why it is so important to keep investing in your technology base and pushing your personal comfort zone and skills to remain current.

In 20 years' time, today's registrars will fully understand the cycle of life. Their registrars will be saying, "Can you believe my boss still uses an OCT? He doesn't even use an MGA (molecular genetic amplifier)." I do hope that they are also saying, "Just as well the ASO went into battle with the government to get a rebate for the Phaco Vaporiser. Otherwise, we'd be stuck with that old phacoemulsifier the bosses talk about."

The current COVID-19 medical emergency will pass, but I fear that the economic legacy of indebted governments will remain for the lifetime of the current reader. With excessive training of medical practitioners currently underway, it may not be a seller's market in 20 years. Governments and private insurers will look to reduce medical expertise to a cheapened commoditised product and technology companies will advance artificial intelligence to supreme levels. Will the art and science of medicine be lost to the economics of a minimally viable product at the cheapest labour cost?

The ASO exists to ensure that clinicians will always have a seat at the table of discussion. This means that we must know where and when the discussion is happening – which is of course the art of politics. We want ophthalmologists to have at their disposal the best technology of the day and an economic framework within which it is affordable to patients and ophthalmologists. Technology will change but the tensions between cost-cutting governments and frontier clinicians will never go away.

The ongoing role of ASO is to work with governments of today and those of tomorrow to maximise the input of ophthalmologists on the front lines. I would like to see more younger ophthalmologists join ASO. The platform we lay today will help you and your patients afford your MGA and Phaco Vaporiser in 20 years' time!

The ASO is Australia's peak medico-political ophthalmic body, fighting for the rights of patients in both public and private health sectors. Fellows who have graduated within the last two years are entitled to a 50% discount on membership. Trainees receive complimentary membership. For further information please visit https://asoeye.org.

Dr Peter Sumich
President, ASO

Australian Society of Ophthalmologists ASO

ANZEF Update

Getting Ready for JulEye

This JulEye, your Foundation is working hard to raise public awareness of simple prevention measures to common household eye injuries. With more and more people staying indoors and tackling DIY projects and complex recipes, eye injuries are on the rise. The Australian and New Zealand Eye Foundation (ANZEF) will be campaigning to increase the public's knowledge of simple prevention measures. ANZEF is also seeking to raise public awareness of ophthalmology – largely in the context of the role of the ophthalmologist when injuries do occur.

We will be working hard to get your stories into the mainstream media. If you have treated a patient who has suffered an eye injury in the home and think it might be the basis of a good story, get in touch via ranzco@ranzco.edu.

As always, your Foundation is working hard to increase public awareness of ophthalmology and to raise funds. The Foundation is a keen supporter of ophthalmic research, with a total of $178,020 raised and donated to ORIA. Capacity building in our region through educational grants have also enabled the Pacific Oculoplastics Fellowship in the Solomon Islands to proceed.

We look forward to working with you throughout 2020 and beyond. In the meantime, please keep looking out for the JulEye publicity and contact us with your feedback via ranzco@ranzco.edu.

John Kennedy
Chair, ANZEF

If you would like to financially support your Foundation, please make a tax-deductible donation via bank EFT as follows:

BSB: 062016
Account #: 11614360
Ref: ANZEF/ Your Name

Immediately email anzef@ranzco.edu afterwards so we can contact you with a receipt.

The Australian and New Zealand Eye Foundation wants all Australians and New Zealanders to focus on preventing avoidable eye injuries this JulEye.

Did you know about 30% of all eye injuries occur in the domestic setting? DIY, car repairs and gardening have been shown to be a common cause of eye injury especially amongst males. Nearly all of these eye injuries can be prevented by taking the simple precaution of wearing suitable eye protection.

Suitable eye protection is that which is:

- designed for the particular task at hand,
- correctly fits the wearer, and
- complies with the relevant AS/NZS standards for that activity.

Find out more

ANZEF is the charitable wing of The Royal Australian and New Zealand College of Ophthalmologists
ABN 80 000 644 404
94-98 Chalmers Street Surry Hills NSW 2010
Website: www.ranzco.edu **Email:** anzef@ranzco.edu

RANZCO | Australian and New Zealand Eye Foundation

CERA Update

How COVID-19 is Changing the Future of Eye Care

The rapid uptake of telehealth services to stop the spread of coronavirus is adding impetus to research to develop innovative new ways of diagnosing and monitoring patients with eye disease.

Professor Mingguang He

"Vision impairment and blindness are major public health problems in Australia, with up to 50 per cent of major eye diseases remaining undiagnosed"

As the COVID-19 pandemic has spurred Australia's health care practitioners to replace many routine face-to-face appointments with phone or video consultations, telehealth has moved into the mainstream.

CERA researchers are leading major projects to develop innovative new diagnostic tools that can be used in the home or outside of traditional eye clinic settings. They predict the shift to telehealth services will continue to gather pace after the COVID-19 pandemic has ended.

AI bridging the eye health gap

Prof Mingguang He is leading research trialling the use of an artificial intelligence tool to identify people at early risk of blinding eye diseases including diabetic retinopathy, glaucoma, age-related macular degeneration and cataract.

After taking a photo of the back of the patient's eye, the AI system scans for signs of disease and prints out a report identifying if the patient should be referred to a specialist for further assessment and treatment.

"Vision impairment and blindness are major public health problems in Australia, with up to 50 per cent of major eye diseases remaining undiagnosed," says Mingguang.

"Artificial intelligence has the potential to close the gap in eye care by enabling screening programs to be introduced in remote and regional areas that are currently missing out on eye care services."

The AI tool's algorithm has been developed over five years using more than 200,000 images of the back of the eye and has been found to be highly accurate.

It is now being trialled in real world setting, including remote Indigenous communities in the APY Lands in Central Australia in a collaboration with the Nganampa Health Council and The Fred Hollows Foundation.

The next step will be to compare the AI tool against current telehealth models and measure accuracy, cost effectiveness, ease of use, and patient and clinician acceptance.

"After COVID-19, face-to-face consultation will become increasingly challenging," says Mingguang.

"Artificial intelligence integrated with automation and robotic technology will enable us to develop a virtual clinic as a new model of care.

"We are working hard to not only make AI more accurate, but also faster, easier to use and less dependent on operators and physicians."

In a separate project, Mingguang, supported by the Google Impact Challenge, has led the development of an app which enables people to measure their visual acuity at home.

The app, which calibrates distance using face recognition technology, has an accuracy level similar to tests taken in clinical settings.

CENTRE FOR Eye Research Australia

MDFA Update

MDFA's Online Campaign Supporting IVI Patients During COVID-19

In any other year, Macular Disease Foundation Australia (MDFA) would avail of this edition of *Eye2Eye* to share Macula Month campaign activities. This annual campaign, with a goal of urging Australians in higher risk groups to book in for an eye examination, has been a staple of the eye health calendar over recent years.

The impact of COVID-19 meant that our planned Macula Month 2020 campaign had to be 'put on ice' for a later date–which involved innovative use of technology–and instead, Macula Month focused on very different messages.

In early April, ophthalmologists around Australia reported an increase in the number of cancellations for intravitreal injection appointments due to fear and confusion around Coronavirus regulations. In some clinics, up to one–third of patients were missing appointments, citing fears of breaching public health COVID-19 restrictions. This was despite RANZCO's government-endorsed COVID-19 Triage Guidelines categorising eye injections and laser as urgent and essential.

This issue prompted us to focus our Macula Month messaging on the importance of maintaining sight saving injections and laser treatments during COVID-19. MDFA made representations to the Federal, State and Territory Health Ministers to ask that government messaging emphasise the importance of urgent and essential treatment for chronic health conditions including eye health.

We also rolled out a national integrated media campaign featuring MDFA National Research Adviser, Prof Paul Mitchell and MDFA Medical Committee Chair, A/Prof Alex Hunyor who spoke on the importance of attending scheduled appointments during the pandemic. They reassured patients on additional sanitisation protocols set in place to minimise the risk of disease transmission.

A second wave of the media campaign featured long time MDFA Patron, Ita Buttrose AC OBE making a direct appeal to older, more vulnerable Australians through a community service announcement.

The messages, broadcast extensively by mainstream media, were supported by a complementary, multi-stream digital campaign. Ita is held in high regard by the macular disease community and the feedback was almost instantaneous, with a doubling in calls to the National Helpline days after the release of the community service announcement.

Her calm reassurance has gone a long way to address the concerns held by many wAMD and DMO patients. We are grateful to Ita for her continued support in awareness campaigns aimed at saving sight.

MDFA also implemented an ambitious phone support outreach program, with education officers using our extensive database to make hundreds of calls to 'check in' on at-risk members of the macular disease community. All of MDFA have been working remotely from home thanks to our recent investment in integrated technology.

"MDFA also implemented an ambitious phone support outreach program, with education officers using our extensive database to make hundreds of calls to 'check in' on at-risk members of the macular disease community"

Community webinar series

The community response to switch education seminars from traditional face-to-face forums to a webinar format has been very positive and has attracted strong registration numbers.

The webinars have allowed MDFA to focus on specific topics of interest to the macular disease community and people living with macular conditions such as nutrition for optimal eye health, safety in the home, low vision aids and technology, and mental wellness with low vision.

The webinar format allows MDFA to continue to reach out and provide education remotely to a wider audience across Australia. Importantly, the technology provides more opportunities for people living with or caring for someone with macular disease to access professional advice in an online environment from the comfort of their own home while in isolation.

Many of the seminars are co-hosted by experts such as retinal specialists, psychologists and nutritionists. This provides for a more interactive forum where participants can ask questions directly to subject matter experts. All webinars are recorded and available on the MDFA website for those unable to attend live.

The success of the webinar series will ensure the program will continue after COVID-19 regulations have been lifted.

If you are an eye health professional and would like to participate in a webinar or suggest a relevant topic, please contact MDFA's education team at education@mdfoundation.com.au.

If you would like to invite your patients to register for webinars, they can do so at www.mdfoundation.com.au/education-sessions. All MDFA services are free to the general public.

Dee Hopkins
CEO, Macular Disease Foundation Australia

Macular Disease Foundation AUSTRALIA

ORIA Update

Supporting the Future of Ophthalmology through Artificial Intelligence

ORIA support enabled Dr Stuart Keel, working with RANZCO Fellow Dr Angus Turner and Prof Mingguang He, to harness the power of AI for eye disease screening in primary care. The ORIA Research Impact Report published in 2019 highlighted research such as Stuart's.

Prof Stephanie Watson, Chair of the ORIA, commented that "Ophthalmic research is highly valued by patients, the profession, and the public. Research such as Dr Keel's has the potential to save sight by diagnosing conditions such as diabetic retinopathy while they can still be treated." Research also provides evidence so that better decisions can be made on how to treat patients, how to educate the profession, and to develop policy to influence stakeholders, such as the government, and inform the public. For example, ORIA's contribution to the MBS review.

There was an urgent need to fund this project, as up to 500,000 adults in Australia have vision impairment or blindness with around 80% of vision loss avoidable through early detection, prevention and treatment strategies. An estimated 50% of glaucoma and diabetic retinopathy cases in Australia go undiagnosed.

"Identification of eye diseases through a screening program is an important step towards the protection of visual function in the Australian population," explains Stuart. "Given that GPs are the cornerstone of primary care and 85% of the Australian population visit a GP service at least once every 12 months, they should have a central role to play in the opportunistic screening and identification of eye diseases."

For this ORIA funded project, an innovative screening system was developed to combine retinal photography with AI grading in a portable system. The aim of the technology was to facilitate detection of diabetic retinopathy, glaucoma, age-related macular degeneration and cataract, in an opportunistic primary care setting. A rural general practitioner is currently being trained to use the system.

"Delays in diagnosis of common eye diseases dramatically increase the burden of vision loss in the Australian community and health care system. Although retinal photography can increase early diagnosis, the need for expert manual interpretation of the photographs presents a barrier to its wider use. The development of an automated system of interpretation solves this problem, and its integration with an affordable and portable retinal camera offers great potential to increase the uptake of eye disease screening within GP settings," said Stuart.

Prof Stephanie Watson
Chair, ORIA

ORIA
ADVANCING EYE RESEARCH

KeepSight Update: 2020 Australian of the Year Dr James Muecke Lends Support to KeepSight

The KeepSight team recently caught up with Australian of the Year and Chairman of Sight for All, Dr James Muecke to discuss diabetes and eye health. James has devoted much of his career to fighting blindness around the world and is lending his support to KeepSight, Australia's diabetes eye check reminder program. The program is run by Diabetes Australia, in partnership with Vision 2020 Australia and is supported by the Australian Department of Health, Centre for Eye Research Australia (CERA) and Oculo, as well as Specsavers, Mylan, Novartis and Bayer. The eye care sector is being urged to register as KeepSight providers and then sign up their patients for regular reminders.

L-R: Ms Judith Abbot (CEO, Vision2020), Dr Kate Taylor (CEO, Oculo), Dr James Muecke, A/Prof Peter van Wijngaarden (Deputy Director, CERA) and Prof Greg Johnson (CEO, Diabetes Australia).

Ophthalmology New Zealand Update

COVID-19 has been said to be the most egalitarian challenge seen in the last 100 years as the challenges that are being faced do not discriminate by country of origin – it is on every continent in the planet. Of the 251 countries recognised by the World Health Organization (WHO), 212 are reporting COVID-19 infections (as of 12 May 2020). Each of these countries have their own environment, regulatory system and more importantly, health system. This is why Ophthalmology New Zealand (ONZ) went into action during March through to May, as New Zealand announced a unique Level 4 Alert System on 21 March. New Zealand quickly moved to full lockdown on 26 March, where all non-essential business closed and all New Zealanders (with the exception of essential services) were asked to stay in the "bubbles" of their own homes. Only urgent and emergency medical care was permitted, and all elective surgery was cancelled.

During this time, ONZ's work has been to assist our ophthalmologists with advice and resources on how to attend to their patients and workflow in these challenging times. An important function has also been to ensure that we created forums where ophthalmologists could work with the Ministry of Health and each other.

Resources that have been compiled and made available to our members on our website (www.ophathlmologynz.co.nz) include:

- A resource package, including links to the various NZ bodies for assistance in employment, subsidies, tax and health advice and policies.
- COVID-19 workplace policies, in patient flow and infection control.

In order to increase communication nationally, ONZ created a dedicated private Facebook group for ophthalmologists to exchange information and best practice resources.

In addition to the resources, on 21 April, ONZ convened a special COVID-19 Update Meeting in conjunction with the NZ Branch of RANZCO. This online meeting was attended by 87 ophthalmologist members, non-members and RANZCO executive and staff, in a discussion which centred around surgical options upon moving from Level 4 to Level 3 and beyond.

The outcome of this meeting was a coordinated agreement on surgery post Level 4, a greater understanding of DHB and private workflow requirements, and how providers could assist in the National Response. Further resources from this meeting include the **RANZCO Statement on Level Changes** and the **ONZ Guidelines on Elective Surgery post-Level 3** (available to members on the ONZ website: www.ophthalmologynz.co.nz).

A greater outcome from this meeting was the strength of our ophthalmologists, brought together by ONZ, to communicate across the nation, across the private and public spectrum, working together to ensure patients' urgent needs were met in the safest clinical settings possible in our new COVID-19 world.

The ONZ Board also took the time, while locked down in their homes, to attend to a Strategic Planning Session, which has clarified our vision, mission and goals.

Reference available upon request. Please email RANZCO.

ONZ
Ophthalmology New Zealand

Save Sight Institute Update

Optogenetics for Vision Restoration

"I've been told nothing can be done" is a phrase we commonly hear from our patients with inherited retinal degeneration (IRD). As ophthalmologists, we know that this isn't true. Many things can be "done" to assist people in living with conditions that are considered "untreatable". But what about active interventions for IRD? Luxturna (voretigene neparvovec) gene therapy has been approved by the US Federal Drugs Administration and the European Medicines Agency for patients with RPE65-associated retinal degeneration. The impressive results of the pivotal trials of this drug should not be downplayed, nor should the importance of IRD as the leading cause of blindness in people of working age. Nevertheless, luxturna gene therapy is suitable for perhaps only one in 300,000 people and more than 250-causative genes have been identified in association with IRD. This is further compounded by the fact that around 30% of patients presenting to specialised clinics never receive a firm genetic diagnosis.

Clearly, there is a need for causative gene-independent approaches for vision restoration in IRD. Optogenetics, which was originally developed in the early 2000s to study and control neural circuits in the brain, is just such an approach. In many respects, it represents a biological alternative to the electronic retinal prosthesis. Regardless of the genetic cause, the final common pathway to vision loss in IRD is the loss of cone and rod function. However, the second order (e.g. bipolar) and third order (i.e. retinal ganglion) cells persist. It is these cells that are targeted by optogenetics, which renders them light sensitive, thereby restoring vision. This is achieved through the introduction of light sensitive proteins or opsins.

At the Save Sight Institute, we have been studying the effects of a new opsin, bReaChES, on the retina. bReaChES is a modified channelrhodopsin – a class of light sensitive protein found in unicellular green algae which is particularly promising for vision restoration. First, bReaChES not only acts as a "light-detector", but it is also simultaneously capable of activating nerve cells without a series of complex reactions. Second, it similarly reattains its light sensitive state through a simple process of spontaneous relaxation. Third, it shows preferential sensitivity to long wavelength light, which is both less damaging to the retina and better transmitted by the optics of the eye, than short wavelength light. The treatment itself is delivered using a "conventional" gene therapy approach – the genetic sequence for bReaChES is incorporated into an adeno-associated viral (AAV) vector. The vector, in turn, delivers its genetic payload to retinal cells which results in stable and sustained protein production. Together with our colleagues in the Department of Physiology at the University of Sydney, we have demonstrated that AAV gene therapy leads to a significant production of bReaChES in retina (Figure 1). In turn, this expression results in novel light sensitivity of normally light insensitive retinal ganglion cells (Figure 2). Importantly, responses occur at light levels equivalent to bright indoor lighting and with receptive field sizes similar to those achieved through photoreceptor-mediated stimulation (Figure 3). As a consequence, this is anticipated to support adequate levels of visual acuity and light sensitivity without the need for stimulus enhancing goggles. At present, we are completing pre-clinical trials. The ultimate aim is to complete the requisite steps to conduct a Phase I trial of optogenetic gene therapy in Australia.

A/Prof Matthew Simunovic
Save Sight Institute

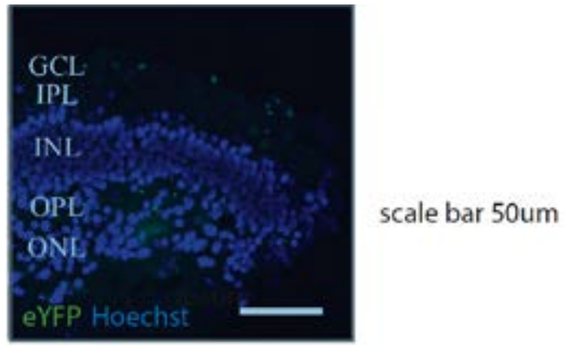


Figure 1: *Human surgical retinal explant in tissue culture exposed to an adeno-associated virus carrying the sequence for bReaChEs demonstrating co-localisation of Hoechst staining (blue) and bReaChEs expression in the retinal ganglion cell layer.*

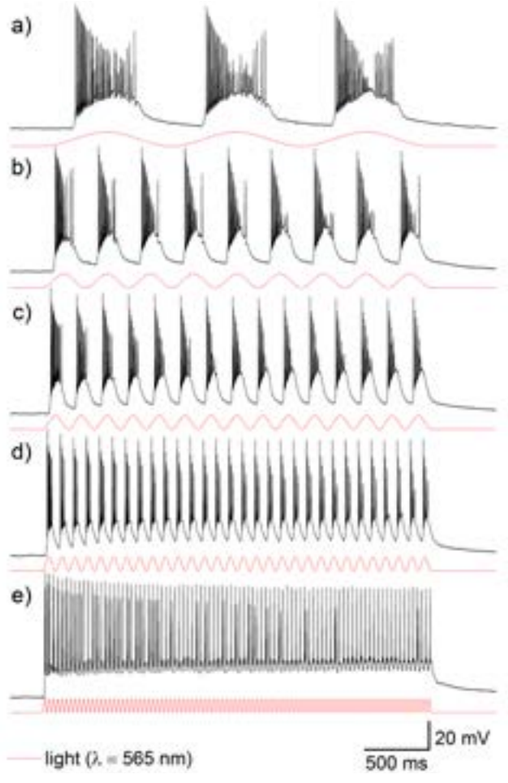


Figure 2: *Light-evoked responses from a retinal ganglion cell in a wholemount retina following intravitreal injection of AAV2-CaMKIIa-bReaChes-eYFP. Responses were evoked by flickering yellow light (565 nm) at (a) 1 Hz, b) 3 Hz, c) 5 Hz, d) 10 Hz and e) 30 Hz) following bleaching of the photoreceptor response.*

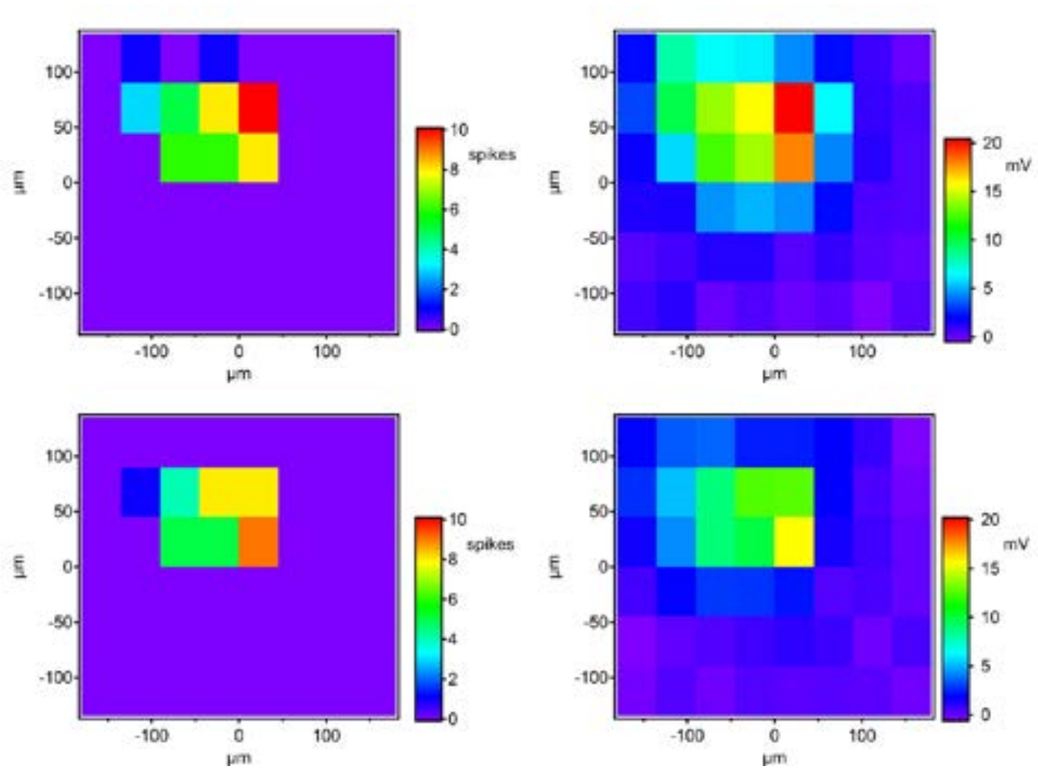


Figure 3: *Receptive field characteristics to light stimuli from patch-clamp recordings from two individual retinal ganglion cells expressing bReaChES. These demonstrate intrinsic light-sensitivity and responses over retinal areas ranging from 75-300 microns. The x-axis and y-axis represent distance in microns and the heat map represents the peak spike frequency (left column; spikes)*

Policy and Advocacy Matters

Change in the Midst of a Crisis

Dr Kris Rallah-Baker delves into the Aboriginal Health Sector's response to COVID-19 via the creative use of media and the dissemination of public health messages to remote and diverse communities and language. groups.

"The untapped reserves within our IT systems have performed seamlessly and demonstrated that if need is the mother of invention, then in this, crisis has been the mother of change."

We live in interesting, though not unpredicted, times. The COVID-19 crisis has challenged our systems and forced novel approaches to the business of doing business across the whole of society. In the context of patient care, we have been forced to re-think the structure of our traditional Western medical paradigms and the delivery of care. Telehealth item numbers for phone consultations have been opened across specialties and online virtual meetings have flourished. Social distancing has been enhanced and often enabled with the assistance of technology. The untapped reserves within our IT systems have performed seamlessly and demonstrated that if need is the mother of invention, then in this, crisis has been the mother of change.

In Australia, we are lucky – we have done well in controlling the virus and have successfully flattened our curve, to date. That effort has not been without trial and personal sacrifice, but in the absence of current technology, much of what has been achieved would simply not have been possible. We had the technology present and operational. Consequently, virtual meetings, consultations and interactions have placed us in a very different position than our forebears who endured the Spanish Flu.

Public messaging, particularly to remote and diverse communities and language groups, has been enabled with the widespread and rapid dissemination of official and unofficial messaging. Ranging from government apps to local onscreen guides, we have utilised information technology to rapidly spread the latest public health message. As the crisis has evolved and our knowledge of the virus improves, our infotech systems have informed the public on a real time basis of those updates. Infotech also allowed the rapid translation of the English language to cater for our language-diverse communities and adapted messaging to remain relevant and targeted to other diverse groups in society. The threat of false messaging and misinformation through social media has been confronted with nimble responses from medical experts and government advisory units utilising those same platforms in real time.

In ophthalmology, although critical care delivery, including the administration of intravitreal injections, has had to remain an in-person event, review appointments for stable conditions and some post-op reviews have been able to be undertaken via telephone consultation. In Western Australia, where the distances are vast, telehealth services have been utilised in ophthalmology for quite a period now and lessons can certainly be learnt from that experience in the current climate. It may be time that we re-consider our traditional emphasis on bringing our often elderly and infirmed patients in to see us in person when an alternative may be available, particularly in the case of routine review, building on our history of ophthalmology being a quick adopter of new and proven technologies. That is not to discount the inherent value of person-to-person consultations but simply to suggest that we reserve our resistance to new tools in the area of tele- and virtual health which may emerge to enhance our armoury available in the pursuit of best patient care.

Mainstream Australia has done very well in adopting and adapting to change in the health care system in response to COVID-19 and in no small means our Indigenous population has been even quicker in that adoption. The online MJA published on 29 April 2020 included an article titled "First Nations people leading the way in COVID-19 pandemic planning, response and management", which outlines the prior experience and drivers behind Australia's First Nations speed in responding to the onslaught of COVID-19. It is ironic that the world's oldest cultures have been most adept at adopting new technologies to communicate and interface with the health care system during this crisis. That adoption has been driven by past experience, including the more recent SARS, and an acute awareness of the significant morbidity and mortality incurred due to the worse social determinants and disease burden suffered by Aboriginal and Torres Strait Islander Peoples. Technology has been utilised to facilitate messaging with the production of parodies, crisis webcasts, information sessions supported by web-based conference, facilitated by the Australian Indigenous Doctors Association (AIDA) and related peak bodies, as well as the utilisation of numerous social media platforms. Our Indigenous rural and remote communities have remained free of COVID-19.

"Our Indigenous rural and remote communities have remained free of COVID-19."

We are indeed "The Lucky Country" and we all hope our current success in controlling COVID-19 will continue. If, however, as ophthalmologists we are required to return to restricted and urgent face-to-face care only, we will need to remember where technology can assist us and work collaboratively to build on our experience to date. With careful public health policy, effective messaging and the utilisation of appropriate technologies, there is no reason we cannot continue to protect all Australians. We all need to take something from our experience during this crisis and just like Chicken Little, realise the sky has not fallen in. With judicious application, technology has helped protect us.

Dr Kris Rallah-Baker
FRANZCO, QLD

RANZCO Blue Light and Digital Screens Position Statement

At the beginning of the year, RANZCO released an evidence-based position statement on the effects of blue light and digital screens on vision. We dive through some key aspects of the statement here.

The harmful effects of blue light from mobile phones, tablets and computers is a controversial issue. Given the mandate of RANZCO's public health committee to improve public awareness by providing accurate, up-to-date information about health risks, RANZCO has responded with an evidence-based position statement. Over the past year, there has been an influx of media articles on the health impacts of blue light and digital screens – some based on misinformation. To reach a position that reflects expert consensus, the public health committee led a collaborative process, with careful consideration given to external stakeholder feedback.

In Summary

No evidence exists to suggest that normal environmental exposure to blue light, including digital screen technology, causes measurable damage to eyesight (unlike UV light, which has a number of potential harmful effects as highlighted in a separate RANZCO UV Eye Protection Position Statement). Filtering out the blue light from screens is not necessary for general use. However, there may be a benefit to reducing screen time in the evening or using night time settings on screens in the few hours before bedtime to reduce interruption to circadian rhythms. General measures to reduce symptoms of eyestrain include taking regular breaks and focussing on distance objects from time to time as well as ensuring spectacles, if worn, are appropriate for the task. The RANZCO position statement recommends consulting a health care professional if symptoms of eyestrain persist.

Key conclusions around the risks associated with normal environmental exposure to blue light include the following:

Sources of blue light: Although people often associate blue light with computers and phones, the largest source of blue light is sunlight. Other sources include fluorescent light, compact fluorescent light bulbs and LED light.

In-built protection from blue light: A small amount of UV light gets through the visible spectrum of the human eye (short wavelength blue light to long wavelength red light) and some infrared will travel through clear ocular media to the retina. The macular pigments (zeaxanthin, lutein, and meso-zeaxanthin) protect the retina by absorbing 40% of the high energy (short wavelength).

Evidence of impact of blue light: While there is some experimental animal data indicating a correlation between blue light exposure and reduced cell viability, these findings cannot be generalised to human light exposure due to the nature of the exposure in the experimental settings being very different to normal environmental exposure.

What is the risk to the eye of exposure to digital screens? Researchers have measured output from some of these devices to inform risk to the eye and found that computer screens and smart phones have a very low level blue light radiance being about <0.5% of the luminance level that the International Commission on Non-Ionizing Radiation Protection consider safe.

Dr Jane Khan
Chair, RANZCO Public Health Committee

General health effects of exposure to light from digital screens

- Night time exposure to blue light from screens can affect circadian rhythms (the biological clock) and suppress melatonin.
- Blue light in the range of 470-490 nm is more effective in phase-shifting the human circadian clock compared to monochromatic light of 555 nm.
- Exposure to light-emitting e-readers at bedtime may negatively affect sleep.

Protecting against digital eye strain

- Regular breaks when reading and using digital devices can be helpful to reduce symptoms of dryness of the ocular surface.
- While blue-light blocking (amber) spectacles can impede the capacity of bright light to supress melatonin production, there is little evidence to show they improve visual performance or conserve macular health.

In Practice

Top Tips to Maintain Social Distancing and Boost Hygiene in your Practice

During this time, to ensure state health guidelines are followed and social distancing measures are maintained within practices, strict but easy guidelines for all team members and patients are required. Here are some top tips to maintain social distancing and boost hygiene in your practice in the midst of COVID-19.

1. Space all waiting room chairs 1.5m apart and place easy visual symbols on the floor for where patients should wait upon arrival/departure at reception.
2. Upon entry to the practice, have a dedicated patient screener to ensure screening criteria are met and temperatures taken.
3. Install automatic hand sanitisers with World Health Organization's (WHO) "How to hand rub" posters.
4. Provide training on hand washing/PPE/COVID19 to all (the DHS has a module everyone can complete and send a certificate).
5. Encourage all patient carers to wait in the car or outside to minimise bodies in the practice. Encourage them to stick to appointment times with minimal waits to ensure time within the practice is also minimised. For elderly/frail/multiple carers, call for them to come into the practice when the doctor is ready to see them.
6. Have your protocols and screening criteria visible on your website and include the link in your SMS reminders, inbox auto replies and phone answering message.
7. Install shields on slit lamps, reception desks and lasers.

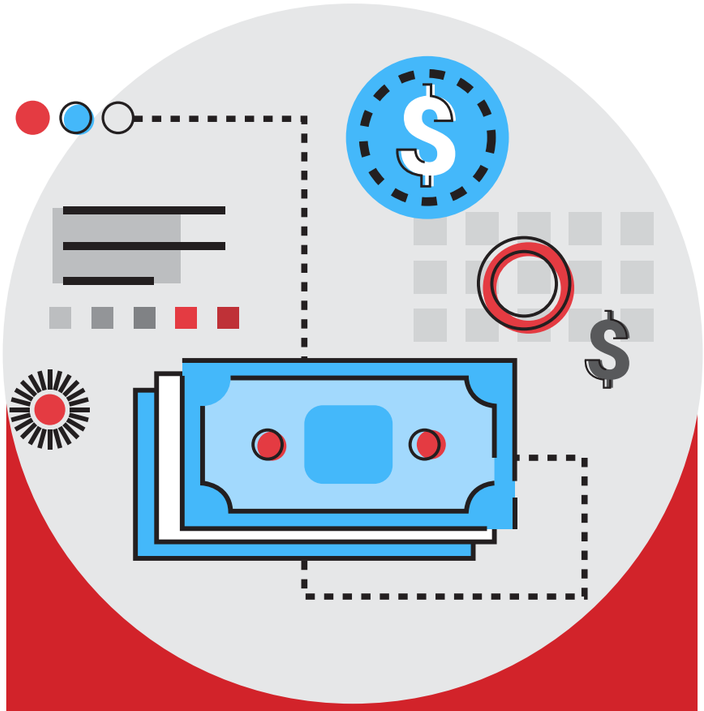
Ideas to Boost Staff Morale During COVID-19

It is also important to ensure everyone in the practice is supported. Here are our top ideas to boost staff morale during COVID-19.

- Make sure communication occurs to ensure everyone is onboard and initiatives are rolled out collectively. Schedule regular Zoom/check in times with all teams to consult and gain feedback when creating new policies/procedures so everyone has ownership of the process. This also allows for everyone to see each other's faces and reconnect with the team.
- Ensure staff feel safe. If they feel safe, there will be a positive mindset all around and work capacity will be heightened.
- Point all staff in the direction of resources for their personal wellbeing, e.g. HeadSpace and DownDog are offering free services to healthcare workers.
- Consider some fancy dress/brightly-coloured scrubs/themed days to divert attention from the doom and gloom of COVID-19.
- Ensure all staff are involved in extra cleaning to the point it almost becomes a competition and the team are motivated to finish work together.
- For team members working from home, ensure that the WHS checklist is completed – the AAPM provides a template.
- Don't forget to maintain birthday recognition, celebrate work anniversaries and other gratitude events.
- Check in with each staff member informally and on a one-on-one basis to see how they're travelling in the new normal of COVID-19.

RANZCO Practice Managers Advisory Group

If you have any specific questions, please post them on the Discussion Board in the RANZCO Practice Manager's Lounge here:



What's it Worth?

Business Vocabulary

Annual revenue is the total turnover or income of a practice.

Average profit is the annual profit averaged over a given number of years.

Weighted average profit is annual profit averaged over a given number of years but giving more weight to more recent profit results. This method either reflects favourably on a practice with growing profits but penalises a business that is losing market share with dropping profits.

Tangible assets is an umbrella term that covers non-fixed current assets like cash holdings and trade debtors plus fixed current assets like plant and equipment and trademarks.

Intangible assets include things like 'goodwill' and there are a few ways to quantify them into a value, with one being a 3.5x multiple of the superprofit.

Superprofit is the maintainable profit that is generated over and above the industry average or normal profit and is calculated as follows:

Average (weighted if applicable) Profit minus fair return (20%) on net tangible assets.
or Average maintainable profit minus normal profit

Total assets are the combined worth of tangible and intangible assets.
Liabilities include things like outstanding loans, GST payable, employee PAYG and payroll tax liabilities and employee leave entitlements.
Net assets are the total assets less the total liabilities.
Return on investment (ROI) is calculated by understanding what money was made less what money was spent in reference to the investment.

Dr Kiran Sindhu maps out the importance of business valuation for Fellows and trainees.

You spent a decade studying medicine and almost the same amount of time building up your practice. What is it worth? This is a question that many established Fellows will ask as they start to consider retirement, succession planning and life after ophthalmology.

Business valuation is also important for newly graduated Fellows who are considering joining an established practice. Understanding the value of a business is basic due diligence in assessing whether the buy-in* price is reasonable and makes a viable business case.

Prior to understanding how to value a business it is important to know a few basic business accounting terms.

What is business valuation?

Business valuation is a process and a set of procedures used to estimate the economic value of a business or part of a business. People use valuation to determine the price they are willing to pay to buy, or buy-into, a business.

What are the general principles?

There are a few ways to value a business and we'll explore the three that are most relevant to medical practices:

1. **Percentage of annual revenue**
   Medical practices make money based on revenue from doctors' billings. On average, a medical practice will make 40-60%, with larger medical practices being at the higher end of the scale. To calculate the worth of the practice, you need to understand the current billing patterns and revenue. Once you know that, and based on the size of the practice, multiply the billings revenue by between 40% and 60%.
2. **Multiple of profit**
   For example, ophthalmology practices usually provide a 3 to 3.5 times multiple on profit. Once you know the average profit of a practice, multiple it by 3 or 3.5.
3. **Net Total Assets**
   This principle takes into account both tangible and intangible assets to arrive at a figure. Average profit (or weighted average profit) is used as a baseline for calculating the Superprofit which in turn is used to estimate a value for the Goodwill (intangible assets) as per the formula outlined under the definition of Superprofit.

There are many ways to value goodwill and these include:

- Superprofit method–only this method will be discussed,
- Average profit method,
- Capitalisation method,
- Annuity method.

Worked example

Let's explore the factors used in each of the valuation methods using a "real" practice.

Vista Central is an established practice with an annual turnover of $2 million. It employs staff and is responsible for payment of all fixed and variable expenses. The annual ophthalmologists' billings (which includes principals and locums) is $3 million. And over the past three years, the profits were:

Last year	- $450,000
Two years ago	- $400,000
Three years ago	- $350,000

It has net tangible assets of $140,000.

This is all the information we need to value the practice.

1. Percentage of annual revenue is based on billings of $3 million multiplied by 45% resulting in a practice valuation of $1.350 million.
2. Multiple of profit shows the average profit is $400,000 and this is multiplied by 3.5 resulting in a practice valuation of $1.400 million. Using a weighted average profit method, the profit will be 416.7K (450 x 3 added to 400 x 2 added to 350 x 1 with the total divided by 6) which when multiplied by 3.5 results in a practice valuation of $1.458 million. This increased valuation using the weighted average method reflects a business showing a future growth trajectory.
3. Total of net tangible assets and intangible assets (Goodwill using the multiple of superprofit calculation method) resulting in a practice valuation of $1.442 million as calculated in the next column.

Valuation based on net tangible assets and intangible assets (Goodwill) using average profit of $400K. Goodwill (intangible asset) can be valued at 3.5x Superprofit.

Superprofit is the average annual profit of $400K (450K + 400K +350K divided by 3) minus a rate of return of 20% on the net tangible assets ($140K) which gives a figure of $372K.

Then 3.5x the Superprofit gives an estimated value for the intangible assets ("Goodwill") of $1,302,000.

Net tangible Assets
$140,000

Then a valuation based on the total of the tangible ($140K) and intangible ($1,302K) assets will give a final figure of $1,442,000.

Thus, Vista Central is valued at between $1.350 and $1.458 million.

A grain of salt

I cannot overemphasise the estimation character of valuation. Although we're using financial principles, business valuation is not an exact science. Ultimately, the value of a practice really depends on future (therefore uncertain) potential and circumstances and values are ultimately set by what the market is willing to pay.

I don't profess to be an expert on this matter but merely provide some background in understanding the concepts of the different ways businesses are valued.

It goes without saying that one should seek their own accounting, financial and legal advice where appropriate when such major business decisions need to be made.

**Buying-in will be discussed in a future article as there are numerous factors, including non-financial ones, that will need to be considered.*

Dr Kiran Sindhu
FRANZCO, NSW

Obituaries

Dr Graeme Warwick Johnson

1 January 1934 – 11 February 2020

"...a man of principle, voracious reader, sensitive and caring about other people, which reflected on his care of his patients."

"You are judged by what you do while passing through."

Graeme Warwick Johnson was born in Leeton and was educated in Artarmon Primary School and The Shore School. He graduated with a Bachelor of Medicine and Surgery at the University of Sydney and moved on to do his residency at the Lewisham and Royal North Shore Hospitals. He did his ophthalmic training as an ophthalmic registrar at St Vincent's Hospital Darlinghurst from 1962 to 1963 and obtained his Doctor of Osteopathic Medicine in Sydney. His overseas training and further studies were done at the Moorfields Eye Hospital in London, specialising in glaucoma under Sir Stephen Miller at High Holborn. He obtained his Fellowship at the Royal College of Surgeons in Edinburgh and was appointed as VMO at St Vincent's Hospital.

Graeme returned to Sydney in 1967 and set up practice in Manly with a session each week in Macquarie Street and at the Medical Eye Service. Subsequently, he became a Fellow of RANZCO.

In 1968, he married Pam Armstrong and a young family followed: Tony, Megan and Mandy. They also fostered and educated David Robertson.

Graeme practised in Manly until 2000 when Dr Simon Irvine took over. He continued to work with Simon until his retirement in 2010. Simon writes, "Graeme was a very good ophthalmologist and a great colleague and teacher. [He was] a kind spirit and astute clinician; kind, gentle, always working with the best interest of his patients at heart. The best workmate anyone could wish for."

In Macquarie Street, he was loved by staff and patients alike. He used to look forward to coming in from Manly and one of the secretaries, Narelle, would buy him a pie for lunch.

They called him Gradie

He was a gentleman – articulate, intelligent, and well dressed (unless he was working on his Triumph). He was always well mannered; a man of principle, voracious reader, sensitive and caring about other people, which reflected on his care of his patients. He was a 'Gentle Man', a 'Good Man', a 'Compassionate Man' and a 'Good Friend'.

With varied interests (included home-made gourmet pies) and a wide circle of friends, he was a man of many parts. The loves of his life were his family and his Triumph Renown, which we all saw at various stages of restoration and which occupied a permanent space in his garage all his practising life. Restoring the Triumph was his labour of love. It was a lifetime's work and when completed, he joined the pre-1954 Triumph Club and attended numerous rallies in Victoria and New South Wales. He also completed a panel beating and chrome plating course. Some of us were privileged to have been driven around Melbourne after it was restored before it was eventually sold when his health deteriorated. As Pam said, "It was a labour of love and he loved the journey."

In the early days, he drove a Fiat 500 named Didimus – small enough to park between two parked cars at right angles in the old driveway at St Vincent's.

Contribution to the College of Ophthalmology

Graeme's contribution to the College has been enormous.

He succeeded Dr David Swan who was Secretary to the then OSA (Ophthalmological Society of Australia) as the first Secretary of the newly formed College of Ophthalmology in 1969. We were MACO then, then FRACO when the Royal Charter was approved and now FRANZCO, after amalgamation of the Australian and New Zealand Colleges.

Graeme, with the help of Margaret Wilson, ran the College from the Medical Eye Service from 1969 to 1975 – just the two of them initially, with little help. They were very dedicated. Graeme had to give up half to one day a week from his practice to read and answer all correspondence by hand in the days before emails and faxes – a monumental task. It was made more difficult when the President came from another state. The load was eased with the appointment of Jim Fair, first Executive Secretary in 1973 and Graeme continued on as Secretary until 1975 when Dr Michael Steiner took over. Graeme had to run his practice in Manly, Macquarie Street and sessions at the Medical Eye Service, including running the Glaucoma Clinic at the Medical Eye Service and the VMO at St Vincent's Hospital.

Graeme maintained his involvement with the Medical Eye Service through the Ophthalmic Association Limited and, as Chair in 1988, transferred the building in Commonwealth Street to the College which was eventually sold to fund the purchase of the building which houses our College today in Chalmers Street.

As Chair of the Ophthalmic Association, Graeme also donated approximately $1M accrued from the Association's investments to fund the new Chair of Ophthalmology at the University of NSW.

Graeme was also active in the Archives Committee with Neville Banks.

Graeme always had tremendous support from Pam especially during some difficult times in the early years with a young family. The Annual Congresses had an organising committee which did all the work to make the Congress successful. There were no conference organisers then. It was all hands-on deck with the ladies filling the satchel with name tags, lists, manning the registration desks, greeting all and knowing everyone – an annual 'family' reunion.

The Accompanying Persons Committee met weekly to organise the programs on the sixth-floor cafe in David Jones. As Pam said, "It was fun, very enjoyable and we knew everybody".

Graeme and Pam, with a wide circle of friends, participated in a variety of activities which included walking, golfing, skiing, and enjoying wine and good food. They walked all over Australia and New Zealand with Club Ped. They organised annual ski trips at Arlberg Ski Lodge where Charlotte Pass was a highlight. Graeme even conquered the dreaded 'funnel web' in Thredbo and was quoted as saying, "We came, we saw, we conquered".

Their son Tony's death was a devastating blow to the family.

The last years more especially tough as Graeme's condition deteriorated. Pam and Graeme have faced this with courage, resilience, compassion and humour. Pam was a tower of strength as she cared for Graeme, with love and devotion, and with the help and support from Meg, Mandy, Rubi and family and friends.

Graeme is now at peace – free from pain and suffering, at peace where the angels learn to fly.

The reflection below was read at Graeme's funeral:

He is Gone

You can shed tears that he is gone
Or you can smile because he has lived
You can close your eyes and pray that he will come back
Or you can open your eyes and see that he has left
Your heart can be empty because you cannot see him
Or you can be full of the love that you shared
You can turn your back on tomorrow and live yesterday
Or you can be happy for tomorrow because of yesterday
You can remember him and only that he is gone
Or you can cherish his memory and let it live on
You can cry and close your mind, be empty and turn your back
Or you could do what he would want,
smile, open your eyes, love and go on.

A musical tribute was played to honour Graeme and to also serve as a comfort to those left behind.

Graeme is Going Home

It's not far just close by
Through an open door
Work all done care laid by
Going to fear no more.
Mother's there expecting me
Father's waiting too.
All the folks gathered there
All the friends I knew
All the friends I knew
I'm just going home.

Imagine Graeme being greeted by and reunited with his mother, father and his beloved Tony.

Graeme was survived by his wife Pam, daughters Megan and Mandy, and grandchildren Lili, Jack and Ollie, and the extended family. He will be fondly remembered and missed by all his family, friends, colleagues and patients.

Dr Frank Cheok OAM
FRANZCO, NSW

Dr William Thomas Hudson Scales

22 February 1918 – 2 April 2020

Bill was born in England near Salisbury, Wiltshire and emigrated to Sydney in 1919 where the family lived at Epping. He attended the local public school and then Sydney Grammar School, where he gained the Wigram Allen prize for Honours Mathematics in his final year in 1935. He also became the leader of the Rifle Shooting Team and excelled in that sport both at school and later at University, where he received his Blue in 1939.

In 1935, Bill was enrolled in Medicine 1 at Sydney University and graduated MB BS with Honours in 1940.

In 1941, he became a Junior Resident at Sydney Hospital and in November that year, joined the RAAF as a Squadron Medical Officer. During WW2, Bill served in operational areas at Darwin, as well as Dutch New Guinea, Borneo and Labuan, finishing the war as a Squadron Leader. He was at Labuan when the atomic bombs were dropped at Hiroshima and Nagasaki and was repatriate to Sydney in November 1945.

Bill then became a surgical registrar at Sydney Hospital for six months before starting post–graduate training in ophthalmology at the Sydney Eye Hospital. He received his Diploma in Ophthalmology from Sydney University in 1948 and with his wife, Patricia, went to Lismore in northern NSW as an assistant to Dr T Boyd Law for 12 months. He was an Honorary Ophthalmologist to both Lismore Base Hospital and St Vincent's Private Hospital in Lismore.

In 1949, Bill moved the family to Grafton and took up a deceased ophthalmic practice, where he practiced for 25 years. Bill was a member of the Ophthalmic Society of Australia and when it became the Royal College of Ophthalmology for Australia, he became a member. Finally in 1978, he became a Fellow of the College. During the Grafton years, he also had a branch practice at Coffs Harbour and was a Senior Honorary Specialist at both Grafton Base Hospital and Coffs Harbour Hospital.

"In recognition of Bill's work in this area, he received an Order of Australia Award in 2007.

In April 1974, they left the Clarence Valley and Bill took up a position as the Consultant Specialist in Ophthalmology for the Department of Veteran Affairs in South Australia and the Senior Ophthalmologist at the Repatriation Hospital in Daw Park, Adelaide. This appointment carried with it a position at the newly formed Medical School at Flinders University. Bill also had an honorary position at the Children's Hospital, where he conducted outpatient clinics.

In conjunction with Dr Donald Perriam, he developed the Department of Ophthalmology and Bill serviced the first outpatient clinic at the new school. He was a Senior Clinical Lecturer at Flinders and held that post until the full time Professor, Dr Douglas Coster, was appointed from England.

In 1976, Bill joined with Prof Fred Hollows in the original Trachoma and Eye Health Program. This consisted in, as near as possible, a complete survey of the eye health of the Aboriginal and white population in the remote areas of the northern part of South Australia. They were based at Armata and spread to Ernabella North and Indulkana and Coober Pedy South. Following this, Bill took over the eye care of the Aboriginal people in the far west of the state. He used to visit about twice a year and later, up to four visits. Accompanied by general practitioner, Dr Richard Jolly, they travelled to Yalata, Coonibba and Koonalda and, by Richard's twin engine Cessna, to Maralinga and thence to Oak Valley. Bill also did further visits to the areas they had already surveyed when no one else was available. In recognition of Bill's work in this area, he received an Order of Australia Award in 2007.

Bill had to retire at the end of 1982 from both hospitals as his 65th birthday approached but, not being ready to fully retire, did locum work. This took him all over Australia, with some time in the Northern Territory at Darwin and Alice Springs as well as all the eastern states.

He finally stopped all ophthalmology in 1995 at age 77 and found other interests. One major occupation post-retirement was serving as a consultant on the Pensions Committee for Adelaide Legacy, taking the appeal cases for War Widows to the Veterans Review Board, where Bill's medical expertise and knowledge of DVA being of particular help.

At age 97, Bill and Pat returned to the Clarence Valley, to Yamba, to spend their final years. This was a very special time, with two of their four daughters retired there and a community who welcomed back their beloved Doctor Bill and his beautiful wife. For Bill particularly, the pleasure he gained from reconnecting with patients he had treated as children, and nurses with whom he worked at Grafton Base Hospital, made this final move a real homecoming.

Bill was a wonderful husband and father, and a genuinely good man who will be fondly remembered by many.

Deb Thomson
Dr Bill's eldest daughter

Dr Bill Scales performing remote ophthalmology

Classifieds

Positions Vacant

Full-time Pediatric Ophthalmologist

Wanted – Full time ophthalmologist for large private practice in Newcastle, a seaside town two hours north of Sydney.

The population drainage is one million. There is no paediatric ophthalmologist currently working in the area.

This position would be for a full time paediatric ophthalmologist working in both private and public, and a hospital appointment would also be guaranteed with both private and public operating theatre lists.

P: +61 2 4929 5969
E: anthea@neweye.com.au

General Ophthalmologist — Newcastle

General ophthalmologist with interest in glaucoma/medical retina to join and ultimately take over busy Newcastle based practice.

P: +61 2 4929 5969
E: anthea@neweye.com.au

Full/Part time Ophthalmologist — Hobart

This position is offered on a full or part time basis.

Our facilities include fully computerised equipment such as OCT, Fluorescein angiography, SLT, Yag & Argon lasers and fundus photography.

You will be working with a team of ophthalmologists with support staff including optometry. We specialise in cataract surgery, diabetic & glaucoma management and general ophthalmology. We have a high surgical volume.

We are offering an attractive salary package or percentage–based associateship. Early Equity is available for the suitable candidate.

C: Dr Gordon Wise
P: 0419 379 214
E: gordonwise@netspace.net.au.

Paediatric/General Ophthalmologist — Newcastle

Paediatric/General Ophthalmologist required two days a week to join or locum in a busy general/paediatric practice that sees most of the paediatric patients in Newcastle, NSW (90 minutes from Sydney CBD).

We are fully equipped with OCT, FFA, Pentacam, IPL, optical biometry, SLT/YAG/Argon lasers, portable slit lamp and auto refractor. This is an area of need (DWS).

P: 0416 221 022
E: jvongpha@yahoo.com

Vitreo Retinal Surgeon

Wanted urgently - VR surgeon to join and ultimately take over busy Newcastle based practice.

Great lifestyle and great professional opportunity. Strong possibility of public hospital appointment with Hunter New England Health Service with fee for service payment.

P: +61 2 4929 5969
E: anthea@neweye.com.au

Associate or Locum Position Available — NSW

Busy Hunter Valley practice requires FRANZCO accredited associate or part time locum for our Singleton and Muswellbrook clinics. Days are flexible. A private surgery list will be available for the right applicant.

Our practice features a solid client base, fully equipped consulting rooms featuring the latest ophthalmic equipment, fully trained and knowledgable ophthalmic technicians and administrative staff.

Sub–specialty training in medical retina would be an advantage but is not mandatory.

C: Jami Street
P: +61 2 6572 2522
E: practice@eyecentre.net.au

Fifth year registrar position - Sunshine Coast, QLD

A new fifth year registrar position has been established on the Sunshine Coast. This post will a provide comprehensive ophthalmology clinical experience with high surgical volume. It will feature significant subspecialty exposure in the areas of oculoplastics, paediatrics and medical retinal.

For full details on this position visit www.ranzco.edu/classifieds

E: afoster@goldeneyeclinic.com

Private Practice Ophthalmology Opportunity— Townsville

Seeking an ophthalmologist to work in a long established Townsville, Queensland practice with an older general ophthalmologist.

The practice is located in a modern, custom built premises with up to date equipment.

E: enquiries@adminqophth.com
P: +61 7 4779 8008

Ophthalmologist - South Coast, NSW

Opportunity to step into a busy and long-established country practice in Nowra. Extensive cataract, glaucoma and medical retina work. Would suit a general ophthalmologist, full-time or flexible part-time, with or without a sub-specialty focus.

- Modern premises with six consulting rooms
- Testing rooms and procedure room
- YAG/SLT and retinal lasers, OCT, IOL Master, FFA, VF, wide-field imaging, A/B-scan.
- 5 minute drive from public and private hospitals
- Close to beaches, private schools and the Southern Highlands

P: 0412 149 910
E: manager@southvieweyes.com.au

Fellowship in Medical and Surgical Retina - Sir Charles Gairdner Hospital - Perth, WA

The Department of Ophthalmology within Sir Charles Gairdner Hospital, based in Perth, Western Australia, offers a Vitreoretinal Fellowship with accreditation by both the Royal Australian College of Surgeons & RANZCO.

The next Fellowship position is due to commence in January 2021 with duration of 12 months.

P: +61 8 9457 4718
E: Lea.Jamieson@health.wa.gov.au

Ophthalmologist — Melbourne

Modern (paperless) clinic within 7km north of Melbourne CBD. Equipment includes Zeiss cirrus HDT 5000 OCT, Zeiss Visucam 524 photo-Angiography, HVF, Lenstar, topography etc.

An adult patient clinic, predominantly cataract glaucoma and retina. An opportunity to grow your own subspecialty practice with support.

Flexible sessions and remuneration options.

P: 0418 708 878
E: merceks@gmail.com

Glaucoma Sub-Specialist –Canberra

Great opportunity for an enthusiastic ophthalmologist in Canberra, particularly suited to a glaucoma subspecialist.

Could include a good mix of general ophthalmology with high volume cataract surgery and intravitreal anti-VEGF therapy.

This would be a full time position and would not be suitable for fly in fly out practice.

P: 0418 211 463
E: eyecare@aapt.net.au

Equipment for Sale

Items for Sale

- Zeiss Visulas Yag He Ne Laser
- Heidelberg HRT-3
- Heidelberg HRT-3 on electric table with ACER Laptop.
- Tomey Biometer AL 100
  Current model in excellent condition, hardly used

All items located in Croydon, Victoria.

P: 0419 887 888
E: tom18chia@gmail.com

Zeiss CIRRUS 4000 HD-OCT

In excellent condition. Regualrly maintained and serviced under a Zeiss Optime Contract. Comes with table.

P: +61 2 4721 5899
E: marcelleg@nepeaneye.com.au

Original B and L Keratometer $500

Evoke Dx electrophysiology machine (still in the box so brand new) cost $70,000, all offers considered. Good for glaucoma suspects and neuro-ophthalmology patients.

P: 0438 011 963
E: pamweir@me.com

Items for sale:

- Zeiss Cirrus OCT-4000
- Zeiss Visucam 500 Fundus Camera and Angiography
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Food for Thought

Life After the COVID-19 Pandemic

Prof Peter McCluskey describes the changes ophthalmology has undergone as a result of COVID-19 and explores what future eye care looks like post-pandemic.

The rapid spread of COVID-19 throughout the world in a matter of weeks is a catastrophic, once in a lifetime event that has radically changed the world. There will be enormous economic and social fallout. The pandemic has overwhelmed medical care in many nations and exposed the fragile nature of medical logistics and its supply chains.

As there is no specific anti-viral therapy and a low likelihood of an effective vaccine at any time soon, it will be many years before we arrive back at a "normal" life after the COVID-19 pandemic, if we ever do.

Social distancing, frequent hand washing, enhanced cleaning, PPE use, and COVID-19 screening will be the "new normal" for years. Hospital-based models of medical care will have to change. This is particularly relevant to ophthalmology where crowded, under-funded, public sector hospital-based clinics provide equity of access to the disadvantaged in our communities and tertiary level care for those with complex eye disease.

As a uveitis specialist working at Sydney Eye Hospital, my unit looks after many patients on systemic corticosteroids and immunosuppressive therapy. We have had to restrict our clinic numbers to those with active vision threatening uveitis requiring urgent assessment and treatment, and have deferred as many patients as possible. We are monitoring many patients remotely and via telehealth.

"Social distancing, frequent hand washing, enhanced cleaning, PPE use and COVID-19 screening will be the 'new normal' for years."

As Director of a large eye research centre (The Save Sight Institute), I had to close our research labs, get all staff to work remotely, suspend clinics, stop electrodiagnostic testing and pause our clinical trials. We are now just about to cautiously restart clinical trials and onsite work in a careful, staged way. It will be many months, if ever, before we return to "business as normal".

My life as an educator has changed for good. All hospital and university-based teaching activities are now conducted remotely, mostly via Zoom conferencing. Zoom and similar platforms allow rapid sharing of high-quality images and interactive presentations where everyone can hear and interact with the presenter. This has been a huge step forward for ophthalmology trainees at Sydney Eye Hospital who rotate across Sydney as well as to rural NSW, Darwin and Hobart. There is now equity of access to teaching, as the tyrannies of Sydney traffic and rural/remote postings are gone.

Future eye care will be very different. Eye disease commonly affects older people who often have systemic co-morbidities, placing many in high risk groups for COVID-19 infection. Crowded hospital outpatient clinics are no longer safe. Many of our patients are terrified they will catch COVID-19 at our clinics and are deferring critical care. Social distancing and infection control measures will greatly restrict hospital patient numbers for both clinics and eye surgery for years to come. Aerosol-generating surgical procedures require high level PPE and cleaning which greatly impacts patient throughput.

We have to redesign our models of care to greatly decrease dependence on our overcrowded, poorly resourced hospital-based services. Our aging baby boomer population will generate large increases in patients needing eye care. There are already very effective community based multi-disciplinary shared care models for glaucoma, diabetic retinopathy and cataract in operation in Western Sydney, run by the Discipline of Ophthalmology at Westmead. There are high throughput remote glaucoma screening and management clinics operating via Moorfields Eye Hospital in London that rapidly and effectively manage very large patient numbers. Western Australia has very effective telehealth programs for remote communities. There are many others. Ophthalmologists will need to lead these multidisciplinary eye health care teams and manage the use of community-based screening and digital technology.

Ophthalmology has to shift to personal digital technology and telehealth whenever possible. There are already apps and attachments for phones that assess visual acuity and capture high quality digital fundus images and OCTs. There are remote IOP measuring devices. We will need to use artificial intelligence to manage and interpret the large amounts of data.

I now manage a significant number of my patients via telehealth. This is far more useful and effective than I envisaged. I recently conducted my outreach uveitis clinic at the Royal Hobart Hospital from my study in Sydney by pre-organising protocols to assess the patients and then reviewing them via a combination of emails to transmit the images and conference calls with the ophthalmologists, eye trainees and co-managing rheumatologist in Hobart.

Through the Special Interest Groups of RANZCO, we have an opportunity to set up sub-specialist networks to provide telehealth and web-based diagnostic and management advice across Australia and New Zealand. RANZCO should lead the development of these new systems for blinding eye disease.

There are similar great opportunities for research into eye disease. The disease phenotype and outcome data generated via all this new technology can be pooled to generate large databases and registries that will lead to diagnostic breakthroughs and improved treatment algorithms.

The future of eye care will be different. There will be challenges, but the opportunity and time to re-imagine the eye health care of Australians and New Zealanders is now.

Prof Peter McCluskey
FRANZCO, NSW

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