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Centre for Eye Research Australia Limited

A.B.N. 72 076 481 984

ANNUAL REPORT 2001

Includes a review of the activities of the
University of Melbourne Department of Ophthalmology
and the Eye Research Foundation 2001 Report





CENTRE FOR EYE RESEARCH AUSTRALIA

Mission:

To eliminate vision loss and blindness in our community.

Goals:

1. Through research contribute to the determination of the causes of major conditions that lead to vision impairment.
2. Through research promote early recognition and detection of potential vision impairment.
3. Through research develop and promote models of optimal care for people with vision impairment.
4. Through research develop and promote methods to reduce vision loss and its impact in 'at risk' groups including the elderly and indigenous populations and rural and remote communities.
5. Promote informed choice by improving community access to relevant information about eye health.
6. Enhance the quality of research outcomes through strong partnerships with government and non-government agencies.
7. Maintain international status as a WHO Collaborating Centre for the Prevention of Blindness.

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Chairman's Report



In this my final report as Chairman of CERA, it is heartening to report that 2001 has been a most successful year in a number of ways. In a climate in which government funding for medical research has been further reduced and the competition for corporate and private support has continued to increase, it is a tribute to the reputation of CERA that it has not only maintained but has increased its research funds.

This reputation, both national and international, is built upon the work of our Managing Director, Professor Hugh Taylor AC, and his research team, ably supported by the administrative staff. All organisations require an effective leader and in this difficult economic environment, CERA could not be better served than by the indefatigable Hugh Taylor whose workload defies belief.

His contribution to ophthalmologic research, education and the formulation of eye health policy was appropriately recognised this year in the Queen's Birthday Honours, when he was appointed a Companion in the General Division in the Order of Australia.

Perusing CERA's goals, published at the beginning of this Annual Report, one obtains an understanding of the enormous challenge facing Professor Taylor and his staff. The reports that follow demonstrate the impressive degree to which these goals have been reached in 2001, bringing CERA closer to its mission to eliminate vision loss and blindness in our community. These results are even more remarkable when one remembers that CERA was only established in 1996. I would like to pay tribute to Professor Taylor and each member of his staff for their efforts this year. Vision impairment is something of a hidden health problem in our community and CERA staff have worked tirelessly to strengthen its position on the public health agenda.

I should also like to record my thanks to the CERA stakeholders: the University of Melbourne, the Royal Victorian Eye and Ear Hospital, Vision Australia Foundation, Royal Victorian Institute for the Blind, Christian Blind Mission International, Royal Australian and New Zealand College of Ophthalmologists (Victorian Branch), Kathleen and Lloyd Ansell Ophthalmology Foundation, and Victorian Lions Foundation. Each of these organisations provides a representative on the CERA Board and their commitment and practical assistance throughout the year have been greatly appreciated.

Equally importantly, gratitude is due to the private and public benefactors who are the lifeblood of CERA. Your continued support has enabled the staff to advance their research and you too are stakeholders in CERA.

Finally, I wish CERA's new Chairman, Mr Charles Macek, the very best, confident in the knowledge that he will provide strong leadership, and will be as warmly supported by the CERA team as I have been.

Professor Graeme Ryan AC



Managing Director's Report



When one sits down to write a summary of the year's activities, one tries to find a theme that draws the year's work together or a particular highlight. Some years it is all about change or challenges or how hard it is to get money. In some ways these are constant and consistent issues that confront us everyday, although some years much more so than others.

The year 2001 was one of achievement and the recognition of this achievement. Sir Stewart Duke Elder, the mid-twentieth century doyen of ophthalmology in the English speaking world, used to say all you needed to do research was running water and a good idea. Al Sommer, the Dean of Public Health at Johns Hopkins, pointed out that for epidemiology research you really did not need to have the running water. However, even with a good idea, epidemiology research takes a long time, and it often feels as though not much is happening even though everyone seems busy. Work on the Melbourne Visual Impairment Project started in 1991 and we are still analysing the data we collected during its eight years of fieldwork. Similarly, the first discussions about the Vitamin E Cataract and Age-related Macular Degeneration Trial (VECAT) took place in 1990 and the results first became available in 2001.

With CERA staff having done the 'hard yards' and years of work, 2001 was marked by the recognition of the importance and quality of our work, both nationally and internationally. The most important annual scientific meeting in eye research is the Association for Research in Vision and Ophthalmology (ARVO) meeting in Florida. This year there were over 5,000 presentations from all over the world in its very busy program. Only nine were selected as 'Red Hot Topics' of great importance and interest. Two of these nine were the VECAT results, one on cataract and one on macular degeneration. This is extraordinary recognition and is a bit like being 'the best bull of the show' at the Melbourne Show. Luba Robman, Cathy McCarthy, Gabriella Tikellis, our colleague Professor John McNeil from Monash, and the rest of the VECAT team can be very proud of this achievement.

The time, effort and money that have gone into the Visual Impairment Project are paying tremendous dividends both in Australia and internationally. This decade-long study has clearly shown the importance and causes of vision loss and eye disease in our community. It has enabled us to project what our future needs will be and it has allowed us to identify a number of relatively simple steps that should be taken to prevent unnecessary vision loss in the future. In 2000 we had crystallised these messages into a small book, *Eye Care for the Community*. This book was extraordinarily useful and the 3,000 copies were distributed very quickly. We updated and reprinted this in 2001 and again I would like to thank Mr David Jones and the Estate of the late George Adams for their assistance in this.

As a result of the recognition of the importance of our findings by State and Federal Governments, we were invited by the Government of Victoria to develop a proposal for a Vision Initiative in Victoria. We were also asked by the Commonwealth and ACT Governments to explore a similar proposal for the ACT.

We envisage a large scale, long-term Vision Initiative as a major public health program to promote and protect people's good vision. We hope it may become as well established and recognised as the Quit Campaign to stop smoking. Obviously this is a huge undertaking which is beyond the resources of CERA and needs a collation of a broad range of stakeholders. Fortunately the Australian Community Committee of Vision 2020 Australia has taken up this cause and we have high hopes for its success. I particularly want to thank Kathryn Taylor, Carley Nicholls, Rebecca James, Maree Davidson and Helen Egan for their help with this, and the John T. Reid Charitable Trusts, Allergan Australia and Alcon Australia for their support. Michael Lynch, a CERA Board member, CEO for Vision Australia Foundation and Chairman of the Australian Community Committee, has also played a major role in developing this initiative.

Our work on the epidemiology of eye disease has also been recognised by a number of invitations to lecture, including the Nigel Gray Lecture of the Victorian Public Health Research and Education Council, the Fred Hollows Lecture of the Australian Ophthalmic and Visual Science Meeting, and lectures to the Japanese Ophthalmological Society and the American Academy of Ophthalmology. It also provided the basis of an 'Ockham's Razor' presentation on ABC Radio National. (<http://www.abc.net.au/rn/science/ockham/stories/s321025.htm>)

The quality of our work has been recognised in other ways: the Lions Eye Health Program Australia has now been extended from the Western District of

Victoria to be Australia wide, and Jill Keeffe and Karen Bradshaw are much in demand as this public education campaign focusing on diabetes and glaucoma is rolled out across the country. Similarly, the Lions Low Vision Initiative, also led by Jill Keeffe, is working in Victoria and in Fiji. We greatly appreciate the ongoing support from many Lions who give so much of their time, but particularly David

Welsh who wears many hats, Alan Roberts and George Barnard.

The leadership and experience of many CERA staff was also recognised by frequent requests to lecture and advise both in Australia and overseas. Associate Professor Hector Maclean analysed confidential data and provided consultancy reports for various

Commonwealth Government agencies and sat on a Medical Services Advisory Committee. Jill Keeffe was elected Pacific President of the Institute of Low Vision Society, and Cathy McCarty was appointed a member of the Program Committee for ARVO. Dr Graeme Pollock was elected to the position of Secretary of the Australasian Transplant Coordinators Association and appointed to the Advisory Committee of the Victorian Organ Donation Service.

Personal achievement was also recognised. We were especially pleased when Jill Keeffe's many accomplishments were recognised with her promotion to Associate Professor. Jill, Professor Keeffe, has provided great leadership and inspiration to CERA as a whole and to the Eye Health Promotion Unit in particular.

It was most fitting that a member of the Eye Health Promotion Unit, Jenny Hassell, was selected to



Professor Taylor receiving the American Academy of Ophthalmology's 2001 International Blindness Prevention Award

receive the 2000 CERA Research Award. The Award was presented by the Governor of Victoria John Landy AC, MBE at the CERA/ERF Annual Meeting in July. Jenny gave a moving acceptance speech which appears elsewhere in this Report.

For me, recognition came at a personal level this year. I was made Companion in the General Division of the Order of Australia in the Queen's Birthday Awards for my work in the prevention of river blindness in the third world, service to academia through research and education related to the prevention of eye disease, and development of policy on eye health in indigenous communities. This was a tremendous personal thrill, but it reflected the great work to which a whole team of people has contributed. It was wonderful that my wife, Elizabeth, was recognised at the same time for her own work in HIV/AIDS and drug abuse.

During the year I became the ninth recipient of the International Blindness Prevention Award for the American Academy of Ophthalmology.

We were particularly sorry to farewell Cathy and Dan McCarty during the year. Cathy was the Head of the Epidemiology Unit and oversaw the VIP and VECAT studies. She had been with us for eight years and had played such an important role in the growth and development of CERA. During that time she became a wife, a mother and an Associate Professor and was a member of the University Council. We all miss her big smile, bubbly enthusiasm and scientific rigour. Dan also was an important member of CERA and had led the Clinical Research Unit for two years. We wish Cathy, Dan and Sean well in their new home in Marshfield, Wisconsin.

In the last part of the year we were pleased to move into some newly renovated offices. Mrs Aline Darke and the RVEEH Auxiliaries very generously assisted us with some long overdue renovations to enable the old electron microscopy and bioengineering labs to be converted to modern offices for staff and students. These renovations have had a profound impact on our working environment and we are extremely grateful. It was wonderful to have the

refurbished offices opened by Mrs Lynne Landy, wife of the Governor of Victoria.

As this Annual Report shows, 2001 has been another busy and successful year- the result of the hard work and dedication of many people. I must first thank Professor Graeme Ryan AC, Chairman of the CERA Board, who took over at the end of 2000 from our founding Chairman, Michael Tilley. Graeme has been a source of help and a great supporter of CERA, and it is unfortunate that he has indicated he will step down in 2002. I also want to thank the rest of the CERA Board for all their assistance and specifically to welcome Michael Lynch who joined us as the representative of Vision Australia Foundation.

I also want to thank Mrs Diana Jones AM, Chairman of the Eye Research Foundation, the Trustees and the members of the ERF Fundraising Committee, the staff and volunteers and supporters of the ERF. Diana is a creative and tireless worker who is an inspiration to us. We all benefit from and appreciate the hard work, dedication and commitment of the ERF and the support it provides.

Again I want to thank Joe Carbone and the staff of the RVEEH for their support and assistance, as well as the staff of the various University departments we have so much to do with. Finally I would like to thank all the staff of CERA who do such a fantastic job. The staff are now too many to mention individually and their achievements are listed throughout this Report. I must, however, specifically thank Judy Carrigan who successfully juggles my time and commitments so my feet almost never touch the ground and I am always more or less in the right place at the right time.

After all these accolades it must be time to get back to work and make sure that 2002 is as successful as 2001 has been.

Professor Hugh R. Taylor AC



Members of CERA, the Department of

CERA Board of Directors

Professor Graeme Ryan AC, Chairman
Dr Trevor Anderson
Mr John Jeffries
Hon. Dr Barry Jones AO
Mrs Diana Jones AM
Professor Richard Larkins
Mr Michael Lynch (from January 2001)
Dr Mark McCombe
Mr Charles Macek
Mr Philip Molyneux, Treasurer
Professor Hugh Taylor AC, Managing Director
Mr David Welsh

Company Secretary: Mr David Doyle

CERA Finance & Audit Committee

Mr Charles Macek, Chairman
Mr Philip Molyneux
Professor Graeme Ryan AC
Professor Hugh Taylor AC

Investment Committee

Mr Charles Macek
Mr Philip Molyneux

CERA Research Committee

Associate Professor Justin O'Day, Chairman
Professor John Funder AO
Professor John Furness
Mr Philip Molyneux
Professor Graeme Ryan AC
Professor Hugh Taylor AC

Eye Research Foundation

Patron: John Landy AC, MBE, Governor of Victoria

Mrs Diana Jones AM, Chair
Ms Belinda Byrne (from June 2001)
Professor Emeritus Gerard Crock AO (from
September 2001)
Professor Derek Denton (from September 2001)
Mr David Doyle, Secretary
Mr Charles Macek (from September 2001)
Mr Philip Molyneux, Treasurer
Mrs Margaret Ross AM (from April 2001)
Professor Graeme Ryan AC (from January 2001)
Professor Hugh Taylor AC

Fundraising

Mr Greg Romanes, Executive Director
Ms Elizabeth Douglas, MA, Bequests Manager



*Eye Research Foundation (l-r)
Volunteers Mrs Maureen Moore and Mr Jude
Sebastian with Mr Greg Romanes and Ms
Elizabeth Douglas*

Ophthalmology and the ERF, 2001 cera



Head of Department of Ophthalmology and Ringland Anderson Professor

Hugh Ringland Taylor, AC, MD FRANZCO

Professor Emeritus

Gerard W. Crock AO, KStJ MB BS FRCS FRACP FRANZCO FRACS

Undergraduate and Registrar Teaching

Associate Professor Hector Maclean, MB ChB St And DO Lond. FRCS Edin. FRANZCO FRCOphth

Dr Deb Colville, MB BS FRANZCO FRACS, Grad. Dip. Epidemiology, Master of Public Health, Grad. Cert. of Vocational Ed. & Training (Clinical Instruction)

Mr Mohammad Arshad Peerbux, Undergraduate student, Needs Analysis Study

Research Staff

Clinical Research Unit

Dr Bickol Mukesh, PhD, Research Fellow,
Unit Head (from May 2001)

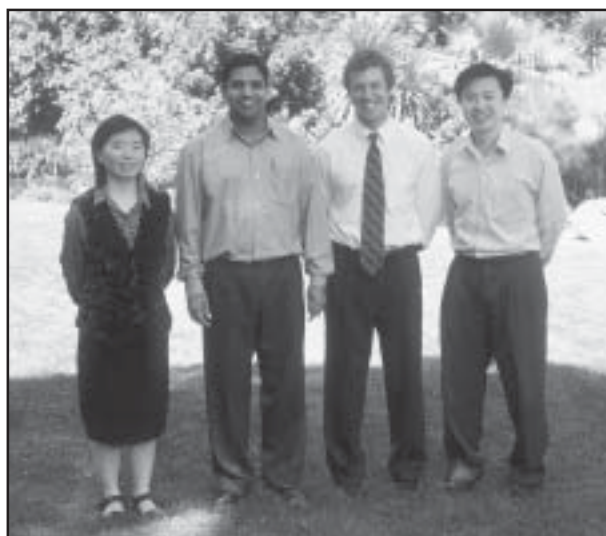
Dr Daniel McCarty, PhD, Senior Research Fellow,
Unit Head (to May 2001)

Dr Anhchuong Le, MBBS, Honorary
Research Fellow

Mr Todd Robin, MHS, Research Fellow

Dr Qing Yi, MB, MPH, Research Fellow,
Health Outcomes

Dr Mimiwati Zahari, FRCSEd, MS(Oph),
Honorary Research Fellow



*Clinical Research Unit (l-r)
Dr Qing Yi, Dr Bickol Mukesh, Mr Todd Robin,
Dr Anhchuong Le*

Corneal Research Unit

Dr Grant Snibson, MB BS DipRACOG FRCOphth (UK) FRANZCO FRACS FAICD
Senior Lecturer, Associate Medical Director, Lions Eye Bank

Dr Graeme Pollock, PhD, Deputy Director, Lions Eye Bank

Mr Mark Lowe, BAppSc, Transplant Co-ordinator (to January 2001), Lions Eye Bank

Ms Melissa Goodman, BSc (Hons), Transplant Co-ordinator (from March 2001), Lions Eye Bank

Mr Sean Mathews, RNBN Grad Dip CCN, Transplant Co-ordinator (from May to September 2001),
Lions Eye Bank

Mrs Prema Finn BSc (Hons) (from November 2001), Lions Eye Bank

Epidemiology Research Unit

Associate Professor Cathy McCarty, PhD MPH
BS, Principal Research Fellow, Unit Head
(to July 2001)

Dr Liubov Robman, PhD MB BS (Alma-Ata),
Ophthalmic Research Fellow and Field
Co-ordinator, CHARM Study (Acting Unit
Head from July 2001)

Mr Peter Dimitrov, BOrth, Orthoptic Research
Assistant, CHARM Study

Mr Adam Dowrick, MAppSc, Carotid Artery
Research Assistant, CHARM Study

Ms Cara Fu, BAppSc, Data Manager
(to April 2001)

Dr Bickol Mukesh, PhD, Biostatistician,
(to May 2001)

Mrs Caroline Nicolas (formerly Cretin), BSocSc,
Research Assistant, CHARM Study

Ms Sonya Ristevski, BSc(Hons), Research Assistant, CHARM Study

Mrs Suzanne Wright BA, Research Assistant to Professor McCarty (to March 2001)



*Epidemiology Research Unit staff (l-r)
Mr Peter Dimitrov and Mr Adam Dowrick
measuring the pulse velocity of a volunteer in
a clinical trial*

Postgraduate Students Epidemiology Research Unit

Mr Simon Barty, Part-time MSc student, Visual Impairment Project

Ms Rakhi Dandona, Baccalaureate in Optometry, PhD student

Ms Gabriella Tikellis, BSc Grad Dip (Epi & Biostat), PhD student, Research Assistant, CHARM Study

Eye Health Promotion Unit

Associate Professor Jill Keeffe, PhD, Principal Research Fellow, Unit Head

Dr Alex Harper, FRANZCO FRACS, Senior Lecturer, Early Detection of Diabetic Retinopathy and
Koori Eye Care Program

Ms Karen Bradshaw, DipDT, Cert Health Promotion (Oral), Cert Health Promotion, Senior Research
Fellow, Program Manager, Lions Eye Health Program (LEHP) -Australia

Mr Anthony Carnicelli, BOrth, Research Assistant, Project Coordinator, Vision Screening of Older Persons
(to September 2001)

Ms Leanne Harris, BAppSc(Hons), Research Assistant, Eye Health Promotion Unit (from August 2001)

Ms Jennifer Hassell, BA BAppSc Dip Ed, Research Assistant, Impact of Vision Impairment Profile

Ms Jodi Oswald, BSc, Senior Research Assistant, Evaluation of Rehabilitation Programs (from June 2001)

Ms Tamara Pollard, BOptom, Project Officer, Low Vision Lions Initiative (from March 2001)

Mr John Simpson, Project Officer, Low Vision Lions Initiative (from March 2001)

Dr LeAnn Weih, PhD MS BS, Research Fellow, Epidemiologist

Mrs Suzanne Wright, BA, Research Assistant to Dr Keeffe (to November 2001)



Eye Health Promotion Unit (l-r)

*Ms Jennifer Hassell,
Dr Claire Hooper,
Associate Professor
Jill Keeffe,
Dr Van Lansingham,
Ms Leanne Harris,
Ms Karen Bradshaw,
Mr John Simpson,
Ms Jodi Oswald*

Postgraduate Students Eye Health Promotion Unit

Dr Van Lansingham MD
Dr Claire Hooper MB BS

Undergraduate Student Eye Health Promotion Unit

Mr Stanley Tay

Visiting Fellows Eye Health Promotion Unit

Dr Dao Thi Lam Huong, Institute of Ophthalmology, Hanoi, Vietnam
Dr Le Thuy Quynh, Institute of Ophthalmology, Hanoi, Vietnam

Glaucoma Research Unit

Dr Julian Rait, FRANZCO FRACS,
Senior Lecturer, Unit Head
Dr Jamie Craig, MB BS BMedSc DPhil,
Research Fellow
Mr John Ferraro BOrth. Orthoptist
Ms Danielle Healey, BSc(Hons),
Grad. Dip. (Couns), Research Co-ordinator
Associate Professor David Mackey, MD MB BS
Tas, FRANZCO FRACS
Ms Rachel McKinstry, BOrth, Orthoptist
Mr Todd Robin, MHS, Research Fellow



Ms Rachel McKinstry measuring a patient's intraocular pressure

Macular Research Unit

Dr Robyn H. Guymer, MB BS PhD FRANZCO, RVIB Research Fellow, Unit Head
Ms Melinda Cain, Senior Research Nurse, Senior Clinical Trial Co-ordinator, RN
Mr Anthony Carnicelli, BOrth, Research Assistant, Clinical Trial Co-ordinator

Dr Anthony Chiu, MB BS, Volunteer
 Mr Trung Dang, BOptom, Research Orthoptist
 Dr Claire Hooper, MB BS, Postgraduate student
 Ms Julie Kearney, RN, Research Nurse
 Dr Nick Mantel, MB BS FRANZCO,
 Retinal Fellow
 Dr Niro Narendran, BSc, MB BS, MRCOphth
 (UK), Postgraduate MD student (from
 October 2001)
 Ms Gabriella Tikellis, BSc Grad Dip (Epi &
 Biostat), Research Assistant



Macular Research Unit

*back row l-r: Ms Melinda Cain, Dr Robyn
 Guymer, Mr Anthony Carnicelli
 front row l-r: Dr Niro Narendran Mr Trung Dang,
 Ms Julie Kearney*

Melbourne Excimer Laser Group

Mr Terry Couper, BAppSc (Orth), MOAA,
 Unit Manager
 Ms Caroline Gibbs, BSc(Orth), Orthoptist
 Ms Ilona Probyn, Receptionist

Ocular Genetics Unit and McComas Family Laboratory

Dr Paul Baird, PhD, Research Fellow, Unit Head
 Ms Elissa Botterill, Summer student (from December 2001)
 Ms Diep Chiu, BSc, Research Assistant (from August 2001)
 Ms Elizabeth Guida, BSc (Hons), Lab Manager, Senior Research Assistant (from June 2001)
 Ms Robyn McNeil, BSc(Hons), Research Assistant, Laboratory Manager (to April 2001)
 Dr Niro Narendran, BSc, MB BS, MRCOphth, MD student (from October 2001)
 Ms Andrea Richardson, BSc (Hons), Research Assistant (from January 2001)
 Ms Margaret Shaw, Part-time undergraduate student (to September 2001)
 Mr Ye Chen, Summer student (to March 2001)
 Mr Danny Chin, Retinal Fellow (to March 2001)



*Professor Taylor farewells Mrs
 Bev Vaudrey after more than
 25 years' service in
 Administration*

Photography Unit

Mr Joss Dimock, BAppSc (Photography), Unit Head (to July 2001)
 Ms Joanna Ong, BAppSc (Photography), Unit Head (from August 2001)
 Ms Sarah Squire, BAppSc (Photography), Technical Assistant (from
 August 2001)

Administrative Staff

Ms Judith Carrigan, BSc(Hons) BA, Department Manager & Personal
 Assistant to Professor Taylor
 Mr Geoff Hudson, Administrative Assistant
 Ms Marnie Mackenzie, BBS, Finance & Personnel Assistant

Ms Tracey MacRae, Business Manager
 Mr Trevor Stone, Dip Info Tech, Cert
 Bus, Network Administrator
 Mrs Fulya Torun, Administrative Assistant
 (from November 2001)
 Mr Henry Tse, BSc, Network Manager
 (from September 2001)
 Mrs Bev Vaudrey, Administrative
 Assistant (to December 2001)
 Ms Fiona Warden, Administrative
 Assistant
 Mr Weiliang Zhang, BEc, Grad Dip Acct,
 MBA, CPA, Finance & Personnel
 Officer



*Administrative Staff (l-r)
 Mr Weiliang Zhang, Mrs Bev Vaudrey, Mr Trevor Stone,
 Mrs Fulya Torun, Ms Fiona Warden, Ms Judith Carrigan*

Senior Fellows

Dr Anne M.V. Brooks
 Dr William Campbell
 Dr Trevor Gin
 Dr Anthony Hall
 Dr Peter N. Henderson
 Dr Alan Isaacs
 Dr Alicia Jenkins
 Dr Lionel M. Kowal
 Dr Mark G. Lazarus
 Associate Professor David Mackey
 Associate Professor Cathy McCarty
 Associate Professor Justin O'Day
 Dr Sanduk Ruit
 Dr Richard J. Stawell
 Dr Robert H. West

Fellows

Dr Penelope Allen
 Dr Lawrence Carroll
 Dr Joan M. Cosgrove
 Mr Terry Couper
 Dr J.E. Craig
 Dr Mark Daniell
 Dr James Elder

Dr Kevin Foo
 Dr Wilson Heriot
 Dr Robert Hudson
 Dr David Kaufman
 Dr Mark McCombe
 Dr John D. McKenzie
 Dr Alan A. McNab
 Dr John Manolopoulos
 Ms Carley Nicholls
 Dr Salmaan Qureshi
 Dr Julian Sack
 Dr Laurence J. Sullivan
 Dr Christine Tangas
 Dr Faye Walker
 Dr David Workman

Clinical Fellows

Dr Ahmed Aftab (Retina)
 Dr Devinder Chauhan (Retina)
 Dr Rohan Essex (Cornea)
 Dr Fiona Irvine (OPAL)
 Dr Niral Karia (to July 2001) (Retina)
 Dr Rajiv Maini (to July 2001) (Cornea)
 Dr Nick Mantel (Retina)
 Dr Shivram Nadkarni (to June 2001) (Ocular Motility)
 Dr Shona Sutherland (Ocular Motility)
 Dr Visanee Tantisevi (Glaucoma)
 Dr Churairat Watchanamongkol (Cornea)

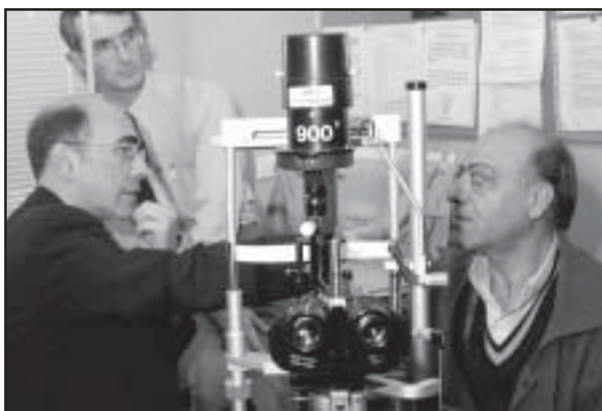


Teaching

There are three areas of focus for the Education and Training Unit: the annual teaching program, curriculum development, and research.

The vigorous annual teaching program includes medical students, eye registrars, and general practitioners. In addition to teaching by Associate Professor Hector Maclean and Dr Deb Colville, much of the training is also undertaken by various CERA and Departmental members.

In 2001 we were extremely lucky to have a week's visit from Professor Neil Miller, Professor of Neuro-Ophthalmology in the Wilmer Eye Institute of Johns Hopkins University, Baltimore. Professor Miller is a world leader in his field. A brilliant teacher, he is the author of the definitive textbook in neuro-ophthalmology. It was an invaluable opportunity to have him for a whole week at CERA during which he taught consultants and registrars. We were most grateful for his generosity and enthusiasm.



Professor Neil Miller examines a patient watched by Dr Alan McNabb

Ophthalmic curriculum development within the new University of Melbourne medical curriculum is being undertaken with the current focus being fourth year 'Problems of the Week' in teaching hospital Clinical Schools. CERA is included in the international

'GenderMed' network, whereby gender-inclusive curriculum development is being addressed at university medical schools in most Australian universities.

With the Royal Victorian Eye and Ear Hospital Clinical School of the University of Melbourne, a professional development program to enhance the roles of ophthalmologists as teachers was begun in 2001. An internet-accessible list of curriculum resources was compiled. A two-year program overview for eye registrars also was developed during 2001.

The CERA Education and Training Unit conducts research in four areas:

Medical student, eye registrar, GP education, and contextual issues in curriculum, including public health themes.

Medical Student: International Comparison

This project was an international comparison of Bristol and Melbourne Universities' undergraduate ophthalmology programs. Professor Andrew Dick of Bristol University, whose program sponsored English medical student Mr Sam Ward to spend a month at CERA and the Austin Repatriation Medical Centre Clinical School, collaborated and this work was successfully presented by Mr Ward and Mr Peerbux at the Royal Australian and New Zealand College of Ophthalmologists (RANZCO) bi-national meeting in Adelaide.

Eye Registrar Optics in Focus

Eye registrar curriculum development for the new RANZCO program was undertaken. The aim of this project was to prepare a student and tutor guide to the problem-based learning of optics. This work was presented at RANZCO and AOVS in 2001



*Associate Professor Hector Maclean (centre)
with a group of medical students*

and is being reviewed by the RANZCO educational community.

GP Impact Evaluation

The aim of this research was to evaluate a 'one-shot' teaching event for general practitioners by ophthalmologists-as-teachers. The validity of a knowledge questionnaire as an educational impact evaluation instrument was explored, and GPs were contacted following the workshop to identify altered practice as a result of the workshop.

Contextual Issues in Education Programs

Curriculum Reforms and Public Health: Using a thematic analysis of the RANZCO Curriculum Review discussions, the aim of this ongoing study is to analyse the role that public health themes play in the training and development of ophthalmologists.

2001 Postgraduate Studies

The Department of Ophthalmology offers postgraduate research degrees, including Doctor of Philosophy, Doctor of Medicine, Master of Medicine, Master of Surgery and Master of Science (Ophthalmology). The following students are currently enrolled.

Degrees Awarded

Doctor of Philosophy:

Ms Rakhi Dandona: 'Barriers to eye care services in the Indian state of Andhra Pradesh: Recommendations for action.'

Theses submitted

Doctor of Philosophy:

Ms Gabriella Tikellis: 'The role of Vitamin E in preventing the progression/incidence of Age-related Macular Degeneration.'

Master of Medicine (Ophthalmology):

Dr Andrew McAllan: 'The relative values of diagnostic criteria in glaucoma: Diagnostic criteria and glaucoma screening.'

Master of Science:

Mr Simon Barty: 'Relationship between risk factors and availability of eye services on the prevalence of cataracts in rural Victoria.'

Theses in Progress:

Doctor of Philosophy:

Dr Van Lansingh: 'Primary health care approach to trachoma control.'

Doctor of Medicine:

Dr Grant Snibson: 'The epidemiology and surgical management of pterygium.'

Advanced Medical Science

Mr Mohammad Arshad Peerbux: 'Needs analysis for medical student ophthalmology.'

Mr Stanley Tay: 'Low vision screening.'



Activities as a WHO Collaborating Centre



CERA was originally designated a World Health Organisation (WHO) Collaborating Centre for the Prevention of Blindness in 1992, a designation that has twice been renewed. It is the only such centre in Australia.

During 2001 CERA undertook a wide range of WHO related activities for the prevention of blindness. These are detailed in the Current Research Projects and Teaching sections of this Report.

The terms of reference of the Centre are:

- To participate actively in the development of activities for the prevention of blindness.
- To provide facilities for the training of personnel at different professional levels, especially from developing countries.
- To conduct applied field research on the epidemiology, management and operational aspects of avoidable blindness.
- To foster a multidisciplinary approach to the promotion of eye health and to the delivery of eye care, including rehabilitation, to all.
- To participate in the collection, elaboration and distribution of pertinent information.

CERA collaborates with other WHO Collaborating Centres throughout the world. These include centres at Juntendo University, Tokyo; the Institute of Ophthalmology, Beijing; International Centre for Eye Health, London; National Eye Institute, Maryland; Johns Hopkins University, Baltimore; Dr Rajendra Prasad Centre for Ophthalmic Sciences, New Delhi; and International Diabetes Institute, Melbourne.

Vision 2020: The Right to Sight

Established in 1999 by an alliance of WHO, International Agency for the Prevention of Blindness (IAPB) and International Non-Government Development Organisations (INGDO), the Vision 2020: The Right to Sight initiative aims to eliminate avoidable blindness by the year 2020.

This global initiative provided the momentum and impetus to develop a platform for Australian eye health professionals to work together. In October 2000, Vision 2020: The Right To Sight – Australia was launched by the Director-General of WHO, Dr Gro Brundtland, and the Honourable Dr Michael Wooldridge, Federal Minister for Health and Aged Care. This exciting initiative achieved very significant progress in its first year of operation.

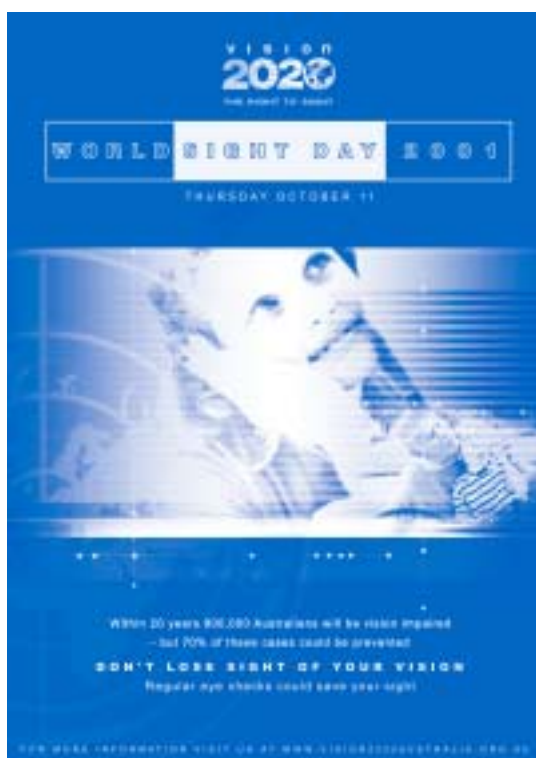
Its most critical achievement has been to bring together a diverse range of people and groups involved in various methods of preventing blindness and impaired vision and of promoting the rehabilitation of those permanently affected. Working together will provide gains that are greater than those that could be achieved by working individually.

The Right to Sight campaign is about eliminating avoidable blindness and preventing vision loss. Ensuring this message is heard is a tough battle. Blindness prevention, rehabilitation and vision care are not seen as topics in urgent need of support as they compete with many other more pressing and well-publicised health priority areas.

People take their sight for granted. Individuals and governmental organisations alike also take for granted that people are caring for their sight. The



Global Initiative for the Elimination of Blindness



Poster produced by the Eye Research Foundation, launched on World Sight Day, 11 October 2001, and distributed nationally by Vision 2020 Australia to promote awareness of the problem of global blindness

social well-being and quality of life of many hundreds of thousands of Australians and hundreds of millions globally are adversely affected by the lack of understanding and commitment to eliminate avoidable blindness and impaired vision.

Advocacy is a key role of *Vision 2020: The Right To Sight – Australia*. In our first year we directed most of our efforts to inform participants and collaborators about our goals and later to inform governments and corporations.

Three committees were established. The Australian Community Committee has made great progress and has become a cohesive and focused group. Committees for Aboriginal and Torres Strait Islander Issues and Global Issues have been established.

As Chairman for the Western Pacific Region of IAPB and as Chairman for the Committee of Advocacy, of the International Council of Ophthalmology, Professor Taylor attended the following meetings in 2001:

- IAPB Executive Committee and Task Force Joint Meeting, February 2001, Geneva
- Vision2020 – Australia, Appropriate Technology Workshop, February 2001, Adelaide
- IAPB SEA/WPR Bi-regional Meeting, March 2001, Taipei
- IAPB Executive Committee and Task Force Joint Meeting, July 2001, Buenos Aires
- IAPB Executive Committee, November 2001, New Orleans

Further information on Vision 2020: The Right to Sight – Australia may be obtained from: www.v2020australia.org/



CERA Research Award

Ms Jennifer Hassell, a member of the Eye Health Promotion Unit, was the recipient of the 2000 CERA Research Award. The citation for her award read:

Ms Jennifer Hassell's nomination for the 2000 CERA Research Award is for her work on the Impact of Vision Impairment Profile (IVI). Over the past 12 months she has been solely responsible for the recruiting of participants, and she conducted the majority of interviews. She has achieved the target number of participants and has been meticulous in ensuring that all data needed has been obtained.

She has made logical and thoughtful contributions to the development of the IVI from her own experience and from knowledge gained during the interviews she has conducted. She has participated in the analysis of data to establish the reliability and validity of the IVI.

Jennifer had her first paper as the first author published in *Clinical and Experimental Ophthalmology* in 2000. This paper was based on her presentations at ORIA in 1999 and ARVO in 2000. During the preparation of the paper and poster she worked diligently and made a polished oral presentation at ORIA. Jennifer was first author of a poster at ARVO in 2000, and contributing author in a 2001 ARVO abstract and the paper based on that. She has written a first author abstract for ORIA in 2000 and the paper is being prepared.

As a relatively new researcher, she has made a concerted effort to develop her research skills and is a valuable member of the CERA's Eye Health Promotion Unit research team.

Address given by Ms Jennifer Hassell at the presentation of her CERA Research Award on 24 July 2001.

I read a quote the other day– from Sandra Steingraber, the author of *Living Downstream: An Ecologist Looks at Cancer and the Environment*. She said 'from the right to know and the duty to inquire flows the obligation to act'.

I have seen a lot of this happen at CERA since I started working in the Eye Health Promotion Unit. I have seen results of research translated into programs that directly benefit the wider community and it is very rewarding to be a part of such work.

So it was a great honour for me to receive this award – but I believe it is also due in part to the quality of the research project and the help I have received.

I must acknowledge the support and encouragement given to me by my colleagues, especially Associate Professor Jill Keeffe and Dr LeAnn Weih, who not only made my work more interesting and enjoyable but also allowed me the opportunity to continue learning and questioning. And this is what's great about working in research.

I must also acknowledge the support given to me and to CERA that makes our research possible. Firstly the funding of projects is where it all begins and to believe in a project enough and then to fund it is the lifeline for research. Without financial support from Vic Health, the Department of Human Services, and the Lions Clubs Australia and the International Foundation to name but a few, our projects could not get off the ground. Thank you.



Working in the Eye Health Promotion Unit, I have learnt that any good research needs more than the dollar. The backbone of the project comes from the people involved and when research really succeeds it is because of the support given to you by people. The people who help you to find/tap into the population for the project – like the staff in the Royal Victorian Eye and Ear Hospital clinics, and at Vision Australia Foundation and the Royal Victorian Institute for the Blind centres. Then there are the people involved directly in my research – the people with a vision impairment.



Professor Graeme Ryan, Ms Jennifer Hassell, the Governor John Landy and Professor Hugh Taylor at the presentation of the CERA 2000 Research Award

Since starting at CERA, I have interviewed hundreds of people – from urban and rural communities with many varied cultural backgrounds – listening and learning about the impact vision impairment has had on their lives. I have been welcomed into self-help and support groups right around Victoria, where they are ever co-operative and interested in current research relating to vision.

I have also made friends who I can call on for their insight and advice. It is these people who have given me their time and details of their personal experiences of vision loss who make my research worthwhile and rewarding.

I have also been lucky enough to share our research with the broader community at national and international conferences.

So this is an award to all those people who have had some involvement in my research – and in accepting this I acknowledge all the contributors that it takes to make a research project work.



Current Research Projects

Clinical Research Unit

Head: Dr Bickol Mukesh

The Unit conducts research in three areas: health outcomes of surgical and medical treatment in ophthalmology and otolaryngology, clinical trials, and research training for the RVEEH Clinical Fellows.

The Unit also continues the analysis of five-year incidence study and the Visual Impairment Project (VIP).

Community Glaucoma Screening

Data from the Visual Impairment Project (VIP) suggest that one in ten people will develop glaucoma if they live long enough and only half of the people identified with glaucoma had previously been diagnosed with the disease. Therefore, it is necessary to develop screening strategies to identify people in the community with glaucoma so that they can be treated appropriately to prevent vision loss.

In November in collaboration with the Glaucoma Research Unit and the Eye Health Promotion Unit, the Clinical Research Unit conducted a community glaucoma screening study in Seymour, Victoria. This project aims to develop a new paradigm for community glaucoma screening using Frequency Doubled Perimetry and Heidelberg Scanning Laser

Tomography. All individuals aged 50 years and older living in the Seymour area were invited to participate, and 720 individuals were screened for glaucoma during the two-week period. Data from the study is currently being analysed. This project was funded by the Helen Schutt Trust. Dr Bickol Mukesh is the Principal Investigator in the study.

Progressive Visual Field Loss in Open Angle Glaucoma

The aim of this study was to quantify the progression of visual field loss in participants with open angle glaucoma. Currently, there are no published population-based studies on progressive visual field loss. To address this need, we have analysed visual field data from people with glaucoma who were identified in the

VIP, a population-based study of age-related eye diseases. Participants in this study included 108 people with glaucoma. These individuals were examined at two time points five years apart, which provides an opportunity to estimate the rate of progressive visual field loss over time. We have been assisted in this study by a visiting ophthalmologist from Malaysia, Dr Mimiwati Zahari who reviewed all records of participants with glaucoma and found that 50% of eyes with definite glaucoma showed deterioration of visual field loss. This project was conducted in collaboration with the Glaucoma Research Unit.



Dr Colville examining a patient as a part of the Community Glaucoma Screening Project in Seymour



Health Outcomes

Clinical outcomes following laser photocoagulation treatment for diabetic retinopathy at the RVEEH

In collaboration with Drs Alex Harper and Parapun Bamroongsuk, a retrospective review was undertaken for over 300 eyes that received initial laser treatment for diabetic retinopathy at the RVEEH between January 1997 and December 1998. The aim of this study was to determine visual acuity, retinopathy and maculopathy changes following laser treatment. The clinical outcomes reported in this study were similar to those reported in other studies.

Post-traumatic endophthalmitis

This study was undertaken in collaboration with Dr Rohan Essex. A retrospective review of 250 patients presented with ocular trauma at the RVEEH between January 1998 and December 2000 was conducted to identify risk factors in development of endophthalmitis. Statistical analysis is ongoing.

Refractive outcomes of cataract surgery - comparison of TOMEY and IOL MASTER in IOL calculation

This study was undertaken in collaboration with Ms Barbara Haynes and staff from the Orthoptic Department at the RVEEH. The one-year patient recruitment and data collection were completed. Statistical analysis is ongoing.

Steroid dose in sudden sensorineural hearing loss

This ongoing randomised double-blinded clinical trial aims to establish a rational basis for the dose of prednisolone prescribed in sudden sensorineural hearing loss.

Adenotonsillectomy and Rhinology surgery audits at the RVEEH

These audits were undertaken to evaluate current clinical standards in terms of peri-operative care and morbidity and to assess the feasibility for day case surgery.

Voice-related quality of life and tracheo-oesophageal speech

A quick retrospective review of 50 patients who underwent primary tracheo-oesophageal puncture (TEP) at the time their laryngectomy was conducted to evaluate voice related quality of life following surgery.

Clinical Trials

Clinical trials being conducted to evaluate new treatments for glaucoma are described in the section on the Glaucoma Research Unit. Other clinical trials include:

- A multicentre trial of Vitrase (Hyaluronidase) for ophthalmic intravitreal injection for clearance of

Staffing

The Unit was sad to farewell Dr Daniel McCarty. Following his move to the Marshfield Medical Research Foundation, US, in May, Dr Bickol Mukesh took over as Unit Head. The Unit also farewelled Dr Parapun Bamroongsuk and welcomed Mr Todd Robin, Dr Anhchuong Le and Dr Mimiwati Zahari.

severe vitreous haemorrhage (CroMedica). Dr William Campbell is the Principal Investigator.

- Prospective controlled randomised study of laser induced chorioretinal anastomosis for central retinal vein occlusion (CRVO). Dr Alex Harper is the Principal Investigator.
- Safety and efficacy of the STAAR Surgical Implantable Contact Lens™ (ICL™). Dr Ron Stasiuk is the Principal Investigator.
- A multicentre trial of Lumigan® compared with Latanoprost administered adjunctively with Timolol, in patients with glaucoma or ocular hypertension. (Allergan). Dr Nicolas Mantziros is the Principal Investigator.

Clinical Fellows Research Projects

The Clinical Fellows were involved in a number of studies in 2001. These may be summarised as follows:



Registrars and Clinical Fellows 2001 with Professor Hugh Taylor (far right)

Retinal Fellows (Drs Ahmed Aftab, Devinder Chauhan, Nick Mantel, Niral Karia)

- Natural history of Epiretinal Membranes in the VIP.
- Factors associated with the removal of scleral buckles.
- Intraocular tamponade duration and success of macular hole surgery.
- Accuracy of biometry – an example of how a complete audit loop improves medical practice.
- Causes of retinal detachment.
- Vitrase clinical trial.
- Central retinal vein bypass study: clinical trial.
- Intravitreal injections of EYE001 in patients with Exudative AMD: clinical trial.

Ocular Motility Fellows (Drs Shona Sutherland, Shivram Nadkarni)

- Muscle Pullie study.
- Binocularity in CSR patients.

Corneal Fellows (Drs Churairat Watchanamongkol, Rohan Essex, Rajiv Maini)

- Refractive error in the VIP.
- Mitomycin in CIN.
- Pellucid marginal corneal degeneration.
- Post traumatic endophthalmitis at RVEEH.
- Bacterial Keratitis and Corneal Perforation.

Glaucoma Fellow (Dr Visanee Tantisevi)

- Conducting clinical trials with the Glaucoma Unit.
- Late onset symptomatic glaucoma in neurofibromatosis.

OPAL Fellow (Dr Fiona Irvine)

- Ptosis (drooping of the upper eyelid due to muscle weakness) study.
- Case series of Moebius syndrome.
- Case series of cholesterol granuloma.

Corneal Research

LIONS EYE BANK – MELBOURNE

Associate Medical Director: Dr Grant Snibson

Head: Dr Graeme Pollock, Deputy Director

Despite periods during which the Eye Bank was without a co-ordinator, and the substantial training requirements for new staff, the Eye Bank distributed 277 corneas for transplant in 2001, a small increase over 2000 and one of our best ever results. However, this number of transplants only kept up with demand for 2001. It is expected that the employment of an additional co-ordinator will result in a further significant increase in donor numbers during 2002 and thus a reduction in waiting time for patients to receive sight-restoring corneal transplants.

In 2001 the Eye Bank continued to work closely with organ donation colleagues. Our work within hospital Intensive Care Units (described below) and our Multi-organ Donor Studies of 2000 continue to provide benefits. The percentage of multi-organ donors also being corneal donors reached a record 83%, easily the best result across Australasia. This association with organ donation colleagues provided the Eye Bank with 23% of its transplantable corneas during 2001.

The additional staff member will enrich the Eye Bank's research endeavours. One co-ordinator now has the prime responsibility for donation within a given work period, while the second is now able to devote relatively undisturbed time to donation education, promotion and sociological research projects. In particular the Eye Bank is interested in further developing its corneal audit tool within a number of hospitals, donor family feedback and some innovative education and promotion strategies. All of this is designed to further the evolution of the Eye Bank from simply a supplier of corneas for transplantation, to a modern and sophisticated donation service.



Mrs Prema Finn, Ms Melissa Goodman & Dr Graeme Pollock checking the clarity of a donated cornea

During the year, the Eye Bank's licence with the Therapeutic Goods Administration (TGA) was renewed. Licensing is based on a rigorous audit of the Eye Bank's Total Quality Management: quality control and quality assurance systems. We are proud that the Eye Bank passed this audit with flying colours. Our expertise in this area is also being extended across the Tasman; Dr Pollock spent a very successful week at the National Eye Bank of New Zealand during October assisting and consulting in the development of their Quality Systems.

Corneal Donation Audit Project

This study developed out of a smaller pilot project undertaken in 2000 and was fully implemented in 2001. It involves a comprehensive audit of the medical records of all patients dying within one of the major metropolitan teaching hospitals in Melbourne over a six-month period. Its purpose is to identify the potential donor pool in specific treating units and identify reasons for non-referral.

A unique computerised audit tool has been developed in-house that allows direct entry via a laptop computer during the process of reviewing the medical records. Those patients who would have



met eye donor criteria are also being cross-checked against the National Organ Donor Registry. Information will then be available on how well the demographics of those registered as organ and tissue donors match that of actual potential for organ and tissue donation.

Data collection and analysis continues into 2002 but preliminary results indicate that at least 50% of all patients dying in the hospital are medically suitable for corneal donation. In some units, such as the Intensive Care Units, this figure could be as high as 60%. At the completion of the study, best practice recommendations will be made and implemented and their impact on the donation rate will be assessed.

Intensive Care Unit Project

It is acknowledged that Intensive Care Units (ICUs) are now relatively aware and capable in both identifying potential organ donors and in dealing with the issues surrounding consent for organ donation. However, the potential for corneal donation by these units is yet to be fully realised. To address this, a donation program within an ICU was developed which recognised specific issues related to corneal donation. This program incorporates an audit/feedback tool to provide adjustments and refinements to the program.

We knew from our previous projects that within the organ donor population the interplay of age and sex of the donor, and the donor hospital, are important determinants of corneal consent rates.

However, the six-month results of the program were startling with 60% consent for corneal donation if the potential donor was male, but a 0% consent rate if the potential donor was female. Overall, 61% of all patients dying in the ICU were medically suitable for donation. A substantial increase in donor numbers from the Unit clearly demonstrated that a positive policy supported by a system of education, feedback, audit and Eye Bank responsiveness are important elements in realising the potential for corneal donation. However, it also identified some elements of consent that need to be considered. During 2002 this will be addressed through a designated requestor program currently being devised by the Eye Bank in collaboration with several ICUs. Unique in Australia, it will be managed chiefly by specifically trained nursing staff rather than the medical staff of previous programs.

PTERYGIUM



Supervisor: Dr Grant Snibson

Pterygium Studies

Two randomised prospective clinical trials were completed during the year. These studies, sponsored by Alcon Laboratories, were designed to evaluate a new angiostatic steroidal

agent (anecortave) in the prevention of recurrence following pterygium surgery and as a means of slowing the growth of primary pterygia. Ours was one of the most active of the many study sites involved in these large multicentre trials and one of

Staffing

This year saw some significant changes in personnel and the employment of an additional co-ordinator in response to the increased demands now placed on the Eye Bank. Mr Mark Lowe, the Eye Bank's transplant co-ordinator, departed in January after two and a half very productive years. Ms Melissa Goodman took up the co-ordinator's position in March and an additional co-ordinator, Mr Sean Mathews, was employed in May. Unfortunately Sean's stay with us was short lived and he departed in September. Mrs Prema Finn was employed in November as his replacement.

very few located outside the United States of America. Data analysis is continuing and it is expected that the findings will be published during 2002.

This year also saw the completion of a prospective clinical trial evaluating the efficacy and safety of amniotic membrane transplantation in the prevention of recurrence following pterygium excision. The results of this study have been presented at national scientific meetings and will be submitted for publication in early 2002.



Ms Caroline Gibbs, Mrs Ilona Probyn and Mr Terry Couper in front of an Orbscan videokeratography workstation

Artificial Cornea Research

During the year the Corneal Research Unit has commenced the evaluation of a new artificial cornea (keratoprosthesis) known as the AlphaCor. The device was developed in Western Australia and has a number of advantages over earlier keratoprostheses. The surgery is being offered to patients with blinding corneal disease who are not suitable for traditional corneal transplantation using human donor tissue. Along with centres in Perth, Sydney and Singapore, this research is being conducted as part of a NHMRC sponsored trial. The first two Victorian patients have now undergone this procedure and more than 40 patients have had the surgery worldwide. Questions regarding this project may be directed to Dr Grant Snibson and appropriate patients may be referred to the Corneal Unit at the Royal Victorian Eye & Ear Hospital.

Melbourne Excimer Laser Group

Manager: Mr Terry Couper

The Melbourne Excimer Laser Group, formerly known as Melbourne Excimer Laser Unit, was established in 1991. This partnership between private enterprise, CERA and the RVEEH has continued to explore the Excimer laser's role in refractive and therapeutic treatment. In 2001, the Group maintained its leading role in evaluating technology and providing the opportunity for teaching and research with visiting Corneal Fellows and registrars. The Group retains a Protocol and Ethics

Committee with Professor Taylor as Chair and scientific adviser. This Committee establishes guidelines for all attending surgeons and assesses research projects for the future. Emerging technologies such as wavefront guided lasers will be the priority for future evaluation. The Group's research is continuing to look at the role of Phototherapeutic Excimer laser in the treatment of painful bullous keratopathy and recurrent corneal erosion syndrome.

Epidemiology Research Unit

Head: Associate Professor Cathy McCarty (to July 2001)

Acting Head: Dr Liubov Robman (from July 2001)

Visual Impairment Project (VIP)

The research for this population-based study of the prevalence, incidence and causes of vision

impairment in Victoria, begun in 1991, was completed in 2000. During 2001, members of the Unit assisted the Eye Health Promotion Unit to translate the VIP findings into practical public health actions.

Vitamin E, Cataract and Age-related Maculopathy (VECAT) study

This study, a collaborative research project with Monash University's Department of Social and Preventive Medicine, was completed. The results, eagerly awaited as the first data to be presented internationally from clinical trials of antioxidants and age-related eye disease, concluded that Vitamin E was not found to be effective in preventing the onset or progression of either cataract or age-related maculopathy. Analyses were presented at ARVO.

Cardiovascular Health and Age-related Maculopathy (CHARM) study

This three-year study that commenced in 2000 with funding from the NHMRC, is a collaborative project with Professors Barry McGrath and John McNeil from Monash University. The aim of the project is to quantify risk factors for age-related maculopathy, the leading cause of blindness in Australia. Following protocol development in 2000, examinations commenced at the Ashley Ricketson Centre in Caulfield with the cases identified from the VIP. In April Dr Robyn Guymer became a Co-Chief Investigator in anticipation of Associate Professor McCarty's departure. Reliability studies for the carotid artery examination have been completed so the team is able to see the maximum number of



(l-r) Professor Hugh Taylor AC, Chancellor of the University of Melbourne Ms Fay Marles AM, Associate Professor Cathy McCarty, and Dr Rakhi Dandona after the award of Dr Dandona's PhD

participants per day. The baseline examinations for the 'cases' and the 'controls' were completed.

Andhra Pradesh Eye Disease Study (APEDS)

This population-based study of eye disease in the southern Indian state of Andhra Pradesh, conducted in collaboration with the LV Prasad Eye Institute in Hyderabad, commenced in 1995 and was completed in 2000. APEDS data indicated that the prevalence of blindness is 1.84%, nearly four times the rate found for Victoria in the VIP. Refractive error was found to be a major cause of vision impairment in both studies. Analysis of the data and the write-up of the baseline results were completed this year. With support from the Australia-India Council, Drs Lalit and Rakhi Dandona visited CERA in April.

Staffing

Ms Rakhi Dandona's PhD thesis was passed in March. Ms Cara Fu returned from maternity leave in March and resigned in April to take up a new position with VicRoads. Mrs Suzie Wright resigned in March to return to full-time study and works part-time as an administrative assistant in the Eye Health Promotion Unit. Mr Adam Dowrick and Mrs Caroline Nicolas (formerly Cretin) commenced as full-time research assistants on CHARM. Mr Simon Barty submitted his Masters thesis in April and Ms Gabriella Tikellis submitted her PhD thesis in July. The Unit was sad to farewell Associate Professor McCarty who resigned in July to take up a position at the Marshfield Medical Research Foundation, US.

Eye Health Promotion Unit

Head: Associate Professor Jill Keeffe

Vision Impairment and Low Vision

Burden of Eye Disease - Impact of Vision Impairment Profile

The Burden of Eye Disease in Victoria project continues the development of the Impact of Vision Impairment Profile (IVI), a questionnaire developed in the Unit to describe and measure the impact of vision impairment. This work, funded through grants from the Victorian Health Promotion Foundation, Vision Australia Foundation, and the Jack Brockhoff Foundation, aims to determine the factors associated with successful vision rehabilitation. To date, 238 people have been interviewed prior to receiving vision rehabilitation and 131 people have been followed up six months after rehabilitation.

The methodology paper that details the establishment of reliability and validity of the IVI has been accepted for publication.

Findings on the impact of vision impairment on mobility and related areas were presented at the first Regional Orientation and Mobility Conference in Adelaide in September. Considerable interest was generated. The Royal Society for the Blind, SA, will incorporate IVI into their service planning. A collaborative study between CERA and the Neurological Mobility Services at the Guide Dog Association of Victoria has commenced.

Evaluation of Rehabilitation Programs for People with Impaired Vision

Work to develop Handicap Adjusted Life Year (HALY) and Quality of Life Years (QALY) measures for use in cost effectiveness evaluation of rehabilitation programs commenced in June when the project received three years of funding from the ARC SPIRT grant program. Vision Australia Foundation is the industry partner for this new work. Development of the QALY instrument was started



Associate Professor Jill Keeffe handing over Low Vision equipment to the Lions Club of Suva (Fiji) as a part of the Lions Low Vision Initiative

and three focus groups have been conducted to gain insights into the values and preferences people with impaired vision place on participation in daily activities.

Lions Low Vision Initiative

The Lions Low Vision Initiative (LLVI), a two-year project, began in March. It seeks to ensure provision of effective low vision services to all Victorians who need them, irrespective of age, place of residence, cultural or linguistic background. It is anticipated that after this model of low vision care has been developed in Victoria, it could be applied internationally, in both developed and developing countries. To aid in this, a low vision project is being developed simultaneously in Fiji.

Results from the community awareness and education initiatives survey sent out in April have been collated and a final report detailing findings and recommendations completed.

Four focus groups have been conducted to investigate the barriers that impede people with low vision from accessing support services. To complement these findings, a survey is being undertaken with RVEEH and private clinic patients who are vision impaired. The survey investigates

self-perceived vision difficulties, duration of vision loss, satisfaction with vision and also issues of awareness of low vision services and referral to services.

'Low Vision Focus', a weekly radio segment on 3RPH Radio for the Print Handicapped, has been running since early August. This aims to heighten awareness of vision loss, the importance of referral to low vision services and the scope of those services.

A representative working group was formed to plan the establishment of the Lions Low Vision Resource Centre as a display and demonstration facility for the latest developments in technology to assist people who are vision impaired.

Diabetic Retinopathy

Victorian Retinopathy Screening Development Project (VRSDP)

The final report, compiled by CERA, provides recommendations based on findings from three Department of Human Services funded projects, published literature and past experience of CERA's retinopathy screening projects. Key areas for recommendations include screening processes, recruitment and recall, linkages within the health service system, health professional training, promotion and community awareness, sustainability and barriers to screening. Copies are available from the Department of Human Services (DHS) or can be viewed on the CERA website:

<http://cera.unimelb.edu.au>

Local Initiatives in Diabetic Retinopathy Screening

Five projects throughout Victoria have been funded by DHS, with CERA's role to provide professional and technical support. A Community Resource Guide to Screening for Diabetic Retinopathy is in preparation.

Development of Culturally Appropriate Recruitment Strategies for Screening for Diabetic Retinopathy

Ms Isabelle Henry at the RVEEH produced a comprehensive report of the project. Findings of the study will prove useful in planning health promotion and screening in the Turkish and Vietnamese communities. The North West Division of GPs is using the findings of the study in its work to improve rates of screening for diabetic retinopathy in the Turkish community.

Lions Eye Health Program - Australia (LEHP-Australia)

The LEHP Australia has moved into the second year of its three-year international funding. Work in Victoria, Tasmania, South Australia and the Northern Territory has concentrated on consolidating the partnerships and community activities initiated in 2000. Expansion of the program into New South Wales commenced in December with the first training seminar being held for the state and district co-ordinators. Negotiations continue with Western Australia and Queensland in anticipation of program implementation in those states in 2002. The outcomes of training and implementation of LEHP will be evaluated.

Invited presentations were held at district conventions in New South Wales, Tasmania and Victoria. These included two major presentations highlighting LEHP-Australia and the partnership with CERA. The annual national convention MD201 was held at Wollongong in May. A presentation to a forum of approximately 800

Staffing

The Unit was sad to farewell Ms Suzie Wright, who left in November after a long association with CERA, and Mr Anthony Carnicelli who transferred to the Macular Research Unit in September. New staff who joined us throughout the year are Ms Tamara Pollard and Mr John Simpson (March), Ms Jodi Oswald (June) and Ms Leanne Harris (August).

people was made by Associate Professor Jill Keefe, Lions Past District Governor Mr George Barnard and Dr Bob Coulthard.

Resource materials continue to be produced and distributed. The latest, with a print run of 7,000, outlines the aims of LEHP-Australia and the program details. A launch of the LEHP-Australia resource materials translated into Vietnamese was held with the Vietnamese Lions Club of Melbourne in Footscray. The quarterly newsletter *LEHPintoACTION* continues to be produced.

A Novo Nordisk award of \$2,000 was received for a joint initiative between the LEHP-Australia, RVEEH and CERA for a proposed diabetic retinopathy website.

Vision Screening of Older People



Mr Anthony Carnicelli screening the vision of a volunteer at an RSL conference

Training to use the vision screening kit has been completed, with many aged care facilities taking on the project, including the Royal District Nursing Service and the Home and Community Care team. The Whitehorse Division of General Practice has distributed kits to all its general practitioners.

Vision screening days have been conducted in senior citizens clubs, not only to detect those who require a full eye examination from either an optometrist or an ophthalmologist, but also to promote awareness among members about visual impairment in old age.

The final report of the project's findings and recommendations was completed in September. The findings confirmed the need for community-based screening. The vision screening test detected a significant number of people with impaired vision who were not under current care. The need for screening is being taken up with the Department of Health and Aged Care through Vision 2020.

Trachoma

Primary Health Approach for the Control of Trachoma in Aboriginal Communities in Central Australia

The final of eight visits was made to the Anangu Pitjantjatjara Lands in September by Dr Van Lansingh. Preliminary examination of the data indicated that prevalence is still unacceptably high in the two communities. The data are being further analysed but there appears to have been a differential effect from the intervention, as expected, with all components of the SAFE strategy reducing the rate of trachoma in children.

Glaucoma Research Unit

Head: Dr Julian Rait

The Glaucoma Research Unit's two main areas of research are clinical trials and the Glaucoma Inheritance Study. The area of clinical research is headed by Dr Julian Rait, who strives to develop and test new drug therapies for the treatment of glaucoma.

Clinical trials

The Unit, co-ordinated by Ms Danielle Healey, is currently involved in the running of numerous clinical trials for various drug companies:

1. International Multicentre Trial of Latanoprost (Xalatan) (Pharmacia) has been running for five years and was completed in August 2001.
2. Five-year post-marketing safety study of Latanoprost (Xalatan) compared to usual care (Pharmacia).
3. A trial of a prostaglandin drug (Alcon) has been running for two years with a further two years to completion.
4. A trial of an ocular hypotensive lipid (Allergan) has commenced and will be completed in December 2003.
5. A four-year trial of a neuro-protective agent (Allergan). Enrolment was commenced in July 2000.
6. For those with a high risk genetic disposition to glaucoma, Alcon tested a new topical medication. Completed May 2001.
7. A trial of a prostaglandin for chronic angle closure glaucoma has been commenced and will be completed in December 2003.
8. A five-year post-marketing safety study of Xalacom in patients with open angle glaucoma or ocular hypertension (Pharmacia) has been approved and will commence early 2002.

Other studies:

Computerised Decision Support System

Dr Julian Rait is the Principal Investigator on a project that aims to improve visual functioning and quality of life of people with open-angle glaucoma. This will be achieved by developing and implementing a computerised decision support system for the management of open-angle glaucoma based on best practice. Currently data is being collected retrospectively to determine patterns of

treatment (medical and surgical), health outcomes, health service utilisation, subjective symptoms and quality of life. A database incorporating internal consistence and range checks to minimise data entry errors is also being developed.

Glaucoma Screening Study

As mentioned earlier, the Glaucoma Research Unit and the Clinical Research Unit recently completed another glaucoma screening study in the rural city of Seymour, 100 km north of Melbourne. The new technologies of Frequency Doubled Perimetry (developed at the Australian National University) and Heidelberg Scanning Laser Tomography were used to screen the local population for disease. The results are being analysed and will likely be published during 2002.

Glaucoma Progression Study

During 2001, our visiting Research Fellow from Malaysia, Dr Mimiwati Zahari, completed an analysis of the effectiveness of various criteria for Glaucoma Progression as applied to data from the Melbourne Visual Impairment Project. The means to best detect progression of glaucomatous visual field loss is controversial and the analysis cast some light on this interesting subject. A manuscript of our results has been submitted for publication.

Glaucoma Inheritance Study (GIST)

This project aims to:

- Identify new glaucoma genes by linkage and association studies
- Establish the magnitude of the role of individual glaucoma genes and mutations
- Examine genotype-phenotype correlations
- Establish ethnic origins and role of founder effects

Staffing

The Unit welcomed Associate Professor David Mackey and Mr John Ferraro during 2001.



Associate Professor David Mackey studying slides of optic discs

- Investigate the natural history of different subgroups of hereditary glaucoma
- Evaluate the sensitivity and specificity of clinical examination and investigations compared to gene status
- Evaluate pre-symptomatic genetic testing
- Create a population, family and genetic database for investigation of new diagnostic & treatment modalities.

Macular Research Unit

Head: Dr Robyn Guymer

During 2001, RVIB Research Fellow Dr Robyn Guymer continued her quest to determine better treatment and prevention measures for age-related macular degeneration (AMD). To this end, her Unit worked with Dr Paul Baird and the McComas Family Laboratory to search for genes that may be involved in AMD or closely related dystrophies.

Macular degeneration database

The Unit has substantially increased its capacity to build on its database, its greatest asset, concentrating its efforts in four areas. First, the Unit now has a full-time nurse, Julie Kearney, devoted to collecting blood from Visual Impairment Project (VIP) participants. Once this task is completed, the Vitamin E, Cataract and Age-related Maculopathy study (VECAT) subjects will be approached to allow the maximum use of the large amount of clinical information available on these cohorts. Secondly, Melinda Cain and Anthony Carnicelli have begun to follow up the Unit's large families of AMD to ensure that they are as complete as possible. Thirdly, Dr Niro Narendran has taken the very valuable collection of early onset drusen families and will build up these families to enable her to screen this group for candidate genes, as well as to do linkage analysis to look for a chromosomal region that may provide interest for further work. Fourthly, Dr Anthony Chiu has been visiting residential retirement facilities to offer residents eye check examinations. The purpose is to identify people over the age of 70 years who have no signs of AMD. These people will form a super-control population for the Unit's genetic research.

These specific projects complement the ongoing recruitment of subjects for the AMD inheritance study by Melinda Cain in the RVEEH clinics and private rooms.

Clinical

EYETECH anti VEGF international multi-centred study

Anti-Vascular endothelial growth factor (VEGF) injected intravitreally into people with choroidal neovascularisation secondary to Age-related macular degeneration is the most recent investigative treatment for this condition. It is hoped that this drug will halt the growth of new blood vessels beneath the retina. The Unit's involvement in this large (60 centres) study run from the US has been



Dr Robyn Guymer examining the eyes of a volunteer

its first exposure to such a multi-national study. Those involved attended a training session in Sydney and were certified by various bodies in the US before they could take part. The Unit is the second site in the 'rest of the world' (outside the US) to start recruiting, and they randomised and treated their first patient in November 2001. The study involves six weekly injections of an anti-VEGF drug EYE001 into the eye for one to two years.

CHARM (Cardiovascular Health and Age-related Maculopathy)

The purpose of this study is to investigate whether the progression of age-related maculopathy is associated with the progression of cardiovascular disease (CVD). Participants with age-related maculopathy have been identified from our Visual Impairment Project (VIP) and Vitamin E in Cataract (VECAT) Study and are being recruited to participate in the CHARM (Cardiovascular Health & Age-Related Maculopathy) study.

In the first year of this grant, 2000, the Study Protocol was developed and eligible participants identified from the VIP and VECAT Study. During 2001 all eligible participants were recruited and examined. To investigate the relationship between risk factors for CVD and AMD and its progression, a cohort of age and gender matched controls selected from the same population-based database

have been recruited. Recruitment and enrolment are under way.

Prophylactic laser photocoagulation in patients with high risk age related maculopathy

The Drusen Laser Study (DLS)

This is a clinical trial into the effectiveness of early prophylactic laser photocoagulation in patients with high risk retinal changes of age-related maculopathy. Patients with high risk of severe visual loss were enrolled to participate in the treatment trial where half of them received 12 light laser burns to the macular. This has been shown in pilot studies to cause a significant disappearance of drusen in some people. What is not known is whether this reduction in drusen will lead to less risk of visual loss from the complications of AMD. This clinical trial aims to answer this question. It is conducted as part of an international study based at Moorfields Eye Hospital in London. We continue to review our recruits who have entered their final year of the study.

An interim analysis of the unilateral group has been performed and the bilateral group analysis will follow.

Preventing vision loss in age-related macular degeneration with statins: A randomised, controlled clinical trial

The primary aim of this study is to determine whether Pravastatin slows the progression of AMD. Until prevention and more effective treatments are available, intervention to slow the progression of AMD to the late, visually devastating stage is essential. We also propose to seize this unparalleled opportunity to utilise fully the recruits to study the cardiovascular effects of cholesterol lowering medication in individuals with 'normal' lipid levels in a collaboration with Associate Professor James Cameron from the Department of Vascular Sciences & Medicine, Dandenong Hospital. An initial grant

of \$70,000 was received from the Potter Foundation in late 2001 to allow the commencement of this study. Protocols have been developed and ethical approval gained for this trial. This trial brings together collaborations not only with the Department of Vascular Sciences & Medicine at Dandenong Hospital but also the College of Optometry through Associate Professor Vingrys and Professor Paul Mitchell at the University of Sydney.

***CARM Study (Cataract Surgery and ARM)
Does cataract surgery precipitate choroidal neovascular membranes in patients with AMD?***

Clinical fundus features that place a patient at high risk of developing choroidal neovascular membranes have been recognised. Small studies have suggested that eyes with such fundus features that undergo cataract surgery are at an increased risk of progressing to neovascular AMD compared to such eyes that do not undergo surgery. The situation of a patient with age-related changes requiring cataract surgery is very common in clinical practice. Therefore whether or not cataract surgery in some way increases the risk of neovascular AMD needs to be answered. This study is a prospective randomised study to investigate whether there is a link between cataract surgery and progression of

AMD to CNVM. The result of the study will guide clinicians when contemplating cataract surgery. Dr Claire Hooper, a post-graduate student in our Unit, is actively enrolling people throughout the RVEEH into this study. Surgery has been performed in the group assigned to immediate treatment.

Genetics of AMD

See report from the Ocular Genetics Unit and McComas Family Laboratory below.

Ocular Genetics Unit and McComas Family Laboratory

Head: Dr Paul Baird

The work of this Unit focuses on the genetic basis of two late onset eye diseases, glaucoma and age-related macular degeneration. The latter is performed in conjunction with the Macular Research Unit.

Genetic registry

A genetic registry for the study of eye disease has been established. Several thousand blood samples have now been collected from a number of sources including the epidemiological eye studies - the Melbourne Visual Impairment Project/CHARM and the Melbourne based Vitamin E and Cataract Study. We have also begun collecting individuals at an advanced stage of life with no signs of eye disease as 'super controls'. In addition, blood samples from the Blue Mountains Epidemiological Eye Study have been provided to us by Professor Paul Mitchell at the University of Sydney. DNA from all the above samples will be extracted and used in our genetic studies of eye disease.

Glaucoma

Haplotype analysis of the glutamine 368 STOP mutation of myocilin

In the largest glaucoma family in our collection (GTAS2), we noted that a third of affected

Staffing

Mr Anthony Carnicelli joined the Unit as research assistant to co-ordinate the Eyetech clinical trial and to work as an orthoptist on the Unit's other clinical trials. Ms Gabriella Tikellis joined the Unit as a research assistant to begin work on the Statin clinical trial. Dr Claire Hooper began her post-graduate studies on the CARM project under the supervision of Dr Guymer and Associate Professor Jill Keeffe. Dr Niro Narendran arrived from the UK to commence her MD into the genetics of AMD jointly supervised by Drs Guymer and Baird. Dr Anthony Chiu started work in the Unit on a volunteer basis, visiting retirement homes to collect 'super controls' who are people over the age of 70 with normal maculae.

glaucoma individuals in this family had a glutamine 368 STOP (Q368STOP) mutation in the myocilin gene. We studied a number of markers surrounding this gene on chromosome 1 to establish if the mutation arose once in the family or if the mutation had occurred as a number of separate events. We concluded that the mutation entered the family only once in an original ancestor. We extended our study to individuals in 14 other unrelated glaucoma families who presented with this mutation and had been identified through the Glaucoma Inheritance Study in Tasmania. In all cases it was found that the same region of the chromosome surrounding the myocilin gene was inherited. This implied that the same mutation was derived from a common ancestor who was probably European in origin. This finding provides important information regarding the genetics of this disease and will hopefully aid in our discovery of other disease genes for glaucoma.



Dr Paul Baird, Head of the Ocular Genetics Research Unit

Discovery of novel glaucoma genes

The identity of one gene (myocilin) is already known and mutations in this gene account for approximately 4% of all adult glaucoma. Other genes involved in the remaining 96% of glaucoma need to be identified. A collaboration was established with Dr A. Bureau at the University of California, Berkeley, USA, to perform genetic analysis on two of the larger glaucoma families (GTAS2 and GTAS6) using a statistical method called Markov Chain Monte Carlo analysis (MCMC). This method has been applied to the larger of the two families (GTAS2) and a second potential disease region identified. Further investigation of this region is currently underway and is the subject of a proposed NHMRC project grant submission.

Funding support for the above projects comes from an NHMRC project grant.

Age-related Macular Degeneration (AMD)

Human studies into AMD The RDS and ABCA4 genes

Our studies on genes involved in the causation of age-related macular degeneration (AMD) continued. Our previous work on the retinal degeneration slow gene (RDS) had excluded this gene as a candidate disease gene in AMD. However we identified the single nucleotide polymorphisms (SNP's) within the gene in order to undertake association studies.

Although no association with AMD was found there was some suggestion that SNP's in this gene may be associated with other retinal diseases and these observations are being pursued. Our analysis on another candidate gene (ABCA4) was completed in AMD and further statistical analysis is currently underway to interpret our findings.

Association of the common variants of apoE and AMD

The common polymorphic variants ($\epsilon 2$, $\epsilon 3$ and $\epsilon 4$) of the apoE gene have been found to be associated with several late-onset diseases including cardiovascular disease and Alzheimers disease. Some of the clinical features of these diseases are also shared with AMD. As a consequence we analysed the three common polymorphic variants of the apoE gene in 315 individuals with AMD and 135 controls (no AMD). Our analysis indicated a positive association of the apoE variants and disease. We are currently extending our analysis to learn more about this association and why it exists. This will hopefully provide clues as to some of the underlying genetic causes of AMD and is also the subject of a proposed NHMRC project grant.

Cholesterol lowering medications

The data collected through the VIP epidemiological eye study in Melbourne provides an extensive repository of risk factor information about AMD in the community. The positive association of the common variants of apoE with AMD together with its known role in the cholesterol pathway made us investigate the use of cholesterol lowering drugs and their role in AMD. In collaboration with Dr Cathy McCarty, we looked at progression of AMD with the use of these drugs. We were the first in the world to find that the use of these drugs led to a slowing in AMD disease progression. These findings were published in the *Medical Journal of Australia* and are now being followed up in a pilot clinical trial.

Other cholesterol pathway genes

A collaboration with Professor Dick Cotton at the Genomic Disorders Research Centre, St Vincent's Hospital, was established. This was to explore the use of other mutation detection techniques to screen candidate cholesterol pathway genes and explore their role in AMD. A summer student (Ms Elissa Botterill) helped to sort out some of the issues connected with using the mutation detection technique of denaturing high performance chromatography to analyse these genes. Further investigation into a number of candidate cholesterol genes is the subject of a proposed NHMRC grant.

Twin study into AMD

A collaboration with Professor John Hopper of the University of Melbourne has been initiated to collect and examine twins in AMD research. A flyer about this research was included in the biannual *Twins Newsletter* and it is envisaged that recruitment will begin in 2002.

Early Onset Drusen

A number of individuals has been identified in the community who present with retinal deposits

(drusen) that are normally found in the early stages of AMD. The main feature of these individuals is their earlier age of onset of presentation (typically under the age of 55 years) compared to that seen in early AMD (over the age of 60 years). We have identified a large family in Victoria that presents with these features and individuals from this family will be investigated to learn more about the underlying features of disease. Our MD student (Dr Niro Narendran) from the UK has begun to undertake these studies.

Mouse models of AMD

Analysis of mice with retinal abnormalities resulting from mutagenesis continued. We were able to breed a number of mice that had been identified with retinal changes that resembled those seen in AMD. Inheritance was confirmed in several different mouse lines indicating that this change was genetic in origin. This work was presented at the Fifth Annual Vision Research Meeting in Fort Lauderdale, Florida, USA, and accepted for publication in the journal *Vision Research*. Funding for this work came from the Ophthalmic Research Institute of Australia.

Staffing

Ms Andrea Richardson arrived in January from LaTrobe University to take up a research assistant position on the NHMRC glaucoma grant. Ms Robyn McNeil, the laboratory manager, left in April; her position was taken by Ms Elizabeth Guida from the Department of Otolaryngology, RVEEH. Ms Diep Chiu took up a research assistant position in August to work on AMD. In October ophthalmologist Dr Niro Narendran arrived from London to undertake an MD study on inherited drusen under the supervision of Drs Paul Baird and Robyn Guymer. In December Ms Elissa Botterill took up a joint summer studentship between the McComas Laboratory and the Genomic Disorders Research Centre at St Vincent's Hospital. Mr Ye Chen and Ms Margaret Shaw completed successful AMD studentships in the lab and returned to full-time university study in March and September respectively. Dr Danny Chiu, a Retinal Fellow, left to take up a Nuffield Fellowship at Oxford University.



Visitors to CERA and the Department in

- January** Professor Michael Easterbrook, Department of Ophthalmology, University of Toronto, Canada
- February** Dr Zuraidah Mustafi, WHO Fellow, Malaysia
Dr Michael Scavone, Pharmaceutical Society of Australia
Ms Tricia Wunsch, Tabcorp
- March** Ms Phoebe Cox, Senior Grants Manager, Lions Clubs International Foundation
Dr W. John Armitage, Director, United Kingdom Corneal Transplant Service Eye Bank
- April** Dr Lalit Dandona, Hyderabad, India
Dr David Mudd, National Health Service, UK
- May** Dr Don Anderson, Director Pharmacogenomics and Medical Genomics, Pharmacia Corporation, USA
Mr David Rath, General Manager, Alcon Australia
- June** Dr John Carnie, Department of Human Services
Dr Ross Bury, Department of Human Services
Professor Graeme Giles, Cancer Epidemiology Centre, Anti-Cancer Council of Victoria
Professor John Hopper, Centre for Genetic Epidemiology, School of Population Health, University of Melbourne
Professor Terry Nolan, Head, School of Population Health, University of Melbourne
Mr John Hartmann, Managing Director, Allergan Australia
- July** John Landy AC, MBE, Governor of Victoria
- August** Professor Neil Miller, Johns Hopkins University, Baltimore, USA
Ms Louise Moffatt, Manager, New Zealand National Eye Bank
Mr Jonathan Benyei, Chairman, Blood and Organ Donation Taskforce, Department of Health and Aged Care
- September** Mr Michael Lynch, Chief Executive Officer, Vision Australia Foundation
Ms Carley Nicholls, Executive Director, Vision 2020 Australia
Mr Joe Chakman, Optometrists Association of Australia
Mr Doug Kent, Chief Executive Officer, Royal Victorian Institute for the Blind
Dr Rob Moodie, Chief Executive Officer, Victorian Health Promotion Foundation



2001



- October** Mr Royce Abbey AO DCM
Assoc. Prof. Neil Boyce, Executive Director, Victorian Organ Donation Service
Dr Jenny Schram, Medical Education Unit, University of Cambridge
- November** Mr Warwick Kitt, Managing Director, Alcon Australia
Mr Michael Lynch, Chief Executive Officer, Vision Australia Foundation
Mr Malcolm Daubney, President, Vision Australia Foundation
and the Board of Vision Australia Foundation
- December** Mrs Lynne Landy, wife of the Governor of Victoria
Dr Eng-Yiat Yap, Singapore



(l-r) Professor Graeme Ryan, Mrs Aline Darke, Mrs Lynne Landy and Professor Hugh Taylor at the opening of the renovated CERA offices



2001 Conferences

During the year, members of CERA and the Department attended numerous conferences and meetings in Australia and overseas.

Overseas

- Prevention of Blindness Course, Chiang Mai, Thailand, January
- IAPB Executive Committee and Task Force Joint Meeting, Geneva, February
- Launch Vision 2020 Pakistan, Peshawar, February



*Patients outside a local
Ophthalmic clinic in
Peshawar, Pakistan*

- Asian Pacific Academy of Ophthalmology /IAPB Meeting, Taipei, March
- Alcon Research Institute Meeting, Fort Worth, Texas, USA, March
- Fifth Annual Vision Research Conference, Florida, USA, April
- WHO Trachoma Rapid Assessment Workshop, Hanoi, Vietnam, April
- Annual Meeting of the Association for Research in Vision and Ophthalmology, Florida, USA, May
- Friends of Fred Forum, Fred Hollows Foundation, Cha-Am, Thailand, May
- Asia Pacific Regional Low Vision Workshop, Hong Kong, May
- IAPB Executive Committee and Task Force Joint Meeting, Buenos Aires, July
- Australasian and New Zealand Association for Medical Education Meeting, Wellington, New Zealand, July
- Gender Perspective in Medicine, ERASMUS Universities Consortium, University of Uppsala, Sweden, August
- Symposium on Low Vision and Visual Rehabilitation, Kuala Lumpur, Malaysia, August
- Symposium on Visual Impairment – Laramara – 10 years reflecting the world, Sao Paulo, Brazil, September



- 55th Annual Congress of Japanese Clinical Ophthalmology, Kyoto, October
- WHO Elimination of Trachoma Meeting, Geneva, November
- American Academy of Ophthalmology Meeting, New Orleans, November
- 6th SightFirst Regional Course on Prevention of Blindness and Eye Care Management, Nakhonratchasima, Thailand, December
- Medical Women's International Association Meeting, Bellagio, Italy, December

Australia

- Genome Conference, Lorne, February
- University of Melbourne Deans and Heads Conference, Lorne, February
- Macular Vision Loss Support Society Meeting, Melbourne, February
- Vision2020 – Australia, Appropriate Technology Workshop, Adelaide, February
- Eye Bank Meeting, Adelaide, March
- Twins Research Symposium, Melbourne, April
- Australasian Transplant Co-ordinators Conference, Canberra, April
- Medical Women's International Association Meeting, Sydney, April
- Lions Clubs International Multiple District 201 Convention, Wollongong, May
- Research Investment and Commercialisation for Health Forum 2001, Melbourne, June
- Melbourne Ophthalmic Alumni Annual Scientific Meeting, Melbourne, June
- Australasian Gene Mapping Meeting, Cairns, July
- Australian Medical Students Association Annual Conference, Melbourne, July
- Australians Donate 3rd National Forum on Organ and Tissue Donation, New Parliament House, Canberra, August
- Cornea and External Diseases Congress, Brisbane, August
- 1st Australasian Orientation and Mobility Conference, Adelaide, October
- Australian Ophthalmic and Visual Science Meeting, Sydney, December



(l-r) Ms Karen Bradshaw, PDG David Welsh, Associate Professor Jill Keeffe, PDG George Barnard, Lion Ollie Lassen, DG Ron Skeen, DG Ken Bowden at the Lions Clubs International Multiple District 201 Convention held in Wollongong



Selected Abstracts from 2001

Vitamin E Supplementation and Age-Related Maculopathy

HR Taylor, G Tikellis, LD Robman, CA McCarty, JJ McNeil. 2001 Annual Meeting, Association for Research in Vision and Ophthalmology, Fort Lauderdale, Florida, USA, April-May.

Purpose: To determine whether Vitamin E (500IU per day) would affect the incidence or progression of age-related maculopathy (ARM).

Methods: In a prospective, randomised, placebo-controlled clinical trial, 1,193 volunteers were followed for four years. Standardised clinical and ophthalmic examinations were performed on entry and then annually. This included dilated slit-lamp examination of the macula and stereo-retinal photography using the Nidek 3-DX fundus camera. Macular changes were graded in photos according to the International classification system for age-related maculopathy and degeneration. Side-by-side grading was also performed on photos from the baseline and final visits to ascertain cases of incidence and progression and final outcome was scored as 'same', 'better', 'worse'.

Results: Average age at baseline was 65.7 years (range 55-80 years) with 56% being female. Randomisation produced comparable groups in baseline characteristics. Results of photograding are presented. At four years there were 64 people who had developed ARM, 34 (53%) received Vitamin E (no significant difference). Early ARM was present in 102 people at baseline. Worsening of early ARM determined by side-by-side photo grading occurred in 44 people; 25/44 (57%) received Vitamin E. There were 10 people who developed AMD; four (40%) received Vitamin E (not significantly different). However, multivariate logistic regression showed progression of early ARM was less likely to occur with Vitamin E treatment in left eyes, OR=0.81 (95% CI 0.68-0.96) or in the worst eye, OR=0.85 (95% CI 0.73-0.98) but was not significant for right eyes, OR=0.97 (95% CI 0.82-1.1).

Conclusions: Preliminary analysis shows little benefit from four years of Vitamin E supplementation although further analysis of the data is required.

VECAT study: The Effect of Vitamin E on the Progression of Lens Opacities (preliminary results).

LD Robman, CA McCarty, G Tikellis, SKM Garrett, K Ogden, JJ McNeil, HR Taylor. 2001 Annual Meeting, Association for Research in Vision and Ophthalmology, Fort Lauderdale, Florida, USA, April-May.

Purpose: To examine the effect of Vitamin E intake on the progression of lens opacities.

Methods: Vitamin E, Cataract and Age-Related Maculopathy (VECAT) study is a four-year prospective randomised controlled trial of Vitamin E (500 i.u. daily) versus placebo in a population of healthy volunteers aged 55-80 years at enrolment. 1,193 participants of the study were examined annually. Their eyes were assessed clinically with Wilmer grading of lens opacities and also using digital Scheimpflug and retroillumination photography of the lens. Lenses with nuclear and cortical lens opacities of Wilmer Grade 2 and greater were classified as cataractous. Standardised lens image analysis with the Nidek EAS-1000 software was applied to all the images. The results of the baseline and 48 months of follow up lens clinical and digital assessment were compared.

Results: The mean age of participants was 65.7 (SD=6.5), with 57 percent being females. The nuclear and cortical opacities were equally prevalent in both groups at baseline according to clinical and digital assessment, with the exception of clinical cortical cataract grading in the left eye, where the number of cataractous cases was significantly higher. 85 percent of the enrolled participants completed their 48 months follow-up examinations. There was no significant difference between two groups in four-year progression of either nuclear or cortical cataract. Also, there was no significant difference in proportion of cases of cataract extraction. No conclusion on the Vitamin E effect on the progression of the posterior subcapsular opacity could be drawn due to its low prevalence in the study sample.

Conclusions: Vitamin E intake does not alter the four-year progression of nuclear or cortical lens opacities.



Laser Photocoagulation Treatment for Diabetic Retinopathy at a Large Australian Ophthalmic Hospital: Clinical Outcomes

Q Yi, P Bamroongsuk, D McCarty, A Harper, B Mukesh. Australian Ophthalmic and Visual Science Meeting, Sydney, December 2001.

Aim: To evaluate clinical outcomes of diabetic retinopathy photocoagulation at Royal Victorian Eye and Ear Hospital (RVEEH).

Method: A retrospective medical record review of all cases who had initial laser treatment for diabetic retinopathy at RVEEH from January 1997 to December 1998.

Result: The study included 322 eyes from 203 patients. The mean age was 65.8 years (range 18-89) and mean duration of diabetes was 14.7 years (range 1-40). Pan retinal photocoagulation (PRP) was performed in 84 eyes with mean follow-up of 16.1 months (range 2-27). Visual acuity (VA) was improved in 25 eyes (30%), maintained the same in 27 eyes (32%) and decreased in 32 eyes (38%). Severe visual loss was found in four eyes (4.8%). Neovascularisation regressed in 55 eyes (65.5%). Focal treatment alone was performed in 238 eyes and 55.5% of these cases required repeated focal treatment for persistent clinical significant macular oedema. The mean length of follow-up time in focal treatment group was 18.7 months (range 5-33). VA was improved in 81 eyes (34%), maintained the same in 57 eyes (24%) and decreased in 100 eyes (42%). Moderate visual loss was found in 50 eyes (20.6%). Macular oedema improved in 218 eyes (91.6%) (42.9% after initial treatment and 48.7% after repeated treatment). Macular exudate improved in 48 eyes (20.2%) (6.7% after initial treatment and 13.5% after repeated treatment).

Conclusion: Outcomes from our study appeared to be in line with results from the current literature. Findings from these data would be useful for counselling patients with respect to their clinical outcomes.

Prevalence and associations of epiretinal membranes in the Melbourne Visual Impairment Project

DJ McCarty, BN Mukesh, IV Nayak, JJ Wang, P Mitchell, HR Taylor, CA McCarty.

2001 Annual Meeting, Association for Research in Vision and Ophthalmology, Fort Lauderdale, Florida, USA, April-May.

Purpose: To determine the prevalence and factors associated with epiretinal membranes in a random sample of the population aged 40 years and older in Victoria, Australia.

Methods: Detailed eye examinations, including retinal photographs, were conducted from 1992 to 1997 in 3,271 people (83% of the eligible) in Melbourne and 1,473 (92% of the eligible) in rural Victoria. Epiretinal membranes were identified from photograding and classified into an early form without retinal folds (termed cellophane macular reflex (CMR)) or a later stage with retinal folds (termed preretinal macular fibrosis (PMF)). People with both CMR and PMF were allocated to the PMF group. Epiretinal membranes were classified as secondary if they were related to past cataract surgery, retinal vascular disease and retinal detachment. If they were present in people without a secondary cause, they were considered idiopathic.

Results: Epiretinal membranes were observed in 253 of 4,313 participants (6.0%, 95% CI= 5.2-6.7%), bilaterally in 19%. Prevalence increased significantly by age group (0.5% for 40-49 yrs, 2.6% for 50-59 yrs, 9.4% for 60 to 69 yrs, 15.1% for 70-79 yrs, and 11.3% for 80+ yrs). Prevalence was not significantly different between gender or between right or left eyes. The overall age and gender standardised prevalence of CMR was 4.8% (95% CI= 4.0-5.6) and PMF was 1.7% (95% CI= 1.2-2.3). Idiopathic epiretinal membrane prevalence was 4.9% (95% CI= 4.2-5.7) and secondary epiretinal membrane prevalence was 16.3% (95% CI= 12.5-20.0) among those at risk. Age-adjusted associations (OR, 95% CI) with idiopathic CMR included hypertension (1.5, 1.1-2.1), diabetes (2.0, 1.1-3.7), age-related maculopathy (1.8, 1.2-2.7), hyperopia (1.7, 1.3-2.4) and cardiovascular disease (1.7, 1.1-2.6). Glaucoma (3.9, 1.6-9.5) was associated with idiopathic PMF.

Conclusions: Prevalence of epiretinal membranes was similar to that reported in other population-based studies. However, this study found more associations with idiopathic CMR and PMF than previously reported.

The Incidence of Central Retinal Vein Occlusion in Unilateral Pseudo Exfoliation of the Lens Capsule

WE Gillies, A Brooks. Australian Ophthalmic and Visual Science Meeting, Sydney, December 2001.

Purpose: In surveying an extensive group of patients with unilateral pseudo exfoliation of the lens capsule certain interesting points emerged. This reflected particularly on the incidence of central retinal vein occlusion in this condition and perhaps in glaucoma also.

Method: A total of 284 patients with unilateral pseudo exfoliation of the lens capsule were examined clinically after an ophthalmic and general history were taken.

Results: Mean intraocular pressure (IOP) was 30.9mm Hg in the affected and 18.1 mm Hg in the unaffected eye. There was a difference of about 0.2 in cup disc ratio between affected and unaffected eyes. In 34 patients there was an acute presentation with high IOP, corneal oedema and open angles, but only one patient presented with acute angle closure glaucoma, nor was shallow anterior chamber common. Central retinal vein occlusion occurred in 10 affected eyes but no unaffected eyes and always with a rise in IOP.

Conclusion: Though the process involved in producing pseudo exfoliation of the lens capsule may contribute to the precipitation of central retinal vein occlusion, these findings suggest the rise in IOP is the more important cause. This may also be so in other forms of glaucoma.

The In Vivo Effects of Fluoroquinolones on Rabbit Corneas

GA Pollock, DJ McCarty, PA McKelvie, JF White, PLT Mallari, HR Taylor. 2001 Annual Meeting, Association for Research in Vision and Ophthalmology, Fort Lauderdale, Florida, USA, April-May.

Purpose: The use of topical fluoroquinolones to treat microbial keratitis is associated with an increased incidence of corneal perforation compared to other standard treatments. We studied the effects of topical fluoroquinolones on corneal collagen and keratocyte function in intact rabbit corneas and corneas with an epithelial defect.

Methods: Studies consisted of one group of intact corneas and one group of corneas where a 6-mm epithelial defect was created with a surgical scrape. Within each group, eyes were randomly assigned to one of four topical medications [0.3% ciprofloxacin, 0.3% ofloxacin, fortified antibiotics (1.36% tobramycin, 5% cefazolin) or Tears Naturale™ (3mg/ml hypromellose, 1mg/ml dextran 70, 0.1mg/ml benzalkonium chloride)]. Two drops were instilled hourly for 48 hours and then two hourly for an additional 48 hours. At 96 hours the corneas were removed and processed for light microscopy, immunohistology for Collagen IV, V and VI, and apoptosis staining.

Results: In intact rabbit corneas there was no demonstrable difference between treatment groups. In corneas with an epithelial defect, both fluoroquinolones delayed epithelial healing when compared to fortified antibiotics or tears. Keratocyte loss was seen in all groups and greatest in the ofloxacin group. Median stromal thickness with keratocyte loss was: ofloxacin, 30%; ciprofloxacin, 10%; fortified antibiotics, 7.5%; tears, 15% (ofloxacin vs. tears, Mann-Whitney=16.0, p=0.09). Keratocyte loss did not correlate with the amount of demonstrable apoptosis. Collagens IV, V and VI showed no differences between treatments.

Conclusions: These results suggest that ofloxacin is potentially cytotoxic to corneal keratocytes. Such an effect could lead to the observed increased incidence of corneal perforation in microbial keratitis.

The Intensive Care Unit's Role in Corneal Donation

GA Pollock, W Silvester. 3rd National Forum on Organ and Tissue Donation. New Parliament House, Canberra, August, 2001.

Introduction: Recent data from the Victorian Organ Donation Project, and similar projects being conducted across Australia, indicate that Intensive Care Units are now relatively aware and capable in both identifying potential organ donors and in dealing with the issues surrounding consent for organ donation. However, the potential for corneal donation by these units is yet to be fully realised.

Objectives: We analysed the demographics of corneal donation from within the organ donor population to identify those factors that may influence corneal donation rates. In addition, we discuss a pilot donor program designed to increase corneal donation rates from *all* potential donors, not only those considered for organ donation.

Methods: Individual regions (State and NZ) eye donation rates within the organ donor population were examined. They were determined from the Australian and New Zealand Organ Donation Registry (ANZODR) for 1994-2000. Victorian Organ Donation data was further analysed for demographic trends including age and sex of donor and the donor hospital. A donation program within an ICU was developed which addresses specific issues related to corneal donation. This program incorporates an audit/feedback tool to provide adjustments and refinements to the program.

Results: Within the ANZ organ donor population the trends were: two regions maintained eye consent rates, one increased its rate and there was reduction in three regions. In Victoria corneal consent rates generally increased with donor age (100% donors >45 in 1999) but were gender specific across all decades of life. Hospital rates varied significantly (79% high, 45% low for hospitals with 10 or more donors over the period). The ICU corneal donor program produced five corneal donors over a period of one month. Further preliminary data from this program will be presented.

Conclusions: Within the organ donor population the interplay of age and sex of the donor, and the donor hospital, are important determinants of corneal consent rates. Positive policy supported by a system of education, feedback, audit and Eye Bank responsiveness are important elements in realising the potential for corneal donation within a hospital.

Recurrent Corneal Erosion Syndrome: Results of Retreatment with Phototherapeutic Keratectomy for Treatment Failures with Primary Phototherapeutic Keratectomy

R Maini, MS Loughnan. The Royal Victorian Eye and Ear Hospital Alumni 2001 Scientific Meeting, Melbourne, June.

Purpose: Phototherapeutic keratectomy with an excimer laser is a recognised and frequently used treatment for recurrent corneal erosion syndrome. The aim of this study was to determine the success of a repeat phototherapeutic keratectomy in patients with persistent macroerosions following initial treatment with phototherapeutic keratectomy.

Method: All patients were treated with a superficial therapeutic ablation profile with either a VISX, NIDEK or SUMMIT 193mm excimer laser. All patients were private patients of, and were treated for both their initial and retreatments by, MSL. Retrospective analysis of case records of all patients requiring retreatment was supplemented with telephone follow-up.

Results: Over a five-year period (October 1995 – October 2000) seventy-six eyes were treated for recurrent erosion syndrome with phototherapeutic keratectomy. All patients had documented macroerosions and had failed previous treatment with a lubricant at night. Eight eyes (11%) continued to have macroerosions after this initial treatment, all opted for retreatment with phototherapeutic keratectomy. Following retreatment none reported symptoms consistent with macroerosion. Six of eight (75%) are now symptom free, 2/8 (25%) have an occasional foreign body sensation relieved by lubricants. Follow-up ranged from 9-60 months, mean 25.5 months.

Conclusion: Retreatment with phototherapeutic keratectomy appears to be successful for patients with macroerosions complicating recurrent corneal erosion syndrome who have failed conservative management with ocular lubricants and a primary photokeratectomy.

Causes of Decreased Visual Acuity Over Five Years in the Melbourne Visual Impairment Project

PN Dimitrov, BN Mukesh, HR Taylor, CA McCarty. 2001 Annual Meeting, Association for Research in Vision and

Ophthalmology, Fort Lauderdale, Florida, USA, April-May.

Purpose: To describe the five-year incidence and causes of bilateral visual impairment in participants of the Melbourne Visual Impairment Project.

Methods: Cluster random sample of 3,271 participants aged 40 years and older were examined during 1992-94, followed by five-year incidence study. Participants underwent standardised interview and a detailed eye examination including assessment of distance and near visual acuity (VA) using logMAR charts, visual fields, intraocular pressure, ocular motility, ophthalmoscopy and photography of the lens and the fundus. Four levels of bilateral presenting visual impairment were defined: mild (<6/12-6/15), moderate (<6/15-6/60), severe (<6/60-3/60) and profound (<3/60).

Results: The crude five-year mortality rate was 7% and people with best corrected VA <6/12 at baseline were 2.3 times as likely to have died. Of the 3,040 people eligible to attend follow-up, 2,594 (85%) participated. VA data were available for 2,524 participants and 194 (7.7%) developed visual impairment or their VA decreased further.

Conclusions: Refractive error is the primary cause of people developing reduced VA in this population. Further efforts are needed to encourage people to have their vision tested regularly.

The Five-Year Incidence and Progression of Lens Opacities in the Melbourne Visual Impairment Project

CA McCarty, BN Mukesh, HR Taylor. 2001 Annual Meeting, Association for Research in Vision and Ophthalmology, Fort Lauderdale, Florida, USA, April-May.

Purpose: To describe the five-year incidence and progression of lens opacities and cataract surgery in a random sample of the Melbourne population aged 40 years and older.

Methods: Baseline examinations were conducted from 1992 to 1994 and follow-up examinations were conducted from 1997-1999. Cortical and posterior subcapsular (PSC) opacities were graded from retroillumination photographs and nuclear opacities were graded from slit lamp photographs. Cortical cataract was defined as greater than or equal to 4/16 opacity; progression was defined as greater than 2/16 increase. Nuclear cataract was defined as greater than or equal to Wilmer standard grade 2; progression was defined as greater than 0.5 increase. PSC cataract was defined as opacity greater than or equal to 1mm squared; progression was defined as greater than 1mm squared increase.

Results: At baseline 3,271 (83% of eligible) people were examined. The crude five-year mortality rate was 7% and people with presenting visual acuity <6/12 were 2.3 times as likely to have died. Of the 3,040 participants eligible to

attend follow-up examinations, 2,594 (85% of eligible) did participate. The mean age of participants at follow-up was 62.5 years and 55% were female. The percent of people who had at least one lens extracted in the intervening five years increased from 0.5% of people aged 40-49 at baseline to 34.3% of people aged 80+ at baseline. The incidence of cataract surgery did not vary by gender or other demographic factors. The overall incidence of the three types of cataract was: cortical 7.7% (95%CL=5.8, 9.5), nuclear 16.4% (95%CL=12.1, 20.8), and PSC 7% (95%CL=5.3, 8.7). The overall progression of the three types of cataract was cortical 14.3% (95%CL=10.2, 18.3), nuclear 19.3 (95%CL=15.9, 22.7), and PSC 20.0% (95%CL=8.7, 31.1). The incidence and progression rates increased significantly by age, but the rates were not significantly different by gender.

Conclusions: These data will be used to estimate the future need for cataract surgical services in Victoria.

Incidence of Open Angle Glaucoma: The Melbourne Visual Impairment Project

BN Mukesh, CA McCarty, JL Rait, HR Taylor. 2001 Annual Meeting, Association for Research in Vision and Ophthalmology, Fort Lauderdale, Florida, USA, April-May.

Purpose: To determine the incidence of open angle glaucoma (OAG) in Melbourne, Australia.

Methods: Cluster random sample of 3,271 participants (83% of eligible residents) aged 40 years or older. Baseline examinations were conducted during 1992-94 and follow-up data were collected from 1997-99. Each participant both at baseline and follow-up underwent a standardised ophthalmic examination including intraocular pressure, visual fields, cup disc ratios and paired stereo photographs of the optic disc. Glaucoma was assessed by a consensus group of six ophthalmologists that included two glaucoma specialists. Glaucoma was diagnosed as possible, probable or definite.

Results: The overall incidence of probable and definite OAG was 0.95% (95% CL= 0.60, 1.30) and any OAG was 2.57% (95% CL= 1.55, 3.59). The incidence of glaucoma increases significantly as age increases ($p < 0.001$). The incidence of probable and definite glaucoma increases from 0% of subjects aged 40 and 49 years to 5.5% of subjects aged 80 years and older. The incidence of any type of glaucoma increases from 0.3% of subjects aged 40 and 49 years to 11% of subjects aged 80 years and older. There was no relationship with gender.

Conclusions: The incidence of open angle glaucoma increases significantly with age. Glaucoma is a major cause of visual loss and will become more important as the population ages and the number of elderly people increases.

Impact of Vision Impairment on Mobility and Associations with Domains of Functioning

J Keeffe, L Weih, J Hassell. Australian Ophthalmic and Visual Science Meeting, Sydney, December 2001.

Purpose: To assess the impact of vision impairment on mobility and its consequences for restriction to participation in activities of daily living.

Method: The Impact of Vision Impairment (IVI) is a validated 32 item questionnaire for use with adults with impaired vision. Participants who had no previous support or rehabilitation rated their degree of difficulty on IVI items as 'hardly any or no difficulty', 'a little to a fair amount' or 'a lot or can't do the activities'. Interviews were conducted at the Royal Victorian Eye and Ear Hospital, Vision Australia Foundation and Royal Victorian Institute for the Blind.

Results: Mean age of the 214 participants was 76 years (19 to 98 years) and 65% were female. The most common cause of vision impairment was age-related macular degeneration (AMD) (50%), followed by glaucoma (15%) and diabetic retinopathy (14%). Fourteen percent had visual field loss with good central acuity, 30% had visual acuity $< 6/12-6/18$, 45% $< 6/18-6/60$, 11% $< 6/60$. The mean duration of vision loss was 7 years (< 1 to 84 years). Twenty-five percent reported that vision did not interfere with mobility, 54% a moderate degree, and 22% a great deal. Twenty-four percent of those with field loss, 52% of those with VA $< 6/12$, 64% with VA $< 6/18$, and 96% of those with VA $< 6/60$ reported a moderate to great deal of interference with mobility. Degree of interference with mobility was unrelated to co-morbidity and on average men reported higher average restriction to mobility. Increasing mobility restriction was strongly correlated with restriction to participation in social/consumer and household/personal care activities ($r=0.74$ and 0.72), particularly shopping ($r=0.64$) and meeting people ($r=0.59$). Controlling for age and visual acuity, increasing difficulty with mobility was associated with a 1.7 (1.1 to 2.8) increase in needing assistance with daily activities.

Conclusion: Most of these people with impaired vision reported difficulty on the mobility related items. Their difficulty with mobility was related to their restricted participation in desired social and consumer, household and personal care activities.

Reliability of the Impact of Vision Impairment Questionnaire

LM Weih, JB Hassell, JE Keeffe. 2001 Annual Meeting, Association for Research in Vision and Ophthalmology, Fort Lauderdale, Florida, USA, April-May.

Purpose: To assess the reliability of the Impact of Vision Impairment Questionnaire (IVI) over time and between different forms of administration.

Methods: The IVI instrument is a construct and criterion validated questionnaire consisting of 32 items that

evaluate the impact of vision impairment on a person's restriction to participation in daily activities on a scale of 'no difficulty' (0) to 'can't do because of vision' (5). The IVI was administered to people with vision impairment (VA <6/12 or visual field loss) who were patients at the Royal Victorian Eye and Ear Hospital or members of self-help groups. Test-retest reliability was assessed by administering the IVI one to two weeks apart by the same interviewer. Inter-rater reliability was assessed by administration of the IVI on one occasion and by self administration within two weeks.

Results: The mean age of the 74 study participants was 71 (SD 14) and 58% were female. Most had visual acuity <6/12 to 6/60 (49%), 30% had VA <6/60, and 21% had visual field loss with better acuity. The Guttman split half correlation between interviewers 0.94, and between test-retest questionnaires 0.94. The mean absolute difference in item scores ranged from 0.24 to 1 and 75% to 95% of the responses to the 32 items were within 0 to 1 step difference on each administration.

Conclusions: The IVI demonstrates acceptable reliability over a short period of time and yields consistent results between interviewers. The IVI can also be self administered with assurance that the results will be comparable to those which would have been obtained by a trained interviewer.

Prevalence and Hygiene Risk Factors for Trachoma in Aboriginal People

VC Lansingh, LM Weih, JE Keeffe, HR Taylor. 2001 Annual Meeting, Association for Research in Vision and Ophthalmology, Fort Lauderdale, Florida, USA, April-May.

Purpose: To obtain baseline prevalence data and investigate hygiene related risk factors for active trachoma prior to treatment in two communities in Central Australia.

Methods: All registered residents (648) of two Aboriginal communities were eligible. Over the course of 13 months, four visits were made; all residents present were examined for trachoma. Trachoma was graded using the World Health Organization simplified grading scheme. An active case of trachoma was defined by the presence of TF or TI in either eye. The facial hygiene status was determined by the presence of ocular or nasal discharge. A clean face was defined as having none or only one facial sign present. Nasal discharge was graded as clear, abundant or mucopurulent.

Results: The overall examination rate was 75% (486), refusal rate was <1%, the rest were not present in the communities at any of the four visits. The prevalence of active trachoma in children less than 10 years of age was 79%. Trachomatous scarring was present in 61% of people over 30 years of age. The prevalence of corneal opacity and trichiasis were both 5% in adults over the age of 50 years. Among children less than 10 years old, those observed with dirty faces were 2.2 (1.2, 4.1) times more likely to have active trachoma. There was a dose response

relationship between increasing degree of nasal discharge and active trachoma in children ($p=0.05$).

Conclusions: Trachoma remains hyper-endemic in these communities. The presence of a dirty face significantly increased the possibility of having active trachoma as did the severity of nasal discharge.

Vision Impairment in Driving

JE Keeffe, CA McCarty, C Jin, HR Taylor. 2001 Annual Meeting, Association for Research in Vision and Ophthalmology, Fort Lauderdale, Florida, USA, April-May.

Purpose: To examine the relationship between self-reported motor vehicle accidents and decisions to cease driving in Australian adults.

Methods: People who participated in the Melbourne Visual Impairment Project between 1992 and 1995 were contacted, interviewed and examined five years later. Participants who were aged 45 years and older had a standard ophthalmic examination including presenting and best-corrected visual acuities. Participants were asked if they had ever driven, were current drivers, and if not, the reasons for ceasing driving. Current drivers were asked to report accidents since the initial study and the reasons for them.

Results: Eighty-four percent (1,949/2,308) of participants reported ever having driven and of those 92% were currently driving. Twenty-eight percent of drivers limited their driving in adverse conditions and over half (57%) did so because of their vision. There was no significant difference in occurrence of accidents between those with normal and impaired vision ($p<0.01$). When compared to those with normal vision, more of those with impaired vision (<6/12) gave vision as the reason for stopping driving (38% versus 4.6%, $p<0.001$). Of current drivers, 2.6% had visual acuity lower than the legal limit to hold a driver's licence.

Conclusions: Whilst participants with impaired vision reported limiting their driving in adverse conditions and stopping driving due to vision, no relationship was found between accidents and impaired vision.

Hereditary Hyperferritinemia-Cataract Syndrome: Phenotypic and Molecular Characterisation in the First Four Australian Pedigrees

JE Craig, J McLeod, S Gumley, DA Mackey, G Wirth, J Elder, L Kowal, B Clark, M Kirkland. 33rd Annual Scientific Congress of the Royal Australian and New Zealand College of Ophthalmologists, Adelaide, October-November 2001.

Purpose: Detailed evaluation of four pedigrees with Hereditary Hyperferritinemia-Cataract Syndrome (HHCS)

which is a rare autosomal dominant syndrome in which excessive ferritin light chain expression leads to cataract formation.

Methods: Four pedigrees with HHCS have been evaluated in detail at the clinical and molecular level.

Results: Affected individuals had ferritin levels ranging from 1092-5996mg/L (15-300mg/L) with normal serum iron. The cataracts are distinctive (especially on retroillumination) with scattered axial and peripheral vacuoles and crystalline deposits in cortex and nucleus, which progress with age. Cataract surgery has typically been around the 5th decade but one sporadic affected child is being considered for surgery. DNA analysis of two pedigrees (now known to be related) identified the causative mutation as a single base substitution (+40 A to G) in the Iron Responsive Element (IRE) of the ferritin light chain gene on chromosome 19q13 leading to upregulated L-ferritin synthesis. DNA studies of a third pedigree revealed a novel mutation (+39 C to A). Another mutation (+32G to U) has been identified in the sporadic case.

Conclusion: Although a rare cause of cataract, HHCS should be considered in families with dominant inheritance, and also in sporadic cases of juvenile cataract with the typical appearance described. The identification of causative mutations in the IRE of ferritin light chain mRNA increases understanding of ferritin regulation at the translational level.

Leber's Hereditary Optic Neuropathy Triggered by Antiretroviral Therapy for HIV

J Luzhansky, JH Finger, PJ McCluskey, N Howell, AJ Hall, A Pierce, J Hoy, DA Mackey. The Royal Victorian Eye and Ear Hospital Alumni 2001 Scientific Meeting, Melbourne, June.

Purpose: To describe two cases of Leber's hereditary Optic Neuropathy (LHON) precipitated by antiretroviral treatment for human immunodeficiency virus infection (HIV).

Method: Two cases of LHON (from an expected four new cases a year throughout Australia) were identified in men on treatment for HIV.

Results: Both cases were on treatment with antiretroviral medications. Both patients carried the 14484 mtDNA mutation and were distantly related (7th cousins). Although both presented with sequential visual loss typical of LHON, the correct diagnosis was delayed in both cases, despite having second degree relatives affected by LHON.

Conclusion: Patients with a family history of LHON requiring antiretroviral treatment should be warned of the possible risks of visual loss. The underlying mechanism of antiretroviral side effects may help characterise the other trigger factors for LHON.

The Nance-Horan Syndrome Revisited – Syndromal and Non-Syndromal X-Linked Cataract

JE Craig, KP Flowers, G Wirth, I Russell-Eggit, M Stankovich, M Ring, MM Sale, DA Mackey. 33rd Annual Scientific Congress of the Royal Australian and New Zealand College of Ophthalmologists, Adelaide, October-November 2001.

Purpose: Nance-Horan Syndrome (NHS) is an X-linked disorder characterised in males by bilateral congenital cataract and dental abnormalities. Carrier females may present with milder sutural cataracts and dental abnormalities. Mental retardation may occur in affected males. The disease gene has been mapped to chromosome Xp22.

Methods: A database of South-Eastern Australian patients with congenital cataract was established to facilitate identification of cataract genes. Genealogy was obtained, DNA extracted and affected members were examined, and documented photographically. In pedigrees with X-linked inheritance linkage analysis is underway.

Results: Six probable X-linked pedigrees were identified. In some of these, cataract was present in spite of the lack of any features of NHS. However, two of the larger pedigrees had features of NHS. These two pedigrees were found to be related, and indeed part of the kindred initially described in 1974 by Horan and Billson. Further affected individuals have now been examined. Preliminary linkage studies in these X-linked pedigrees suggest linkage to the NHS locus on Xp22, in at least some pedigrees.

Conclusions: X-linked inheritance in cataract pedigrees is commoner than previously realised. Female carriers often display sutural cataracts of lesser severity than affected males. We have observed systemic features (dysmorphism, dental anomalies, mental retardation) consistent with NHS in some (but not all) pedigrees. It is uncertain at this time whether isolated X-linked cataract is allelic with the as yet unidentified NHS gene, or whether other X-linked cataract gene(s) segregate in our population.

Summary of Myocilin (GLC1A) Gene Analysis and Genotype Phenotype Correlations in Australian Patients with POAG

J Craig, PN Baird, DH Healey, JL Rait, MA Coote, PJ McCartney, L Rowe, JH Fingert, CM Green, EM Stone, R Cooper, DA Mackey. The Royal Victorian Eye and Ear Hospital Alumni 2001 Scientific Meeting, Melbourne, June.

Purpose: To provide a summary of myocilin / TIGR (GLC1A) gene analysis results in a large cohort of patients with POAG derived mainly from the Glaucoma Inheritance Study in Tasmania, but including other pedigrees

ascertained in mainland Australia. To investigate genotype / phenotype correlations with the commonest mutations.

Method: As part of the ongoing Glaucoma Inheritance Study in Tasmania, a comprehensive attempt has been made to ascertain all available patients with POAG (familial and sporadic) in the State of Tasmania. Cases selected for analysis from Victoria and other States have been enriched for POAG with a positive family history, or of earlier age of onset. Clinical information regarding age of onset, peak IOP, disc appearance and visual field analysis has been collected. In selected cases further investigation with stereo-disc photography, standardised 24-2 full threshold HVF and tomography has been performed. In all cases DNA has been obtained and mutation screening of the 3 exons of the myocilin gene has been performed by SSCP and sequencing.

Results: To date 12 mutations in the myocilin gene have been identified in Australian pedigrees. The commonest mutations in our population are the Gln368STOP mutation (total of 15 pedigrees) and the Thr377Met mutation (total of 4 pedigrees). The mean age of diagnosis for the Gln368STOP mutation was 52.4 ± 12.9 years with peak IOP of $28.44 \text{ mm Hg} \pm 4.7$. Of these patients 8/29 had undergone filtration surgery. For the Thr377Met mutation, the mean age of diagnosis was 41.2 ± 11.5 years with mean peak IOP of $31.7 \pm 9.9 \text{ mmHg}$. 13/23 of this group had undergone filtration surgery. We have recently ascertained a pedigree with severe JOAG (manifesting in the second decade) in whom a Pro370Leu mutation has been identified.

Conclusions: Results to date are consistent with those in other populations which suggest that myocilin mutations are present in 3-4% of patients with POAG. With the commoner mutations we have been able to observe genotype / phenotype correlations with some mutations associated with very severe phenotypes while the Gln368STOP mutation is associated with POAG indistinguishable from typical adult-onset glaucoma.

D 3-Month Comparison of Bimatoprost with Latanoprost in Patients with Elevated Intraocular Pressure

JL Rait. 33rd Annual Scientific Congress of the Royal Australian and New Zealand College of Ophthalmologists, Adelaide, October-November 2001.

Purpose: To evaluate the efficacy/safety of bimatoprost, compared with latanoprost in patients with glaucoma or ocular hypertension.

Methods: A 3-month, multicentre, randomised, investigator-masked, parallel-group trial. Patients received bimatoprost (0.03% (LUMIGAN; N=119) or latanoprost 0.005% (XALATAN; N=113) once-daily in the evening for 3 months. Visits were at prestudy, baseline (day 0), week 1, month 1, month 2 and month 3. The primary outcome measure was IOP at 8AM. Diurnal IOP measurements (8AM, 12 Noon, 4PM, 8PM) were taken at baseline and month 3 and analysed per protocol. Safety measures

included adverse events and eye examinations.

Results: Baseline IOP was 25.7 mm Hg in each treatment group at 8AM. During follow-up, mean IOP was lower in the bimatoprost group than in the latanoprost group at all timepoints. Superior efficacy of bimatoprost was evident in diurnal measurements: at month 3, mean IOP was significantly lower with bimatoprost than with latanoprost at 12 Noon and at 4 PM ($P < .040$). Low target pressures were achieved by a higher percentage of bimatoprost patients than latanoprost patients. Both bimatoprost and latanoprost were safe and well tolerated. Trace-to-mild conjunctival hyperemia was more frequent with bimatoprost, and headache was more frequent with latanoprost ($P < .026$).

Conclusions: Bimatoprost provides excellent diurnal IOP control. More patients reach low target pressures with bimatoprost than with latanoprost, suggesting that bimatoprost is more effective than latanoprost in patients with glaucoma or ocular hypertension.

Visual Field Progression in Open Angle Glaucoma: The Melbourne Visual Impairment Project (VIP)

JL Rait, M Zahari, BN Mukesh, CA McCarty, HR Taylor. 33rd Annual Scientific Congress of the Royal Australian and New Zealand College of Ophthalmologists, Adelaide, October-November 2001.

Purpose: To determine the progression of visual field loss in open angle glaucoma (OAG) participants from the Melbourne Visual Impairment Project (VIP).

Method: A cluster random sample of 3,271 participants aged 40 years or older participated in a baseline examination from 1992-1994. Each participant underwent intraocular pressure (IOP) measurement, visual field testing, and stereophotography of the optic disc. 108 were identified with OAG and were ranked as having definite, probable or possible glaucoma. 74 of these subjects were reassessed using three methods: the Advanced Glaucoma Intervention Study (AGIS) criteria, the modified Anderson criteria and the Blumenthal method. The subject would be considered to have visual field progression if at least one eye showed progression in one of the three methods of assessment.

Results: Fifty-one percent of subjects showed visual field progression with any one method. The Blumenthal criteria yielded the highest amount of progressive fields (37.2%), followed by the Modified Anderson method (35.6%) and the AGIS method (16.2%). The progression of visual fields by any method was associated with glaucoma status ($p=0.01$), 68.2% of the definite glaucoma progressed, followed by 57.1% of the probable and 25% of the possible glaucoma. Only 6 subjects (13%) were considered to have progressed by all three methods.

Conclusion: Visual field progression on open angle glaucoma is associated with severity of disease, whereby

the visual field is more likely to progress, the more definite the condition.

Cholesterol Lowering Medications Reduce the Risk of Age-related Maculopathy Progression

RH Guymer, CA McCarty, BN Mukesh, PN Baird, HR Taylor. The Royal Victorian Eye and Ear Hospital Alumni 2001 Scientific Meeting, Melbourne, June.

Purpose: Most treatments for age-related macular degeneration (AMD) are aimed at reducing visual loss once the complication of choroidal neovascularisation has occurred. There is very little to offer the patients in terms of prophylactic measures to reduce the progression of early disease. Recently the cholesterol lowering drugs known as statins have been shown to reduce the risk of developing dementia, a group of diseases in many ways similar to AMD. We therefore wished to investigate the possibility that cholesterol lowering drugs may slow the progression of age-related Maculopathy (ARM).

Method: The VIP population-based epidemiological study provided us with five-year follow-up on the recruited subjects all of whom had a thorough eye examination and fundus photographs as well as a detailed medical history including medication. We were able to analyse information from those subjects classified with AMR at baseline and then five years later. In so doing we determined ARM progression by documenting an increase in size of drusen, a well recognised risk factor for complications of AMD. We then correlated these findings with regard to whether or not the subjects were taking cholesterol lowering medication.

Results: Data was available on 580 patients who were diagnosed with ARM at baseline. The progression of maximum drusen size reveals a difference between the group using cholesterol lowering medication and those not on these drugs. Subjects on cholesterol lowering medication at baseline were nearly four times less likely to experience progression of their ARM than people not on cholesterol lowering medication (13% versus 3.6%, Fisher exact test = 0.11).

Conclusions: This is the first investigation of the relationship between use of cholesterol lowering medication and ARM. We found that subjects taking cholesterol lowering medication were less likely to have their ARM progress in terms of size of drusen, one of the risk factors predicting progression to neovascular complications. These preliminary data warrant further investigation as the use of cholesterol lowering medication may be a simple way to slow progression of disease whilst we await better treatments and a cure for AMD.

Does Cataract Surgery Cause Progression of Age Related Maculopathy (ARM) in High Risk Fundi?

C Hooper, N Karia, A Harper, D Workman, R Guymer. The Royal Victorian Eye and Ear Hospital Alumni 2001 Scientific Meeting, Melbourne, June.

Purpose: A recent study has reported a clear benefit, with respect to quality of life, from cataract surgery in the majority of patients with ARM. However, small retrospective series have suggested that cataract surgery may precipitate choroidal neovascular membranes (CNVM) in susceptible eyes. Our primary aim is to investigate whether there is a causal link between cataract surgery and progression of high risk ARM to CNVM.

Method: A prospective randomised control trial is due to commence at the RVEEH in June 2001. Potentially eligible patients will be identified from those attending the General Eye Clinics for consideration of cataract surgery. They will have fluorescein angiography and will be reviewed by the Medical Retina Unit to exclude the presence of CNVM and to confirm eligibility. Logmar visual acuity and Impact of Visual Impairment Profile (IVIP) score will also be noted. Eligible patients will be randomised to either have immediate cataract surgery or be observed for six months. After this time, repeat angiography, Logmar visual acuity and IVIP will be performed. The primary outcome measure, relative risk (RR) of progression from high risk ARM to CNVM in the treated eyes versus the natural history group, will then be determined. Subsidiary endpoints will be to compare the change in visual acuity and quality of life between the two groups.

Results: Recruitment will commence in June 2001. An average one year progression rate, from high risk ARM to CNVM, of 10% has been assumed. Given this figure, statistical tests predict that 200 subjects will be required to demonstrate a RR = 2. In order to achieve this target, co-operation from all members of the hospital community is essential. In particular, participation by all general consultants and registrars is crucial.

Conclusions: The effect, if any, of cataract surgery on the progression of ARM is both pertinent and controversial. This study will determine whether cataract surgery precipitates CNVM in patients with high risk ARM. The number of patients excluded on the basis of an already present CNVM detected solely on angiogram will also be valuable in determining whether fluorescein angiography should be routinely performed on all high risk ARM patients prior to surgery.

Analysis of the RDS Gene in AMD

E Guida, B Tomlin, RH Guymer, P Baird. Australian Ophthalmic and Visual Science Meeting, Sydney, December 2001.

Purpose: The aim of this study was to investigate whether genetic changes in the RDS gene play a role in the aetiology of AMD.

Method: 395 cases of AMD collected from retinal clinics at the Royal Victorian Eye and Ear Hospital, Melbourne and 149 controls derived from the Melbourne Visual Impairment Project (VIP) study were screened for alterations in the RDS gene. Genomic DNA was extracted from ~5-10mL of whole blood by the standard proteinase K-phenol-chloroform method. Screening of the three exon and promoter region of the RDS gene was undertaken by polymerase chain reaction (PCR) amplification followed by the mutation detection technique of single strand conformation polymorphism (SSCP).

Results: None of the 395 AMD cases screened by PCR/SSCP showed mutations in the RDS gene. However five single nucleotide polymorphisms (SNP's) were identified within this gene from the Australian population. No association could be found between these SNP's and disease.

Conclusion: No mutations could be identified in either the promoter or the coding region of the RDS gene. This implies that the RDS gene is unlikely to play a significant role in the aetiology of AMD. Analysis of SNP's from within this gene reinforces this finding. Dissecting out the genetic components involved in a complex disease like AMD is still some time off.

Do Single Nucleotide Polymorphisms (SNP's) in the Peripherin RDS gene play a role in AMD?

PN Baird, BM Tomlin, RM McNeil, LM Weih, CA McCarty, M Cain, RH Guymer. 2001 Annual Meeting, Association for Research in Vision and Ophthalmology, Fort Lauderdale, Florida, USA, April-May.

Purpose: The genetic mechanisms leading to AMD are difficult to study due to the lack of familial material. Analysis of candidate genes is currently a popular approach to unravelling the involvement of genes in disease. The peripherin RDS gene has previously been reported as being involved in inherited retinal diseases and therefore offers itself as a candidate gene in AMD. We therefore undertook a mutational analysis of this gene as well as an association study looking at the single nucleotide polymorphism (SNP) profile of a large cohort of AMD and control individuals. SNP's were analysed due to the recent suggestion that they may be important in influencing the probability of developing a complex disease.

Methods: DNA was extracted from 295 patients clinically diagnosed with AMD, including 67 sibling pairs, and from a control sample set of 151 age-matched unaffected individuals collected through the Visual Impairment Project in Melbourne. The RDS gene was PCR amplified using a series of overlapping primers. Samples were screened for variations within the RDS gene using Single stranded Conformation Polymorphism analysis and confirmed with the use of bi-directional sequencing.

Results: No mutations were identified in the RDS gene individuals with AMD. We identified only four of the eight previously described exonic SNP's within this gene in both AMD affected and controls. The SNP's identified were at positions Val106Val in exon 1 and Glu304Gln, Lys310Arg and Gly338Asp in exon 3. It was noted that the allelic frequency for these variants differed from the previously published data. There were no significant allelic differences in the first three SNP's between AMD patients and control individuals (although the 4th SNP is still under analysis).

Conclusions: Mutations in the RDS gene do not appear to play a role in AMD. SNP profiles are clearly dependent on the ethnic background of the subject population in a study. To date there is no evidence to suggest that there is an association between any of our identified SNP's within the RDS gene and AMD. The contribution that multiple SNP's may have on disease is still under analysis.

Genetic Analysis of a Family with Early Onset Drusen and Polycystic Kidney Disease

N Narendran, M Cain, P Baird, RH Guymer. Australian Ophthalmic and Visual Science Meeting, Sydney, December 2001.

Purpose: To phenotype and perform genetic linkage analysis on a large Victorian family who present with early onset drusen. The family have previously been investigated for a genetic locus for polycystic kidney disease.

Method: The family was initially identified as part of CERA's Age-related macular degeneration inheritance study (AMDIS). Subsequently over 100 family members have been identified and are willing to participate in our study. Two further field trips are planned. Case histories, fundus photographs and blood samples will be taken on all the individuals over the age of 10 years.

The fundus photographs will be graded using standard University of Wisconsin grading parameters by two assessors to identify or classify individuals with the disease. DNA extraction will be performed, followed by linkage analysis at CERA and at the Australian Genetic Research Facility. Control allele frequencies for this study will be obtained from previous study populations into Australian eye disease. Fine mapping followed by mutation deletion will potentially allow the disease gene to be identified.

Results: A five-generation family from Victoria has been identified who present with early onset drusen and where polycystic kidney disease has also been described. The age range of individuals in the family varies between 10-83 years. Two of the cases already examined at ages 56 and 65 have early onset drusen (first noted at the ages of 44 and 55 respectively) yet have retained normal vision; one individual diagnosed in her early 40s now has bilateral choroidal neovascular membranes with poor vision. All three have coincident polycystic kidney disease. The family has previously been investigated for polycystic kidney disease with a region on chromosome 4 being identified as a possible site of the responsible gene.

Conclusion: The characteristics of the drusen in this family are different to those found in other early onset drusen diseases where the genetic loci have already been identified (eg Malattia Leventinese). The genes involved in the disease processes in these early onset maculopathies may provide valuable insight into the more common disease of age-related macular degeneration which is a leading cause of blindness in the elderly population in the Western world.

Validity Framework for Evaluating Educational Impact

D Colville, P Higgins, G Hawthorne. Australian Ophthalmic and Visual Science Meeting, Sydney, December 2001.

Purpose: Short weekend or evening sessions taught by a guest ophthalmologist are a common form of continuing medical education for general practitioners in Australia. For instance, one module in the present RANZCO general practitioner education program is devoted to teaching corneal foreign body removal. There were more than 46,000 Medicare billings for the item for corneal foreign body in Australia in 1998, largely performed by general practitioners. The purpose of this study was to evaluate the impact of a CME session about corneal foreign body removal. This AOVS paper focuses on the validity framework for the study, of general relevance to eye-related educational evaluation.

Method: An expert panel of ophthalmologists contributed suggestions for learning objectives, and these were converted into a 9-item knowledge questionnaire. A one group pre-test post-test evaluation design was used to evaluate impact, with the major validity study focus being concurrent criterion validity between pre-post knowledge item scores against pre-post confidence scores. Seventy-four general practitioners participated in one of three workshops held in Victoria, Tasmania and Queensland.

Result: The impact of the workshop was:

1. an improvement in confidence in performing corneal foreign body procedures and
2. a trend towards a decrease in referral proportion.

Conclusion: Although complex, the impact of workshops for developing clinical competence can be investigated using evaluation research, even 'one-shot' teaching events.

Optics in Focus: Towards a Future FRANZCO Learners' Guide

P Hoffman, A Isaacs, D Colville. Australian Ophthalmic and Visual Science Meeting, Sydney, December 2001.

Purpose: The aim of this project was to explore one possible model for RANZCO curriculum development under the 2003 entry scheme. This AOVS paper reports the case of curriculum development related to an aspect of the optics curriculum. Present Part I FRANZCO teaching of 'basic' ophthalmic sciences occurs separately from ophthalmic trainee work. Teaching of clinical ophthalmic 'problem-solving' will occur early in training in the new RANZCO curriculum, first intake selection 2003.

Method: Dealing with the effects of a referral filter bias, where organic ophthalmic disease mixed with refractive symptoms is the rule, is a complex problem-solving task expected of the entry level ophthalmologist. A recent graduate of FRANZCO Part I, an ophthalmic educator and a content expert in optics converted some tutorial notes about optical principles and the optics of instruments into a short 'guide to ophthalmic problem-solving'. Student knowledge only of some VCE physics was assumed. This guide starts with a simple clinical problem and ends with explanations of physiological and optical mechanisms, a *conceptual reversal* (applicable to Problem-based learning curricula generally) of previous RANZCO curriculum syllabuses and guides to learning.

Result: Solving a clinical problem such as 'Why couldn't you give me better vision with those new glasses, doctor?' required the student to understand some clinical history and examination findings, as well as an outline of the principles of spectacle prescribing, the focimeter, illustrative ray diagrams etc. To solve the problem, the learner then draws on understandings of the optical and physiological mechanisms that explain the symptoms, signs, and investigative findings.

Conclusion: Identifying a set of key clinical 'problems' around which to order new curriculum guides is one of many challenges for ophthalmologist-educators. Other challenges are to decide what constitutes essential and 'elective' ophthalmic knowledge, what constitutes good ophthalmic practice, and how optical, physiological and anatomic principles underpinning such practice can best be passed on to new ophthalmologists.

2001 Research Grants

Clinical Research Unit	\$
RVEEH	391,724
Glaucoma Unit	
Alcon Laboratories	37,580
Allergan	143,158
Pharmacia & Upjohn	11,750
Eye Health Promotion Unit	
Vision Australia Foundation	122,801
Brockhoff Foundation	62,600
Christian Blind Mission International	47,000
Lions Clubs International Foundation	368,415
Department of Human Services	210,316
Victorian Health Promotion Foundation	73,100
Wagstaff Bequest	72,458
ARC	64,995
Macular Research Unit and Ocular Genetics Unit	
RVEEH Research Committee	7,119
John T Reid Charitable Trusts	50,000
Ian Potter Foundation	4,546
PDD Development	16,732
RVIB	106,061
Alcon	4,800
NHMRC	137,341
William Collier Bequest	10,000
Visudyne	23,877
University of Melbourne	1,868
Epidemiology Research Unit	
Brockhoff Foundation	45,000
NHMRC	291,476
Wagstaff Bequest	104,417
University of Melbourne	45,457
Perpetual Trustees (Edols Bequest)	33,224
Other Research	
Ansell Foundation	80,000
Ophthalmic Research Institute of Australia	75,205
IAPB	112,440



2001 Publications

Refereed Publications in Scientific Journals

1. Baird PN, Dickinson J, Craig JE, Mackey DA. The *Taa1* restriction enzyme provides a simple means to identify the Q368STOP mutation of the myocilin gene in primary open angle glaucoma. *Am J Ophthalmol* 2001;131:510-511.
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Professor Hugh Taylor with Dr Le Thuy Quynh, Institute of Ophthalmology, Hanoi, Vietnam, a Visiting Fellow in the Eye Health Promotion Unit

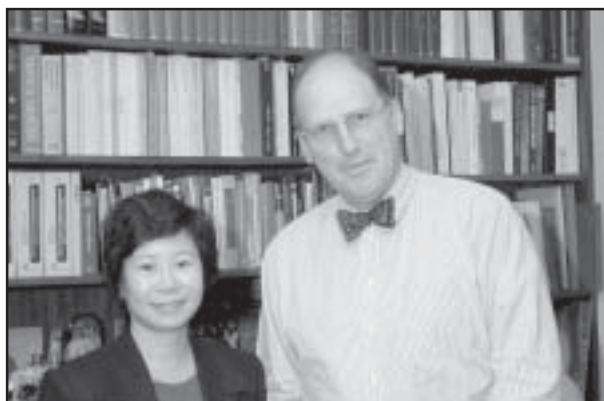


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A group of Eye Research Foundation benefactors being shown around CERA by Professor Hugh Taylor and Dr Dan McCarty

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Professor Hugh Taylor with Dr Dao Thi Lam Huong, Institute of Ophthalmology, Hanoi, Vietnam, a Visiting Fellow in the Eye Health Promotion Unit

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As a part of the Lions Low Vision Initiative, Mr John Simpson (r) interviews Mr Stephen Jolley on Radio Station 3RPH's 'Low Vision Focus'

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*“Peoplescape”
portrait of Professor
Hugh Taylor, created
by Scotch College
Year 5 boys and
exhibited in Canberra
as a part of the
Centenary of
Federation
celebrations*

Books

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Letters

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Editorials and Reviews

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Committee Authorship

85. OATSIH Indigenous Eye Health Committee. Diabetic Retinopathy, Cataract & Trachoma in Aboriginal and Torres Strait Islander Communities - Clinical Practice Guidelines. Canberra 2001.



Summer students working on AMD present their findings to the Macular Vision Loss Support Society who funded their work



CERA Collaborative Research Projects

Project

Collaborators

AMD

Randomised control trial of anti-VEGF injected intravitreally for CNVM

Eyetech Pharmaceuticals, New York.

Drusen laser study

Moorfields Eye Hospital, UK.

Cardiovascular Health and Age-Related Macular Degeneration (CHARM) Study

Department of Preventive Medicine, Monash University.

Andhra Pradesh Eye Disease Study

L.V. Prasad Eye Institute, Hyderabad, India.

Branch Retinal Vein Occlusion Study

University of Western Australia; University of Sydney.

Cataract Grading

State University of New York; Department of Preventive Medicine, Monash University; World Health Organisation, Johns Hopkins University; National Eye Institute.

Clinical Epidemiology of Genetic Renal-Eye Diseases

University of Melbourne, Department of Medicine, Austin Repatriation Medical Centre.

Clinical Practice Guidelines for Indigenous Health

Department of Health and Aged Care (DHS); Office for Aboriginal and Torres Strait Islander Health (OATSIH); Royal Australian & New Zealand College of Ophthalmologists (RANZCO); National Aboriginal Community Controlled Health Organisation; Fred Hollows Foundation.

Clinical Research Studies

Royal Victorian Eye and Ear Hospital (RVEEH); Alcon Laboratories; Allergan; Pharmacia & Upjohn.

Diabetes

Screening Programs

DHS; LaTrobe Community Health Service; South West Primary Care Partnership; Western District Health Service; Dandenong Division of General Practice; North West Melbourne Division of General Practice.

LEHP Australia

Lions Clubs International Foundation (LCIF); Glaucoma Australia; Diabetes Australia; Australian Diabetes Society Retinopathy Subcommittee.

AusDiab

International Diabetes Institute; DHS.



Project

Collaborators

Genetics

University of Tasmania; University of Iowa; Walter and Eliza Hall Institute of Medical Research; Genomic Disorders Research Centre, St Vincent's Hospital; University of California, Berkeley; University of Sydney Department of Ophthalmology, Westmead Hospital; Australian Twin Registry, University of Melbourne; Glaucoma Inheritance Study Tasmania (GIST); Marshfield Medical Research Foundation; Centre de Recherche du CHUL, Quebec, Canada.

Glaucoma Screening

Lions Clubs; Glaucoma Australia; Seymour District Memorial Hospital; Mitchell Community Health Service.

In Vitro Studies

University of Melbourne Department of Medicine, St Vincent's Hospital.

Koori Health

Victorian Aboriginal Community Controlled Health Organisation; DHS; OATSIH; VCO; RANZCO Victorian Branch; Optometrists Association of Australia.

Lions Eye Bank - Melbourne

Victorian Lions Foundation; RANZCO; RVEEH.

Lions Low Vision Initiative

LCIF; RVIB; Vision Australia Foundation; University of Melbourne Department of Optometry and Vision Science; LaTrobe University School of Orthoptics; Christian Blind Mission International (CBMI); World Blind Union.

Systematic Reviews

Australian System of Evaluation Research for New Investigative Procedures – Surgery.

Trachoma

Nganampa Health Council; CBMI; Health Habitat.

Undergraduate Curriculum Development

Monash University Faculty of Medicine.
Division of Ophthalmology, University of Bristol.

Vision Screening for Older People

RVEEH; Whitehorse City Council; Vision Australia Foundation.

Vitamin E and Cataract (VECAT) Study

Department of Preventive Medicine, Monash University.



The Eye Research Foundation

Executive Director's Report

The year under review proved to be a very productive period for the Eye Research Foundation. We recorded our largest ever surplus and with the support of the John T. Reid Charitable Trusts, we were able to contribute \$50,000 towards the cost of a clinical research assistant for CERA's Macular Research Unit.

Our Fundraising Committee conducted two successful Special Events, the Foundation welcomed several new Trustees and we vigorously expanded our donor database.

Along with most other not for profit agencies we have implemented significant changes as a result of the new Federal Privacy Act and the Victorian Fundraising Appeals Act, and implemented administrative measures that have greatly enhanced our efficiency.

The Eye Research Foundation is a mixture of proactive elements – Trustees, volunteers, staff and resources – and the catalytic nature of the Foundation will ensure that future years will see even more energy being devoted to our fundraising efforts.

Donors

During the year an additional 2,473 donors have chosen to support the Foundation. This is very encouraging but, as in the past, we have relied to an extent on the generosity of Victorian Ophthalmologists who wrote to their patients seeking support for the Eye Research Foundation.

The recently introduced Privacy Legislation will mean this avenue is no longer open to us, and we will implement more traditional methods of attracting new supporters. These may not be as cost efficient as our previous methods, however we have obtained a detailed profile of our database and will be applying statistical analysis techniques to give us every chance of success.

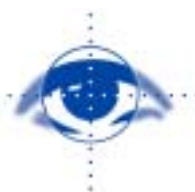
Special Events

This was quite a small section of my report last year but over the year Special Events have become a major part of our fundraising strategy.

Our Fundraising Committee, led for most of the year by Mr Peter Nankivell, organised two highly successful events. Early in the year was our inaugural dinner at 'Raheen', generously hosted by Jeanne and Richard Pratt. Our guests of honour were Cathy Freeman OAM and Jeff McNeill, both outstanding Australian athletes. The night was enjoyed by all, generously supported by guests and sponsors, and



(l-r) Mr Richard Pratt AC, Ms Cathy Freeman OAM, and Professor Hugh Taylor AC at 'Raheen'



raised in excess of \$47,000 for the Foundation.

Later in the year, a group of over two dozen friends of the ERF took to the streets to compete in the Melbourne Marathon. Participants included ophthalmologists, staff of the ERF and the Royal Victorian Eye and Ear Hospital, volunteers, Research Fellows and firefighters from the MFB. Special recognition is due to Assoc. Prof. Justin O'Day, his patients and his wife Sally (a Committee member) who between them raised over \$20,000. Special thanks also to Professor Taylor's wife, Assoc. Prof. Liz Dax AM (also a Committee member) who raised over \$5,000. In all, the Marathon sponsorship contributed \$46,000 to the Foundation.

Other Special Events included two donor functions to highlight the work of CERA. These were both very well attended and many thanks to our new Patron, John Landy AC MBE, Governor of Victoria, for his attendance at our Annual Report launch, and to the staff of CERA for their assistance with our tour of their research facilities.

Publicity

During the year Professor Taylor was presented with several national and international awards, not the least of which was being made a Companion in the General Division of the Order of Australia. Most of our publicity this year has been in response to these awards and we have had articles published in magazines as diverse as *The Australian Way*, QANTAS' inflight magazine, and *Great Scot*, the Scotch College Magazine.

Professor Taylor also presented two talks on ABC Radio National's 'Ockham's Razor'. (<http://www.abc.net.au/rn/science/ockham/stories/s321025.htm>)

During the year, Channel Nine's medical reporter, Ms Belinda Byrne, joined the Foundation as a Trustee and together we have developed some strategies to increase the publicity for the Foundation. These include the production of a new community service announcement (CSA) for TV, and reworking the 'Don't Fry Your Eyes' CSA that won several awards at the Cannes International Advertising Festival.

Cause-Related Marketing



As foreshadowed in my last report, we have been actively working to develop partnerships with commercial organisations that will be of benefit to the Foundation, and such a partnership has been formed with Sunglass Hut International (SHI).

A USA based retailer of sunglasses and watches, SHI holds over 40% of the sunglass retail market in Australia and is the dominant company in this area. Since early 2001, all SHI retail catalogues have featured the ERF logo, an eye health message, and a promotional message giving our 1300 737 757 number and our web address (www.erf.org.au). The four catalogues have been distributed to over two million households during the year.

Governance

During the year I have greatly appreciated the skilled advice and guidance provided by the Trustees of the Foundation. This level of advice has been enhanced by the addition of several new Trustees during 2001.

Professor Graeme Ryan AC joined us in January in his capacity as Chairman of CERA. Professor Ryan's contribution to public welfare as Dean of the Faculty of Medicine, Dentistry and Health Sciences at the University of Melbourne and as Chairman of the RVEEH is well documented and he adds enormous depth to our Board.

Mrs Margaret Ross AM joined us in April and she has an outstanding record of community work through her involvement at Board level with organisations such as the Baker Medical Research Institute, the Australian War Memorial Foundation, Fintona Girls' School and the John T. Reid Charitable Trusts. Mrs Ross takes a very active role in the Foundation and her experience in governance and fundraising has proved invaluable.

In June we welcomed Ms Belinda Byrne as a Trustee. Ms Byrne has taken a proactive role in promoting health and medical research in the Victorian community through her position as medical reporter for Channel Nine. She has in-depth knowledge of the health system and a wealth of contacts within that system and in the media. In December, Belinda was presented with the Victorian Government's Celebration of Ability Award for Media.

In September the Eye Research Foundation was further strengthened by the appointment of long-serving members of the Ansell Ophthalmology Foundation, Professor Emeritus Gerard Crock AO, Professor Derek Denton and Mr Charles Macek. The outstanding contribution of these three gentlemen to the Ansell Foundation is well known to those of us with an interest in eye research.

I am indeed fortunate to have the support and assistance of such an experienced and generous Board and I offer my thanks in particular to our Chairman, Mrs Diana Jones AM, who has been a great strength to me through her decisiveness, accessibility and guidance.

Volunteers

An organisation such as ours would simply not exist in its current form without the support of our volunteers and their input throughout the year has, yet again, been invaluable.

During the year our longest serving volunteer, Sister Elizabeth Lloyd, retired and to her I extend our sincere thanks for her tireless work. Sister Elizabeth has been with the Foundation since its inception and she has on several occasions been responsible for showing the new 'boss' the ropes!

Mrs Maureen Moore and Mr Jude Sebastian now share much of the administrative work of the Foundation and my colleague Elizabeth Douglas and I would like to place on record our thanks for their efforts and, perhaps more importantly, their companionship.

ERF Fundraising Committee

Another group of volunteers we are indebted to is our Fundraising Committee. I have already discussed the Herculean tasks they have completed – on time and on budget!

- Mrs Meredith Bunn
- Mrs Eileen Clark
- Mr Bill Dawson
- Assoc. Prof. Elizabeth Dax AM
- Commander Tony Murphy AFSM
- Mr Peter Nankivell (Chair)
- Mrs Sally O'Day
- Mr Andrew Skinner
- Professor Hugh Taylor AC
- Mrs Myriam Wylie

Staff

As 2001 was my first full year at the Foundation, I owe much to those who have assisted with my ongoing 'orientation'. Foremost is Elizabeth Douglas, our Bequests Manager, who made me feel at home immediately and who has accepted with remarkably good grace my disdain for filing and most things routine.

Elizabeth has been responsible for the implementation of many of the new projects that have happened over the year including our new bequest brochure, a series of five eye disease brochures and our donor tours – to name a few. Fortunately her attention to detail is complete and the quality of our publications and communications is testament to this.

I would again like to place on record my appreciation for the assistance provided the Foundation by CERA academic and general staff. Staff members of our 'big brother' regularly make their time available to the Foundation for our donor events and for day-to-day administrative duties.

Future Developments

During the year we have attempted to consolidate our core fundraising activities while introducing some new Special Events that had a strong chance of success. This focus on core activities will continue in 2002 – but with a renewed emphasis placed on generating publicity for the Foundation's activities.

To this end we have strengthened our external 'contactability' through establishing:

- Web site: www.erf.org.au
- National hotline: 1300 737 757
- Locked Bag 373 East Melbourne VIC 8002
- New ERF logo
- Corporate stationery



A new series of brochures on eye disease produced by the ERF

We have replaced ageing computer equipment, networked our fundraising software and installed on all workstations a program for Australia Post bar-coding and address verification. These initiatives will greatly lower our costs in the future.

You can expect to see a lot more of the Eye Research Foundation through various media as we rework past campaigns and take advantage of the expertise of Ms Belinda Byrne.

We will continue actively to recruit new donors through direct mail and increasingly encourage people to donate through our 1300 number and revamped web site.

Special Events again will be a feature of our fundraising and a significant increase has been included in the budget for this area.

These are very competitive times in fundraising but I believe the Eye Research Foundation has a considerable competitive edge over other organisations due to the unique mix of talent, experience and capacity that lies within our Board, Committee, volunteers and staff.

Next year promises to be a challenging but ultimately very successful one for the Foundation.

Greg Romanes
Executive Director

Centre for Eye Research Australia Limited

Abridged Financial Statements for Year Ended 31 December 2001

INCOME & EXPENDITURE	2001	2000
	\$	\$
Federal Government	428,816	362,165
State Government	277,416	65,380
Charitable Income	1,805,546	1,557,661
	2,511,778	1,985,206
Less: Expenditure	2,508,635	1,883,375
SURPLUS (DEFICIT) FOR THE YEAR	3,143	101,831
Accumulated Surplus at 1 January 2001	115,388	13,557
Accumulated Surplus at 31 December 2001	118,531	115,388
 BALANCE SHEET		
Current Assets	911,469	275,114
Non Current Assets	132,495	35,920
TOTAL ASSETS	1,043,964	311,034
CURRENT LIABILITIES		
Provisions	67,046	4,617
Accounts payable	113,110	5,000
Income received in advance	323,598	186,029
Interest bearing liabilities	421,679	-
	925,433	195,646
NON-CURRENT LIABILITIES	-	-
TOTAL NON-CURRENT LIABILITIES	-	-
TOTAL LIABILITIES	925,433	195,646
NET ASSETS	118,531	115,388
TOTAL EQUITY	118,531	115,388

Eye Research Foundation

Abridged Financial Statements for Year Ended 31 December 2001

INCOME & EXPENDITURE	2001	2000
	\$	\$
Operating Revenue	315,907	226,538
Less: Expenditure	314,045	247,799
OPERATING SURPLUS (DEFICIT)	1,862	(21,261)
Accumulated Surplus at 1 January 2001	203,253	224,514
Accumulated Surplus at 31 December 2001	205,115	203,253
BALANCE SHEET		
Current Assets	212,808	203,052
Non Current Assets	5,731	212
	218,539	203,264
CURRENT LIABILITIES		
Accounts Payable	0	11
Interest bearing liabilities	13,424	0
CURRENT LIABILITIES	13,424	11
NET ASSETS	205,115	203,253
FUNDS & RESERVES	205,115	203,253



Further Information

Donor Enquiries

Individuals and organisations interested in financially supporting the ERF or needing to advise a change of address, should contact the Executive Director on (03) 9929 8425.

Research Tours

Those interested in attending a tour of CERA's research facilities are most welcome and should contact the Executive Director on (03) 9929 8425.

CERA and ERF Publications

The Annual Report is the main source of information for our supporters. Supplementing this publication is a free newsletter, *Vision*, published twice a year, which outlines recent developments at CERA. Contact the Executive Director on (03) 9929 8425 to be included on the *Vision* Newsletter or Annual Report mailing list, or to notify a change of address.

Volunteers

ERF is always seeking people to assist with its work. If interested in helping, please contact the Executive Director on (03) 9929 8425.

Bequests

CERA has been able to establish and continue its research thanks to the people who have remembered the organisation in their Will. For further information about how to make a bequest, please contact the Bequests Manager on (03) 9929 8424.

Intending benefactors should be assured that all discussions are held in strictest confidence and that there is no sense of obligation to proceed after making an enquiry.

Advice that the ERF is a beneficiary in your Will would be greatly appreciated. Such notification is not binding in any way. You will be under no obligation to follow a particular course of action, and will be at liberty to change your Will at any time in the future.

Why Make a Will

Making a Will ensures that your estate is distributed according to your wishes. After considering the needs of your family and friends, do think about making a gift in your Will to assist our research. Your gift, no matter what the amount, will help to support our efforts to find better treatments for eye disease. We strongly recommend that you seek the professional advice of a solicitor when making your Will. However, a general guideline for wording is as follows:

“I GIVE to the EYE RESEARCH FOUNDATION free of all duties the sum of (amount in words) DOLLARS (\$ amount in figures) and I direct that the receipt of its Treasurer or other proper officer shall be full and sufficient discharge to my Executors.”

Many benefactors now prefer to make their bequest a percentage of their residuary estate because the value of a specific sum of money is readily eroded by inflation. However, this is entirely a matter for your decision.



CERA is a partner of Vision 2020 Australia

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