2012 Annual Report

Women and Infants Research Foundation

Affiliated with
The University of Western Australia
and King Edward Memorial Hospital

women & infants
research foundation
Western Australia

we can
SHAPE THE FUTURE
through RESEARCH
DISCOVERY
DEVELOPMENT

OUR MISSION:

TO CONDUCT, SUPPORT AND PROMOTE HIGH QUALITY RESEARCH FOR THE BENEFIT OF HUMAN HEALTH RELATING TO THE FIELDS OF REPRODUCTIVE HEALTH AND DISEASES OF WOMEN AT ALL AGES, AND HEALTH AND DISEASE OF EARLY LIFE AND THEIR INFLUENCE ON SUBSEQUENT HEALTH AND DISEASE IN LATER LIFE.

Table of Contents

PATRON'S MESSAGE

FRIENDS OF THE WOMEN & INFANTS RESEARCH FOUNDATION WESTERN AUSTRALIA

The Governor and I enjoyed our recent visit to King Edward Memorial Hospital where we had the opportunity to meet with, and applaud, the achievements of the Friends of the Women & Infants Research Foundation. We were also delighted to provide financial support for vital research, which the Friends kindly made us aware of.

Funds raised through the efforts and generosity of staff and volunteers help make this cutting edge research possible. It is exciting to see how this research is translated into new healthcare practices which directly improve the health of women and babies.

The work of the Friends provides an invaluable service that is selfless, inspiring and offers a helping hand wherever it is needed. Their commitment and effort directly improves the lives of others and is a wonderful example of serving the community.

It is a great privilege to be Patron of the 'Friends of the Women & Infants Research Foundation' in Western Australia and to support the important work they do.

Mrs Tonya McCusker
Patron

"The work of the Friends provides an invaluable service that is selfless, inspiring ..."

HONORARY LIFE MEMBERS:

Janet Holmes à Court
John Rawlinson
Rod Maslin
Emeritus Professor Con Michael
Anne Payne

ORGANISATIONAL CHART

prime areas of research

- Preterm birth: inflammation, infection and prediction
- Fetal origins of adult and childhood diseases
- The placenta in healthy and complicated pregnancies
- Prediction of pre-eclampsia
- Improving maternity healthcare delivery
- Anaesthesia and pain relief in pregnancy
- Health and nutrition of the newborn
- Fetal and neonatal heart and lung function
- Breastfeeding
- Drug use in pregnancy
- Gynaecological cancer

SPECIFIC OBJECTIVES

- To conduct and support research reflecting the Foundation's mission.
- To inform and educate the scientific and wider community of the results and implications of such research.
- To develop a sustainable funding and relationship management strategy to support the Foundation's mission.
- To strengthen the Foundation's collaborative partnerships with the King Edward Memorial Hospital campus, the UWA School of Women's and Infants' Health and other research partners within the wider research community.
- To foster research excellence from new and established investigators working towards the Foundation's mission.
- To enhance the research reputation and standing of the Foundation by raising its profile across the scientific and wider community.

HONORARY BOARD OF MANAGEMENT

Back Row (L-R):
Grey Egerton-Warburton, Craig Pennell, Jeff Keelan (not on Board), Graeme Boardley.
Middle Row: Tina Williams (not on Board), Jim Davies, Andrea Cole (not on Board), Yee Leung, Dorota Doherty (not on Board).
Front Row: Jann Rowley, John Newnham, Alan Good, Rowena Smith.
Absent:
Sally Bianchini, Elizabeth Needham.

CHAIRPERSON

Mr Alan Good
Chartered Accountant

DEPUTY CHAIRPERSON AND TREASURER

Ms Rowena Smith
Head of Function, Resources Industry

EXECUTIVE DIRECTOR

Winthrop Professor John Newnham

Professor, Maternal Fetal Medicine
King Edward Memorial Hospital
Head, School of Women's and Infants' Health
Deputy Dean, Faculty of Medicine, Dentistry and Health Sciences
The University of Western Australia

Ms Sally Bianchini
Journalist/Newsreader

Mr Graeme Boardley
Executive Director of Midwifery and Nursing
King Edward Memorial Hospital

Mr Jim Davies
Managing Director
Marketing

Mr Grey Egerton-Warburton *(commenced April 2012)*
Head of Corporate Finance
Hartleys

Mr Peter Hawkins *(retired November 2011)*
Company Director

Professor Yee Leung *(commenced April 2012)*
Head of Department of Western Australian Gynaecological Service
Director Surgical Education,
King Edward Memorial Hospital for women
Professor at the School of Women's and Infants' Health

Mr Gerald Major *(retired August 2011)*
Property Consultant

Ms Elizabeth Needham *(commenced February 2012)*
Barrister

Associate Professor Craig Pennell
Senior Lecturer, School of Women's and Infants' Health
The University of Western Australia
Certified Subspecialist in Maternal Fetal Medicine
King Edward Memorial Hospital

Professor Jane Pillow *(retired January 2012)*
Professor, School of Women's and Infants' Health, UWA
Viertel Senior Medical Research Fellow
Consultant Neonatologist, Women's and Newborns' Health Service

Ms Jann Rowley
Artist

Winthrop Professor Brendan Waddell
Deputy Dean, Faculty of Science
Professor, School of Anatomy, Physiology & Human Biology
The University of Western Australia

WITH GREAT PLEASURE, I PRESENT TO YOU THE 2011/2012 ANNUAL REPORT OF THE WOMEN AND INFANTS RESEARCH FOUNDATION.

This has been an exciting year for the organisation with an ever expanding research base and the valuable addition of new people to both our scientific staff and the Board.

During the year the Board welcomed Rowena Smith to the position of Deputy Chair/Treasurer and Grey Egerton-Warburton and Elizabeth Needham as new Members. Rowena and Grey bring valuable new expertise in management and finance to the organisation. Professor Yee Leung also joined the Board. Professor Leung has recently been appointed as the inaugural Professor of Gynaecological Oncology and will head the growth and development of research in cancers of women as well as advanced surgical training. This year Professor Jane Pillow, Peter Hawkins and Gerald Major retired from their positions and we thank them for contributing their time and expertise over the previous years.

In May 2012, the Board held a successful retreat at UWA Club on the Crawley Campus. This event provided a forum for the Board to outline its priorities and to plan for growth. The event has provided a valuable framework for the Board to continue to provide strategic direction into the future. We plan to make this retreat an annual event.

As for all similar organisations, the global financial crisis and its aftermath posed financial challenges for the Foundation. I am grateful to the members of the Investment Committee, Alan Good, Rowena Smith, Grey Egerton-Warburton and Andrea Cole for their wise counsel during this time. As a result of sound fiscal management, I am pleased to report that the Foundation remains in a strong financial position.

Many of our partner organisations provided on-going support during the year. I would like to express appreciation of the Board to Channel 7 Telethon Trust, McCusker Foundation, Lions District 201W1, RANZCOG, BHP Billiton, WA Charity Direct, Hartleys and Cash and Carry, as well as our many corporate and individual donors, many of whom wish to remain anonymous.

Many people are working hard to continue to make the Foundation such a successful venture. I would like to thank Winthrop Professor John Newnham who is our Executive Director; Professor Dorota Doherty who is Deputy Director and heads the Biostatistics and Research Design Unit; Professor Jeffrey Keelan and Dr Matt Kemp who head our two main laboratories; Tina Williams who is our Marketing and Development Manager; Anne-Marie Weekes who heads the Coffee and Gift Shop; Andrea Cole who is our senior accountant; Claire Williams who keeps our bookkeeping in order; Julie Rutgers who heads the First Photo Business; Chris Spencer who is the Foundation's Secretary; and Tony Smith who supports our information technology.

I trust that you will enjoy reading of the year's activities in the following pages. Each report has been written to both provide information on how we endeavour to improve health care through high quality research and education, and to provide an account of how we allocate our resources to ensure the maximum benefit for each dollar that has been entrusted to our care.

Alan Good
Chairperson

Many people are working hard to continue to make the Foundation such a successful venture.

EXECUTIVE DIRECTOR'S REPORT

...fostering and supporting

research aimed at improving the health and well-being of women and their babies.

One of our greatest priorities has been to understand how events before and soon after birth impact on life-long health.

» THE WOMEN AND INFANTS RESEARCH FOUNDATION (WIRF) IS WESTERN AUSTRALIA'S PRINCIPAL ORGANISATION DEDICATED TO FOSTERING AND SUPPORTING RESEARCH AIMED AT IMPROVING THE HEALTH AND WELL-BEING OF WOMEN AND THEIR BABIES. FOUNDED IN 1976, THE ORGANISATION CONTINUES TO GROW AND PROSPER AND IS PROUD TO PLAY A CENTRAL ROLE IN WESTERN AUSTRALIA'S MEDICAL RESEARCH COMMUNITY. THIS ANNUAL REPORT PROVIDES A SUMMARY OF MANY OF THE ORGANISATION'S ACTIVITIES AND ITS PEOPLE. THROUGHOUT THE REPORT YOU WILL BE ABLE TO READ OF THE STRATEGIES THAT WE EMPLOY TO MAXIMISE OUR ABILITY TO IMPROVE CLINICAL PRACTICE IN OUR STATE AND ELSEWHERE.

One of our greatest priorities has been to understand how events before and soon after birth impact on life-long health. By custom in our society, age is defined from the time of our birth. Biology, however, observes no such milestone. The events that occur in the uterus from development of the egg onwards are pivotal in preparing us for the outside world, and injuries to our developing organs often amplify with the passing years. Understanding the importance of these principles, and the mechanisms by which they occur, are vital as prevention of disease is most successful if we can tackle problems at their origins. WIRF researchers were pioneers in this area and many of our clinical and laboratory studies have been central to the development of this field in international terms.

The most important and prominent of these studies has been The Raine Study. This cohort study involving nearly 3000 Western Australian women and their children was begun in Carson House at King Edward Memorial Hospital in 1989. The study involved detailed measurements during pregnancy, making this the world's first large pregnancy-based cohort if its type. Follow-up of the children, now adults, in the Raine Cohort has been outstanding and this project stands as one of Western Australia's greatest contributions to medical science.

In November 2011, the Governor, Mr Malcolm McCusker AC, hosted the 21st birthday celebrations of the Raine Study in the grounds of Government House. The project now involves medical scientists across the spectrum of research in human health and disease. More than 85,000 pieces of information are available on each of the two thousand participants. Together, the many studies involve more than 150 researchers, most in Perth but many world-wide. The original funding was provided by grants from WIRF and the UWA-based Raine Foundation, since which more than $24 million has been attracted to Perth for its continuation. WIRF remains one of the key organisations that continues to underpin the Raine Study, along with The University if Western Australia, the Raine Foundation, the Institute for Child Health Research and Curtin University. Assoc Professor Craig Pennell has been the Scientific Director for the last 5 years and productivity of the project has increased greatly under his leadership. Further details are provided later in the Report.

Another of our organisation's greatest priorities has been to improve care of premature newborns and to discover how preterm birth may be prevented. Research conducted by ourselves and others has now taught us that the majority of early preterm births result from infection and inflammation. The infection however is not the same as we see in other fields of illness. Very different types of bacteria are involved, and often the infection remains silent and clinically hidden until late in the disease process. Working out how to identify these infections, and then treat them, is proving to be a great challenge. WIRF is supporting studies in our pregnant population and in our laboratories, aiming to unravel this story. The stakes are high. Preterm birth affects more than two and a half thousand children in Western Australia each year. Most will go on to live normal lives, many will suffer from severe disabilities and sadly some will not survive the struggle of being born too soon. The annual cost of their immediate care as newborn infants in Western Australia is approximately $50 million.

During the year, we were very pleased to be joined by Professor Yee Leung who has become our inaugural Professor of Gynaecological Oncology. Professor Leung will now lead the further development of research in the fields of women's cancer and advanced surgical training and we expect these initiatives to be state-wide. He also has been welcomed to the Board where plans for the new developments are in progress.

A key feature in our research strategy has been to acquire the latest in state-of-the-art laboratory equipment. The rate of progress in research methodologies has never been as rapid as it is now and considerable expertise and resources are required to take advantage of these advances. Under the leadership of Professor Jeffery Keelan and Dr Mathew Kemp, our research laboratories contain all the measurement systems that we require to tackle our major questions.

Research, however, can never be conducted in isolation and we in Western Australia need to be highly integrated with our national and international partners. Our many long-standing collaborations continue to prosper and new alliances are in development. Dissemination of research findings is primarily through publication in scientific journals and the outstanding productivity of our teams can be seen in their list of publications toward the end of this Report. Professor Jan Dickinson is now the Editor-in Chief of the Australian and New Zealand Journal of Obstetrics and Gynaecology and we are proud that the international rankings of the Journal are improving under her leadership. Professor Dickinson is the first woman to hold this important position.

A vital feature of any research organisation is its governance structure. Defining research priorities, allocating resources and monitoring the success of projects requires appropriate systems of assessment and review. We are most fortunate that Winthrop Professor Brendan Waddell, Deputy Dean of Science at UWA, chairs our Committee that provides the Board with advice on grant applications and financial support for our research students. The members of the Committee are volunteers and we are grateful for the donation of their time and expertise.

Research, however, can never be conducted in isolation and **we in Western Australia need to be highly integrated** with our national and international partners.

EXECUTIVE DIRECTOR'S REPORT *CONTINUED*

foundation
staff


Andrea Cole


Christine Spencer


Claire Williams


Anne-Marie Weekes


Julie Rutgers


Tina Williams


Tony Smith

WIRF relies heavily on its volunteers. The Board members and members of our Investment and Scientific Grants Committees are also volunteers. Many in the work-force that enables our Coffee and Gift Shop to be so effective and profitable also donate their time and energy. We are eternally grateful to each and every one of our volunteers. These wonderful contributions by members of our general community are of great value to the Foundation and the Hospital.

On a personal note, I would like to thank the clinicians and scientists who take leadership roles in our various research units: Professor Dorota Doherty who heads the Biostatistics and Study Support Unit and also is Deputy Director; Professor Jeffrey Keelan who heads the WIRF/UWA Laboratories; Dr Matt Kemp who heads the WIRF/Lotterywest Perinatal Research Laboratories on the UWA Crawley Campus; and Shaofu Li who is our Laboratory Manager. The Reports from each of these Units can be found in the following pages.

I would also like to extend my sincere gratitude to the many staff whose daily work and loyalty is making the Foundation so successful: Annemarie Weekes as Manager of the Coffee and Gift Shop; Tina Williams who is Marketing and Development Manager; Andrea Cole who is our accountant; Claire Williams who is our book keeper; Tony Smith who provides our information technology support; Julie Rutgers who heads the First Photo Business; and Christine Spencer who is the Foundation's Secretary.

Finally, I would like to express my appreciation to the Board and its members who continue to provide the Foundation with leadership, strategic direction and governance. In particular, I would like to thank Alan Good who is the Chair, and Rowena Smith who is the Deputy Chair for their on-going support and commitment.

This Report provides a summary of the Foundation's activities and productivity for the year. I hope you find it interesting and of value.

Winthrop Professor John Newnham
Executive Director

GOVERNANCE STATEMENT

Scientific Grants Committee Members:

Chairperson

Professor Brendan Waddell

Deputy Dean, Faculty of Science

Professor, School of Anatomy, Physiology and Human Biology

The University of Western Australia

Committee

Professor John Newnham

Professor, Maternal Fetal Medicine

Executive Director, Women and Infants Research Foundation

Head, School of Women's and Infants' Health

The University of Western Australia

Professor Jane Pillow

(resigned January 2012)

Professor, School of Women's and Infants' Health, UWA

Viertel Senior Medical Research Fellow

Consultant Neonatologist, Women's and Newborns' Health Service

Professor Jeffrey Keelan

(commenced May 2012)

Head Women and Infants Health Research Laboratories

School of Women's and Infants' Health

The University of Western Australia

King Edward Memorial Hospital

Dr Daniela Ulgiati

Lecturer, School of Chemistry and Biochemistry

The University of Western Australia

Dr Katherine Sanders

Assistant Professor, School of Anatomy, Physiology and Human Biology

The University of Western Australia

BOARD OF DIRECTORS

The Board of Management provides strategic direction to Foundation management to ensure the quality, efficiency and longevity of our research, clinical and community activities. The Board meets six times each year. All Board Members serve on a voluntary basis.

CORPORATE AND RESEARCH ETHICS

All employees are expected to discharge their duties in good faith and act honestly in the best interest of the Foundation, striving at all times to enhance the reputation and performance of the Foundation. All scientific studies conducted by the Foundation are approved by the Ethics Committee of the Women and Children's Health Service and / or the Human Research Ethics Committee and Animal Ethics Committee of The University of Western Australia.

RISK MANAGEMENT

All employees and volunteers of the Foundation undergo criminal screening and blood tests in compliance with the requirement of the Women and Children's Health Service, irrespective of whether they have direct contact with WCHS children or not.

FINANCIAL REPORTING

The Foundation's financial year ended on 30th of June 2012. Our Chairperson and Treasurer jointly signed off on the Annual Financial Reporting process on behalf of the Board. A copy of the Foundation's financial reports for year end 30th of June 2012 are available on www.wirf.com.au.

AUDIT GOVERNANCE

The Foundation engages Crowe Horwath as an external audit team to independently review its financial reports and uphold the integrity of the reporting process.

NOT FOR PROFIT STATUS

The Foundation operates as an incorporated not for profit organisation. The Australian Taxation Office has endorsed the Foundation as an Income Tax Exempt Charitable Entity and a Deductible Gift Recipient. This status ensures that anyone donating to the Foundation can claim the full tax benefit. The Foundation also holds a Charitable Collections Licence from the Department of Consumer and Employment Protection in Western Australia.

INVESTMENT COMMITTEE

Members of this Committee are appointed by the Board on an honorary basis. Members of the committee meet twice a year.

Chairperson: Mr Alan Good, Chartered Accountant

Ms Rowena Smith, Head of Function, Resources Industry

Mr Grey Egerton-Warburton, Head of Corporate Finance, Hartleys

Andrea Cole, Accountant, Women and Infants Research Foundation

SCIENTIFIC GRANTS COMMITTEE

Members of this Committee are appointed by the Board on an honorary basis. Half of the members of the Committee are employed externally to the KEMH campus. The Committee meets to consider research applications for financial support and advises the Board on suitability for funding. The Committee also provides the Board with advice on scientific matters as required. Specifically they review applications for Starter Grants, Capacity Building Grants and PhD Scholarships.

THE FOUNDATION HAS A SPECIFIC OBJECTIVE TO *PROMOTE HIGH QUALITY RESEARCH AND FOSTER NEW RESEARCHERS.* THIS IS ACHIEVED THROUGH PROVIDING THREE SPECIFIC TYPES OF GRANT FUNDING AND SCHOLARSHIPS.

STARTER GRANT FUNDING

Starter grants are predominately for new investigators embarking on their research career. Grants are for a maximum of $15,000 and awarded for a period of 12 months. Five Starter Grants were awarded in 2011/12:

RESEARCH TITLE	RESEARCHERS	AMOUNT	BRIEF DESCRIPTION OF RESEARCH
Early life changes in airway structure and function in asthma	Dr P B Noble	$14,980	There is increasing support for the view that asthma has an early life origin. Notably, defects in respiratory function can be traced back to the first few days of birth and represent a strong risk for the development of asthma in childhood and progression into adulthood. The present study will use a sheep model to examine the known association between asthma and common complications during pregnancy: preterm birth and chorioamnionitis (a condition where the membranes of the fetus become inflamed).
Production and Function of Amniotic Fluid Cationic Host Defence Peptides	Dr S J Stock Dr M W Kemp Professor J Keelan Dr M Payne	$14,605	Cationic host defence peptides (CHDPs – also called "natural antimicrobials") are produced in the womb during pregnancy. We think they are important in preventing infections that can cause early labour and damage to babies. We plan to research CHDPs in the fluid surrounding the developing baby, to find out how they are produced and whether they can help clear infections that could cause preterm labour. We think this work may lead to development of treatments to prevent preterm birth.
Prevalence of *Ureaplasma* ssp. During pregnancy in Western Australian women	Dr M P Payne	$15,000	Bacterial infection is present in ~40% of cases of preterm birth. In particular, a bacteria called ***Ureaplasma***, is frequently found, yet current information regarding its presence within the vaginal tract of Australian women during pregnancy is lacking. Vaginal swabs from 200 pregnant women will be examined for Ureaplasma at three defined pregnancy internals. This information is required so that larger studies can be designed to assess the usefulness of diagnosing and treating Ureaplasma infection for the prevention of preterm birth.
Microarray Analysis of the Fetal Skin Transciptome following in utero exposure to bacterial agonist	Mr T Cox Dr M Kemp	$15,000	Understanding the inflammation caused by the fetal skin in response to uterine infection is key to our efforts to prevent preterm birth and fetal injury. This proposal aims to use a new, sheep-specific gene expression platform to generate a comprehensive picture of the inflammatory mediators produced by the fetal skin.

GRANT FUNDING *CONTINUED*

RESEARCH TITLE	RESEARCHERS	AMOUNT	BRIEF DESCRIPTION OF RESEARCH
A prospective observational Study of the effect of Ovarian Cystectomy on Ovarian Reserve (SOCOR study)	A/Professor K A Karthigasu Professor R J Hart Dr B R McElhinney Dr A C Beard Dr T J Hunter	$8,800	This study aims to find out if "the reserve of the ovary" (which means the number of eggs left in the ovary) is changed after surgery to remove ovarian cysts. To determine this, a blood test that measures ovarian function will be taken both before the operation and six weeks, three months and six months after the operation to see if there is any change.

PhD SCHOLARSHIPS (TOP UP FUNDED)

The PhD Scholarships are a component of a wider strategy designed to nurture and develop promising researchers. The applicants must meet the requirements for candidature for the degree of Doctor of Philosophy by The University of Western Australia, School of Post Graduate Studies. The maximum funding is $12,500 (matched by UWA) for three years with a possible extension of 12 months.

RESEARCH TITLE	RESEARCHER	AMOUNT
Development of an individualised approach to the assessment and modification of antenatal and postnatal growth	Dr Scott White	$5,000 per annum for three years with a one-off $3,000 travel allowance (awarded 2010)
Breastfeeding and reduced obesity risk: What goes wrong when breastfeeding stops?	Foteini Hassiotou	$12,500 per annum for three years with a one-off $3,000 allowance for consumables and travel (awarded 2010)
Effect of milk composition and milk volume on gastric emptying in the preterm infant	Sharon Perrella	$12,500 per annum for three years with a one-off $3,000 travel allowance (awarded 2009)
Stress across the lifespan, from conception through adolescence to adulthood: How does it affect our mental health	Carly Herbison	$5,000 per annum for three years with a one-off $3,000 allowance for consumables and economy travel (beginning 2012)

CAPACITY BUILDING GRANTS

Capacity Building Grants provide flexible support to allow investigators to develop their capacity to assist them in attaining a level of productivity and capability sufficient to attract nationally competitive grant funding. Grants are a maximum of $35,000 per year for 3 years which is subject to satisfactory performance at yearly reviews.

RESEARCH TITLE	RESEARCHERS	AMOUNT	BRIEF DESCRIPTION OF RESEARCH
The Fetal Skin and Preterm Birth	Dr M W Kemp and Associate Investigators Professor J Newnham Professor S Kallapur Professor A Jobe	$35,000 per year (for three years awarded 2010)	The immediate significance of this proposal will be the development of a unique research programme within WIRF and the School of Women's and Infants' Health at King Edward Memorial Hospital/WIRF. This proposal will focus on enhancing our understanding of the inflammatory response capacity of fetal skin and its potential role in complications associated with perinatal inflammation.
Preterm Birth Genome Project	Dr C E Pennell Associate Investigator Dr Jennifer Henderson	$35,000 per year (awarded 2008 for three years until 2011)	The goal of the preterm birth genome project (PGP) consortium is to identify genes that affect susceptibility to preterm birth (and other adverse pregnancy outcomes associated with preterm birth).

Last year's awarded grants are reported in this publication.

STARS EVENT & RISING STARS SYMPOSIUM 2011

EACH YEAR THE WOMEN AND INFANTS RESEARCH FOUNDATION PROUDLY HOSTS THE STARS EVENTS. THESE OUTSTANDING SUPPER EVENTS SHOWCASE THE MOST RECENT RESEARCH FINDINGS IN THE FIELDS OF REPRODUCTION, WOMEN'S HEALTH AND NEWBORN MEDICINE.

Held over two consecutive evenings in September, the Stars Events bring together our finest medical experts and top emerging medical researchers to present on various topics relating to women's and infants' health. The audience consists of researchers and medical and health professionals from hospitals and clinics throughout WA.

STARS EVENT 2011

Gynaecological Cancer... its diagnosis and management is under **constant review and scrutiny... what will we be doing in 2015?**

Stars Event 2011 was held at The Royal Perth Yacht Club, Crawley. The theme **'Through the Looking Glass'** examined the recent advances in the prevention and cure of Gynaecological Cancer. Our three leading experts presented on the topics below:

'What we do not know'

Despite being the most common gynaecologic cancer and generally associated with an excellent prognosis, there is controversy in the surgical and post-surgical management of apparent early stage endometrial cancer.

Professor Yee Leung's presentation highlighted the controversial areas and stimulated research questions.

Professor Yee Leung is the Head of Department of the Western Australian Gynaecologic Cancer Service and the Lead Clinician for the Western Australian Cancer and Palliative Care Network (Gynaecology).

'I can see clearly now.....or can I?'

Imaging techniques such as Ultrasound, Xray, CT, MRI and PET are used in the diagnosis and investigation of cancers. The lay public and many doctors place great reliance on the ability of 'scans' to detect or exclude the presence of cancer. Professor Hammond discussed the benefits and limitations of these imaging techniques (using endometrial cancer as an example) and explained what we (as potential patients and doctors) can reasonably expect of these tests.

Clinical Professor Ian Hammond is a Gynaecologic Oncologist at the WA Gynaecologic Cancer Service and a Clinical Professor in the School of Women's and Infants' Health at UWA. He has been actively involved in teaching and surgical training throughout his career.

KEYNOTE PRESENTATION

'What we will be doing in 2015'

Despite being the most "harmless" of all gynaecological cancers, the diagnosis and management of uterine cancer is under constant review and scrutiny. Will histopathological assessment survive or will molecular diagnosis take over? Will we continue removing the uterus surgically when smarter, less invasive and more targeted options increasingly become available?

Professor Andreas Obermair is a Senior Staff Specialist in Gynaecological Oncology at the Royal Brisbane and Women's Hospital, Brisbane and a Professor of Gynaecological Oncology at the University of Queensland. Professor Obermair also serves as the Director of Research at the Queensland Centre for Gynaecological Cancer and holds memberships and positions in many Australian and international medical societies.

STARS EVENT 2011 *CONTINUED*

Professor John Newnham led the panel discussion with our team of experts on the advances in prevention and cure of gynaecologic cancer. The Stars Event concluded with a cocktail exhibition supported by our event sponsors - Postgraduate Medical Education at King Edward Memorial Hospital, Olympus, Cancer Council Western Australia and the Western Australia Clinical Oncology Group.

Rising Stars 2011 L-R back row - Shaofu Li, Prof Andreas Obermair, Dr Matt Kemp, Dr Peter Noble
L-R front row – Prof Dorota Doherty, Dr Helen Atkinson, Dr Stefan Minocchieri, Dr Kym Guelfi, Dr Foteini Hassiotou, Prof John Newnham

RISING STARS SYMPOSIUM 2011

Rising Stars Symposium was held at Matilda Bay Restaurant. This special event showcased WA's top emerging medical researchers in women's and infants' health and revealed their latest discoveries in short, sharp research reviews:

RESEARCH TITLE	RESEARCHER
Inflammation of the Fetal Skin	Dr Matt Kemp, Research Assistant Professor, School of Women's and Infants' Health, UWA, Manager WIRF/Lotterywest Perinatal Research Laboratories
The effect of body temperature on susceptibility of the preterm newborn to ventilator induced long injury	Dr Peter Noble, Research Assistant Professor, School of Women's and Infants' Health, The University of Western Australia
The Fit Mum Study: Investigating the benefits of supervised home-based exercise for glucose tolerance during pregnancy	Dr Kym Guelfi, Assistant Professor, School of Sport Science, Exercise and Health, The University of Western Australia
Pre-term birth in Chinese women – in China, Hong Kong and Western Australia	Shaofu Li, Research Associate, Laboratory Manager, School of Women's and Infants' Health, The University of Western Australia
Nebulised surfactant in moderately preterm infants with mild respiratory distress	Dr Stefan Minocchieri, Neonatal Registrar, King Edward Memorial Hospital
Breastmilk stem cells: Fishing gems	Dr Foteini Hassioutou, PhD Student, School of Biomedical, Biomolecular and Chemical Sciences, The University of Western Australia
Western Australian Pregnancy Cohort: fetal programming and stress hormones in adolescence	Dr Helen Atkinson, Research Assistant Professor, School of Women's and Infants' Health, The University of Western Australia

BIOSTATISTICS AND RESEARCH DESIGN UNIT

THE BIOSTATISTICS AND RESEARCH DESIGN UNIT PROVIDES STATISTICAL COLLABORATION AND CONSULTATION IN THE DESIGN, CONDUCT, ANALYSIS, INTERPRETATION, AND REPORTING OF RESEARCH STUDIES CONDUCTED BY INVESTIGATORS ON THE KING EDWARD MEMORIAL HOSPITAL CAMPUS AND AFFILIATED INSTITUTIONS.

Our involvement in research projects ranges from short-term consultations to ongoing long-term collaborations on studies supported by research funding. Short-term statistical consultations may require one or two sessions on designing experiments, initial plans for data collection, or advice about the most appropriate statistical methodology for data analysis. These short-term consultations may also involve assisting with interpretation of previously compiled results, or initiating data analysis of an already completed study. Investigators are encouraged to obtain statistical advice for their research at any stage of the project and these short-term consultations often develop into ongoing longer term collaborations.

Most research projects supported by competitive grants benefit from an ongoing statistical collaboration. The Unit members are often involved in grant proposal writing that initially includes formulation of primary and secondary objectives, hypothesis formulation and testing, sample size estimation, planning for study monitoring and inclusion of interim analyses. Our contribution to the planning of experiments also includes the development of appropriate statistical approaches and computational algorithms to meet project specific needs. We are also involved in data management and contribute to the design of data collection instruments and corresponding databases, planning of data entry and data cleaning procedures, and data integrity checks. Our main activities consist of the data analysis of completed studies which involve the selection of appropriate descriptive and hypothesis-testing statistics as well as the preparation of results for presentations either in tabular or graphical format. Other important activities include conducting independent interim analyses for clinical trials, reviewing grants and manuscripts, presenting seminars on statistical methods in medical research and supervising students.

Over the last 12 months we participated in collaborative research with investigators from King Edward Memorial Hospital campus, The Institute for Child Health Research, all four Western Australian universities, University of Sydney, University of Hong Kong, and Nanjing University in China. Some of our long term collaborations resulted in taking a leading role on projects that require involved epidemiological study designs. For example, we have recently received funding from the Western Australian Health Department to conduct an evaluation of pregnancy outcomes in planned home births in Western Australia. This evaluation is difficult to perform due to the fact that only about 500 women a year plan home birth in Western Australia. In this project we will not only evaluate the outcomes of planned home births that occurred over the last decade available in the State pregnancy database, but we will also recruit women who plan home birth during pregnancy and ask for their reasons in choosing home birth and about their experience of home birth.

Our main aim is to continue to increase the level and effectiveness of biostatistics used on campus and we look forward to meeting new challenges in women's health and reproduction in the coming year.

Professor (Adj) Dorota Doherty
Head

... to continue
to increase the level
and
effectiveness
of
biostatistics
used
on campus.

Back Row (L-R): James Humphreys, Jeff Cannon, Angela Jacques
Front Row: Liz Nathan, Dorota Doherty

THE WOMEN AND INFANTS RESEARCH FOUNDATION SCHOOL OF WOMEN'S AND INFANTS' HEALTH (WIRF-SWIH) LOTTERYWEST PERINATAL RESEARCH LABORATORIES

THE WIRF-SWIH PERINATAL RESEARCH LABORATORIES ARE LOCATED WITHIN THE SCHOOL OF WOMEN'S AND INFANTS' HEALTH FOOTPRINT AT THE UNIVERSITY OF WESTERN AUSTRALIA'S LARGE ANIMAL FACILITY. A MAJOR REFIT OF THE PC2 LABORATORY IN 2011, IN ADDITION TO ON-GOING RECONFIGURATION OF ADDITIONAL LABORATORY SPACES, SEES WIRF-FUNDED INFRASTRUCTURE PLAYING A CENTRAL AND HIGHLY VALUED ROLE IN POWERING THE PERINATAL RESEARCH UNDERTAKEN BY THE SCHOOL OF WOMEN'S AND INFANTS' HEALTH.

With the laboratory-based phase of our 2012 studies now at full speed in the lead up to conference abstract submission deadline, I am pleased to report another productive and successful year of work within the WIRF-SWIH Perinatal Research Laboratories.

Over the course of the past twelve months we have enhanced the capabilities of these facilities with the acquisition of an ultrapure water still, a dissecting microscope, a new ultra-low temperature freezer, an automated protein / nucleic acid purification system and additional centrifuge capacity. Further minor capital works have also been undertaken, with nitrogen gas now delivered to the PC2 laboratory via a mains gas system. Significant credit for these developments is due to Dr Matt Payne, recently recruited to the School to oversee the development of the microbiological aspects of the School's preterm birth studies.

During 2011 – 2012, funding provided to the WIRF-SWIH Laboratories by the Foundation has supported work aimed at furthering our understanding of the mechanisms underlying preterm birth, fetal injury, fetal infection, neonatal resuscitation and airway injury, macrolide pharmacokinetics in pregnancy and the microbiome in pregnancy. These important research projects were funded by leading national and international agencies including the National Health and Medical Research Council (NHMRC, AU), the National Institutes of Health (NIH, USA), the Women and Infants Research Foundation (WIRF, AU) and the Financial Markets Foundation for Children (FFC, AU). In the past year, the WIRF-SWIH laboratories have made an invaluable contribution to work published by our consortium in leading international journals including Journal of Immunology, Reproductive Sciences, American Journal of Physiology and PLoS ONE.

The facilities funded by WIRF are unique in allowing our research team to transfer work seamlessly from the operating theatre to a purpose-built analytical laboratory. As such, the WIRF-SWIH Laboratories play a key role in allowing both the School of Women's and Infants' Health and the Foundation to advance their shared goal of improving outcomes for mothers and their babies.

In closing, I would like to offer my thanks to the Foundation and my colleagues in the School (with particular acknowledgement to Professors Newnham and Keelan) for their support in delivering another successful year for the WIRF-SWIH Perinatal Research Laboratories.

Matthew W. Kemp PhD *(UNSW)*
Research Fellow
UWA School of Women's and Infants' Health
Sheep Research Scientific Manager
WIRF / Lotterywest Perinatal Research Laboratories

Collaborators 2011-2012:

Perth, Western Australia

Mr Thomas Cox BMedSci

Professor Jeffrey Keelan PhD

Dr Matthew Kemp PhD

Dr Zhang Li

Professor John Newnham MD FRANZCOG

Dr Matthew Payne

Dr Sarah Stock

Sendai, Japan

Dr Yuichro Miura

A/Prof Masatoshi Saito MD PhD

Cincinnati, Ohio

Dr Tate Glissen

Dr Noah Hillman MD

Professor Alan Jobe MD PhD

A/Prof Suhas Kallapur MD

Dr Piedro Presicce

Maastricht, Netherlands

Ms Jennifer Collins PhD Candidate

Professor Boris Kramer

L-R: Noah Hillman, Matt Kemp, Matt Payne

WOMEN AND INFANTS HEALTH RESEARCH LABORATORIES

THE WOMEN AND INFANTS HEALTH RESEARCH LABORATORIES HAVE HAD YET ANOTHER BUSY YEAR EXTRACTING, ANALYSING, VISUALISING AND MEASURING SAMPLES AND TISSUES FROM THE VARIOUS PROJECTS UNDERWAY IN THE HOSPITAL. THE LABORATORIES ARE LOCATED ON THE SECOND FLOOR OF KING EDWARD MEMORIAL HOSPITAL IN THE SCHOOL OF WOMEN'S AND INFANTS' HEALTH (THE UNIVERSITY OF WESTERN AUSTRALIA). WITHIN THE MODERN, WELL-EQUIPPED LABORATORIES ARE SEPARATE RNA, DNA, IMAGE ANALYSIS AND TISSUE CULTURE LABORATORIES, PLUS A LARGE GENERAL BIOMEDICAL LABORATORY AND FREEZER STORAGE FACILITIES.

The Laboratories are funded by WIRF and also receive financial support from Lions International which provides funds on an annual basis for the purchase of essential laboratory equipment such as plate readers, perfusion monitors, autoclaves and electrophoresis equipment.

The Laboratories have functioned smoothly and efficiently - and within budget - due in large measure to the tireless efforts of the Laboratory Manager Mr Shaofu Li. The laboratories support both clinical and basic research undertaken through the Foundation, the Hospital and University, as well as provide analytical facilities for research conducted in the Perinatal Laboratories on UWA campus in Crawley. The laboratories currently support the research of four Professors, one Associate Professor, five Assistance Research Professors, four Research Assistants and two Research Midwives. The UWA School also has four PhD and one MSc student with laboratory-associated projects.

The Laboratory again hosted a group of around 24 year eleven school students from Kingsway Christian College who were indoctrinated into the advantages and benefits of a career in medical science. The trip was organised by Professor Jeff Keelan with the University's Aspire programme which focuses on students from home environments where attending University is not the norm. The kids ate lunch catered by the WIRF café. Thanks also to Dr Matt Kemp, Dr Yong Song, Tom Scott, and Rebecca Seth for donating several hours of their time to help with this event.

Professor Jeff Keelan
Head

Dr Demelza Ireland, Professor Jeffrey Keelan, Ms Lisa Stinson, Dr Kamali Pugazhenthi, Associate Professor Gautam Kaul, Research Fellow Mr Sarmah bin Nayeem

Key Highlights:

Receipt of a **NHMRC infrastructure grant** to purchase a **RotorGene-Q HRM real-time PCR analyser**

Establishment of a **placental perfusion monitoring system**

Visit by students from Kingsway College as part of the UWA Aspire Programme

PREVENTING PRETERM BIRTH

» PRETERM BIRTH IS THE SINGLE GREATEST PROBLEM IN HUMAN REPRODUCTION IN DEVELOPED COUNTRIES, INCLUDING AUSTRALIA. IN WESTERN AUSTRALIA, MORE THAN 2,500 BABIES ARE BORN PREMATURELY EACH YEAR, COMPRISING 8-9% OF ALL BIRTHS. MOST OF THESE CHILDREN CAN EXPECT TO GO ON AND LEAD HEALTHY AND PRODUCTIVE LIVES, BUT MANY WILL SUFFER FROM DISABILITIES INCLUDING CEREBRAL PALSY, LEARNING AND BEHAVIOURAL DIFFICULTIES AND LUNG DISEASE. DISCOVERING HOW TO PREVENT PRETERM BIRTH IS ONE OF THE FOUNDATION'S HIGHEST PRIORITIES.

The definition of preterm birth is birth before 37, and after 20, completed weeks of gestation. There are many different pathways to early birth with different causes at different ages. A major advance in this field has come from the discovery that two thirds of very early births, the ones we are most keen to prevent, arise from infection and inflammation within the uterus. We had thought that some of this inflammation may have spread from inflamed gums, but our recently completed Smile Study has now taught us that treating periodontal disease will not affect pregnancy outcomes. The infection is of a very different type.

Research by ourselves and others has shown that the major cause of these very early births appears to be colonisation with a type of bacteria called *Ureaplasma*. These organisms are unique. They are the bacteria most frequently associated with preterm birth and in many pregnancies they appear to be harmless while in others they lead to early labour and infection of the newborn infant. Treating these infections is proving to be a major challenge. The infection is often silent with no symptoms or signs and the antibiotics that they respond to have very poor passage across the placenta.

Our laboratory studies are providing answers to some of these questions. We have shown exactly how in-effective our major antibiotics are in being able to cross the placenta and gain access to the fetus, and we are now exploring ways in which this passage may be improved. We also are defining the exact proportion of pregnancies in our population that may be affected, by studying markers of inflammation and infection in the vagina and amniotic fluid. These studies are vital if we are to design clinical trials that will have the ability to identify the pregnant women most at risk, and to then effectively treat the infection and prevent early labour.

Our capabilities have been expanded by Dr Matt Payne who has now joined our team. Dr Payne is a research microbiologist with expertise that now enables us to separately identify and study the different types of *Ureaplasma*. There are at least a dozen different varieties of this organism and each is expected to have different virulence and susceptibility to treatment. Dr Payne is now determining the prevalence of each type in pregnant Western Australian women. The results of his work are taking us closer to our goal of finding an effective strategy to prevent more than half of early preterm births.

TELETHON PRETERM BIRTH GENOME PROJECT

Preterm Birth Prevention

PRETERM BIRTH (PTB) IS A SERIOUS AND GROWING PROBLEM WITH OVER 15 MILLION BABIES BORN PREMATURELY EACH YEAR – THIS IS MORE THAN ONE IN TEN OF ALL BABIES BORN AROUND THE WORLD. A SIGNIFICANT PROPORTION OF INFANT MORBIDITY AND MORTALITY CAN BE DIRECTLY ATTRIBUTED TO PRETERM BIRTH.

The Preterm Birth Genome Project (PGP) was initiated by the Preterm Birth International Collaborative (PREBIC) in 2007. The PGP is a large multinational study lead by the World Health Organisation (WHO) investigating genes associated with preterm birth. DNA from 5000 mother infant pairs is being collected at numerous sites around the world incorporating participants from Chinese, Indian, African-American, Caucasian and Latino populations. The consortium aims to identify susceptibility genes by pooling resources from multinational sources from six continents to conduct a Genome Wide Association Study (GWAS) across five geographic populations. Through the use of candidate gene studies, and a GWAS using DNA from Caucasian women, the Western Australian node of the PGP has led research leading to the identification of a number of genetic variants associated with an increased risk of PTB. When combined with an individual's epidemiologic risk factors, this enables the prediction of a personalised risk that can be as high as three times the background risk.

Until recently, the possibility of preventing a significant proportion of PTBs has remained elusive. We now have available a variety of strategies that provide a real chance of reducing the rate of PTB. *The critical issue with interventions to reduce the rate of PTB is identifying individuals at greatest risk who will benefit the most from treatment;* this is a critical issue in environments with under-resourced health care systems. This project is a step towards the personalisation of care for women at risk of PTB. Targeted prevention programs amongst a high-risk population have been shown to result in a 40% reduction in the risk of early PTB and a reduction in the rate of major neonatal morbidity and mortality. The issue with PTB prevention programs is how do we identify those at highest risk? We propose that the development and incorporation of genetics into predictive models utilising individualised genetic risk appraisals presents an exciting addition to our clinical ability to identify women in whom PTB prevention strategies will be effective.

To achieve this goal, the PGP team, who have been working successfully in this field for a decade, have designed a research program that combines clinical and genetic research with translation to develop a tool to predict an individualised risk of PTB. *We are now on the cusp of being able to translate what has been learned into what can be done in both the developing and developed world.*

Chief Investigator:

Associate Professor Craig E Pennell MBBS (Hons) PhD (Dist) FRANZCOG CMFM

Researchers:

Wei Ang BCM (Hons) MSc

Rebecca Seth BSc

Blagica Penova-Veselinovic MSc

Melanie White BSc BMedSci (Hons)

Research Midwives:

Jan Mc Farlane RN RM

Narisha Pendall BSc

Sponsors:

World Health Organisation

March of Dimes Birth Defects Foundation

Channel 7 Telethon Trust

Women and Infants Research Foundation

International Collaborators:

Michael Katz MD, National March of Dimes, USA

Mario Merialdi MD MPH PhD, World Health Organisation, Switzerland

Ramkumar Menon PhD, University of Tennessee, USA

George Davey-Smith PhD, Bristol, UK

Eunhee Ha PhD, Korea

Felipe Vadillo-Ortega PhD, Instituto Nacional de Perinatologia, Mexico

Scott Williams PhD, Vanderbilt, USA

Tim Frayling PhD, UK

Caroline Relton PhD, UK

David Olson MD, Canada

Suzanna Tough PhD, University of Calgary, Canada

(L-R) Carly Herbison, Blagica Penova-Veselinovic, Wei Ang, Craig Pennell, Melanie White, Christopher White, Rebecca Seth, Tegan McNab, Helen Atkinson

(Absent: Jan McFarlane, Narisha Pendal, Julie Marsh, Richard Maganga, Nicole Warrington, Priya Parmar, Scott White)

WESTERN AUSTRALIAN PRETERM BIRTH FAMILY GENETIC STUDY

» IT IS CURRENTLY KNOWN THAT GENES ARE ASSOCIATED WITH THE RISK OF PRETERM BIRTH, AND THE BEST PREDICTORS OF PRETERM BIRTH ARE EITHER HAVING A PREVIOUS PRETERM BIRTH, OR HAVING A SISTER WHO HAS HAD A PRETERM BIRTH. THE WESTERN AUSTRALIAN PRETERM BIRTH FAMILY HAS BEEN ESTABLISHED TO INVESTIGATE THE GENETIC BACKGROUND OF FAMILIES WHO ARE AFFECTED BY RECURRENT PRETERM BIRTH.

The Western Australian Preterm Birth Family Study will recruit members from three generation of families who have been affected by recurrent preterm birth; this will include grandparents, parents, aunts and uncles of the preterm babies, and the preterm babies themselves. The genomes of the participants will be sequenced – each individual letter of their genetic code will be discovered. This comprehensive investigation utilising data from numerous generations of the same family will enable the identification of genes which are related to preterm birth.

Once genes associated with preterm birth have been identified, it will be possible to calculate a personalised 'preterm birth risk score' incorporating information about a patients genes, environment and other relevant factors. This will enable preterm birth prevention methods to be targeted towards women who are most at risk of preterm birth.

...the genomes of the participants will be sequenced -

each individual letter of their genetic code will be discovered.

Chief Investigator:

Associate Professor Craig E Pennell
MBBS (Hons) PhD (Dist)
FRANZCOG CMFM

Researchers:

Wei Ang BCM (Hons) MSc

Rebecca Seth BSc

Blagica Penova-Veselinovic MSc

Melanie White BSc BMedSci (Hons)

Research Midwives:

Jan Mc Farlane RN RM

Narisha Pendall BSc

Major Sponsors:

Channel 7 Telethon Trust

Women and Infants Research Foundation

THE FETAL SKIN AND PRETERM BIRTH

Preterm Birth Prevention

» THE IMPORTANCE OF INTRAUTERINE INFECTION IN PROMOTING THE *IN UTERO* INFLAMMATION RESPONSIBLE FOR MANY CASES OF PRETERM BIRTH IS WELL APPRECIATED IN OBSTETRIC RESEARCH AND CLINICAL PRACTICE. MORE RECENT DATA SUGGEST THAT A NUMBER OF THE SAME INFLAMMATORY PROCESSES RESPONSIBLE FOR PRETERM BIRTH ALSO PLAY A ROLE IN THE INDUCTION OF FETAL BRAIN INJURY. AS SUCH, IDENTIFYING THE FETAL AND / OR MATERNAL TISSUES RESPONSIBLE FOR THE INDUCTION AND AMPLIFICATION OF *IN UTERO* INFLAMMATION IS KEY TO THE DEVELOPMENT OF ANTIMICROBIAL / ANTI-INFLAMMATORY INTERVENTIONS AIMING TO PREVENT OR DELAY PRETERM BIRTH.

The fetal skin is exposed, in its entirety, to the amniotic environment. It is highly vascularised, comprised of immunoreactive keratinocytes (in the fetal epidermis) and comprises some 10% of fetal weight at term. Until as recently as 2009, very little was known about the fetal skin's role in *in utero* inflammation and prematurity.

During 2009, we hypothesised that the fetal skin contributes to *in utero* inflammation through the activation of the skin's innate immune system by bacterial agonist, leading to a release of inflammatory mediators into amniotic fluid and a fetal systemic inflammatory response with elevated risk of serious neonatal morbidity and mortality. We also hypothesised that inflammation and steroid administration induce early functional maturation of the fetal skin.

The second year of the Capacity Building Grant has seen further advances in our understanding of the role played by the fetal skin in preterm birth. We have now published the first three papers describing qualitative and quantitative changes in localised and systemic inflammatory mediator signalling in the fetus and amniotic fluid in response to localised fetal skin inflammation.

In the past year we have presented eight peer-reviewed abstracts at conferences in Australia (March 2012, Perinatal Society of Australia and New Zealand Annual Meeting, Sydney; March 2012, Society for Gynaecological Investigation Annual Meeting, San Diego CA; April 2012, Japan Society for Obstetrics and Gynaecology, Kobe, Japan). Abstracts deriving from this WIRF Capacity Building Grant funded work were awarded a New Investigator Award at the SGI Annual Meeting (San Diego, CA) and a prestigious IS Award at the Japan Society for Obstetrics and Gynaecology Meeting (Kobe, Japan) and a $10,000 NIRIS Award from the Government of Western Australia.

In addition to our core inflammatory based work, this Capacity Building Grant has been used to support:

i) the work of two Ph.D. students (Mr Tom Cox and Dr Li Zhang). Mr Cox, investigating the structural response of the fetal skin to inflammatory insult, has made excellent progress and now has sufficient data to prepare two original manuscripts; and

ii) final structural alterations required to complete the refurbishment of the School of Women's and Infants' Health PC2 laboratories at the Large Animal Facility, facilitating our keratinocyte culture experiments.

In early 2012 we submitted two NHMRC project grant applications, a Raine Medical Foundation Priming Grant application, and a BrightSpark Foundation Fellowship. A significant proportion of the data used in support of these competitive applications derived from research funded by WIRF via this Capacity Building Grant.

On behalf of my colleagues I would like to thank the Foundation for their on-going support and look forward to making a final report in 2013.

we have now published the first three papers describing qualitative and quantitative changes...

Chief Investigator:

Matthew W. Kemp PhD

Research Fellow

UWA School of Women's and Infants' Health

Sheep Research Scientific Manager

WIRF / Lotterywest Perinatal Research Laboratories

IMPROVING PREGNANCY FOR MOTHERS AND BABIES

» THE FOUNDATION IS PROMOTING AND SUPPORTING A WIDE RANGE OF PROJECTS EACH OF WHICH AIMS TO IMPROVE THE OUTCOMES OF PREGNANCY. ADVANCES IN THIS FIELD ARE VITAL AS WE NOW UNDERSTAND THAT THE MONTHS BEFORE BIRTH ARE CENTRAL TO OUR FUTURE HEALTH AND WELL- BEING. INVESTMENT IN THESE EARLY TIMES OF LIFE OFFERS THE GREATEST PROMISE IN IMPROVING THE HEALTH OF INDIVIDUALS AND OUR COMMUNITY AS A WHOLE.

Improving Pregnancy for mothers and babies

THE CYCLE STUDY
Cycling to break the cycle of pregnancy diabetes

» DURING PREGNANCY MANY WOMEN WILL DEVELOP DIABETES. THIS CONDITION IS CALLED GESTATIONAL DIABETES. KNOWING THAT A WOMAN HAS GESTATIONAL DIABETES IS VERY IMPORTANT AND THERE ARE MANY ASPECTS OF CARE OF THE PREGNANCY AND NEWBORN INFANT THAT NEED TO BE CONSIDERED. OF GREATEST IMPORTANCE HOWEVER IS THE FACT THAT POOR BLOOD SUGAR CONTROL DURING A PREGNANCY WITH GESTATIONAL DIABETES PREDISPOSES THE CHILD AND FUTURE ADULT TO OBESITY AND DIABETES, THUS CREATING A VICIOUS CYCLE.

We are now in the midst of a world-wide epidemic of gestational diabetes, fuelling ever increasing problems with obesity and diabetes in later life. Within the course of a single generation, many developing countries have seen the rate of gestational diabetes rise from a few percent to almost a quarter of all pregnancies. A similar increase in rate is seen within Aboriginal Australians.

At this time, treatment of gestational diabetes is based on dietary modification, blood sugar monitoring and insulin injections. We need, however, to find a way to prevent the condition from developing. Our best opportunity comes from exercise. Exercise is known to be able to prevent or minimise diabetes in non-pregnant people, but its role in pregnancy is poorly understood.

In pilot studies we have shown that pregnant women are well-placed to undergo exercise programs and increase their fitness. Our studies were based on swimming. A survey of our population has shown, however, that women at risk of gestational diabetes would prefer to have home-based exercise. We therefore are conducting a large randomised controlled trial in which the intervention is exercise at home using a stationary exercise bicycle, supervised three times each week by a research exercise physiologist. This project is called The Cycle Study and is a collaboration between WIRF researchers and the School of Exercise and Sports Science at The University of Western Australia.

Pregnant women with a history of gestational diabetes in a previous pregnancy are invited to participate. Their risk of a recurrence of the gestational diabetes is approximately 50%. After full assessment, each woman is allocated at random to have supervised exercise at home from 14 to 28 weeks of pregnancy, or to be in the control group. At 28 weeks gestation, all women are then tested for gestational diabetes. Our hypothesis is that the exercise program will have significantly lowered the rate of diabetes, improved blood sugar control, and also may have improved measures of physical and mental well-being.

The study is proceeding as planned. Any women who live in the metropolitan area of Perth, have a history of gestational diabetes and are less than 14 weeks pregnant are welcome to join.

Study Website: **www.thecyclestudy.com.au**

Investigators / Researchers:

WIRF/School of Women's and Infants' Health,
The University of Western Australia

Prof John Newnham MD FRANZCOG

Prof (Adj) Dorota Doherty BSc (Hons) PhD

Clinical Professor Barry Walters FRACP

Cherry Young RN RM

UWA School of Sports Science, Exercise and Health

Associate Prof Kym Guelfi PhD

Prof Paul Fournier

Prof James R Groves PhD

Associate Prof Karen Wallman PhD

Research Associate
Dr Nicole Crisp

MJ Ong

telethon 7

THE UNIVERSITY OF WESTERN AUSTRALIA
Achieve International Excellence

KING EDWARD MEMORIAL HOSPITAL WOMEN & NEWBORN HEALTH SERVICE

THE FETAL FUTURES PROGRAM

Improving Pregnancy for mothers and babies

Investigators:

Prof Jan Dickinson MD FRANZCOG

Mrs Teresa Warner RN RM DMU

Dr Corrado Minutillo FRACP

Prof Graham Hall PhD

Dr Jason Tan MBBS

Dr James Ramsay FRACP

Dr Conor Murray FRANZCR

Dr Emma Harris MBBS FRACP

Dr Madhur Ravikumara MBBS FRACP

Mrs Yvette Williams BSc

Mrs Joan Sharpe M Cardiac Ultrasound, AMS

Dr Susannah Hart PhD

Prof (Adj) Dorota Doherty BSc (Hons) PhD

Ms Liz Nathan BSc

Major Sponsor:

Channel 7 Telethon Trust

ADVANCES IN MEDICAL KNOWLEDGE AND TECHNOLOGY HAVE ENABLED MANY SERIOUS CONDITIONS AFFECTING THE FETUS TO BE RECOGNISED PRIOR TO BIRTH SO THAT INTERVENTIONS IN THE ANTENATAL AND POSTNATAL PERIOD MAY BE PROVIDED TO IMPROVE SURVIVAL RATES. WITH MANY CHILDREN NOW SURVIVING DUE TO THESE PERINATAL STRATEGIES, IT IS IMPORTANT TO REVIEW THEIR OUTCOMES IN THE LONGER TERM. THE FETAL FUTURES PROGRAM COMMENCED IN 2007 AS A JOINT RESEARCH VENTURE BETWEEN THE WOMEN AND INFANTS RESEARCH FOUNDATION AND CHANNEL 7 TELETHON TO ASSESS THE LONG TERM OUTCOMES OF CHILDREN WHO HAVE PROBLEMS IN FETAL LIFE REQUIRING TREATMENTS PRIOR TO DELIVERY OR SOON AFTER BIRTH. OVER THE PAST FIVE YEARS THE FETAL FUTURE MULTIDISCIPLINARY TEAM SUCCESSFULLY COMPLETED TWO LONG TERM FOLLOW-UP STUDIES AND IS CURRENTLY IN THE PROCESS OF COMPLETING A THIRD.

In 2011 a study of the long term outcomes of children born with gastroschisis, a birth defect in the anterior abdominal wall, was completed. The results of this research, presented at the Society for Maternal Fetal Medicine in the USA and the Perinatal Society of Australia and New Zealand in Sydney in 2012, have shown that the general health of children born with gastroschisis was mainly good. Weight, height and blood pressure were within the normal range. Long term development outcomes were also within normal range with IQ consistent with the population average.

Our current research project is to assess the long-term outcomes of children born with congenital diaphragmatic hernia, a very serious birth defect in which the abdominal organs are displaced into the fetal chest due to a defect in the diaphragm. Survival rates for babies born with diaphragmatic hernia have improved, but there is only limited knowledge about how the children cope in the long term. It is predicted that the children may have difficulties with breathing, exercising and eating. The purpose of this current study is to assess the heart and lung function of children who have had a successful repair of their diaphragmatic hernia and their neurodevelopmental outcomes.

The research team of the Fetal Futures Program is grateful to the children and their families who have participated in our studies and to Channel 7 Telethon for their financial support of this research endeavour.

PLACENTAL RESEARCH

Improving Pregnancy for mothers and babies

» THE PLACENTAL RESEARCH GROUP IS HEADED BY PROFESSOR JEFF KEELAN AND CONSISTS OF RESEARCH ASSISTANT PROFESSOR DEMELZA IRELAND, RESEARCH ASSISTANT DR KAMALI PUGAZHENTHI, PHD STUDENT SARMAH NAYEEM, AND MSC STUDENT LISA STINSON. DR GAUTAM KAUL, A VISITING RESEARCHER FROM INDIA ON AN ENDEAVOUR FELLOWSHIP, SPENT SIX MONTHS WITH THE GROUP ESTABLISHING MODELS FOR STUDYING NANOPARTICLE UPTAKE AND TRANSFER IN THE HUMAN PLACENTA.

MAIN AREAS OF STUDY:

- Placental inflammation and premature birth
- Maternal-fetal delivery of antibiotics and anti-inflammatory drugs
- Drug transporters and signaling molecules in the placenta and their role in placental formation and protection
- Wnt signaling in the trophoblast and decidua
- Nanoparticle drug delivery and safety in pregnancy
- Placental adipokines in pregnancies complicated by diabetes and obesity

The group has collaborative links with the Department of Anatomy, Human Biology and Physiology, UWA, the School of Medicine and Pharmacology at Royal Perth Hospital, The Perinatal Research Centre at Melbourne's Royal Women's Hospital, the Centre for Strategic Nano-fabrication, UWA, and the National Center for Nanoscience and Technology in Beijing, China. The group is funded by grants from the NHMRC, the Raine Foundation, Telethon Channel 7 Trust and WIRF.

KEY HIGHLIGHTS

- Recruitment of Drs Pughazhenthi and Ireland from almost 100 applicants
- Graduation of two PhD students, Irving Aye and Ambika Singh
- Establishment of human and ovine placental perfusion systems for drug transfer studies
- Publication of 10 research papers

Chief Investigators & Collaborators:

WIRF/UWA School of Women's and Infants' Health

Prof Jeffrey Keelan, BSc (Hons), MSc, PhD, FSRB

UWA School of Anatomy and Human Biology

Prof Brendan Waddell, BSc (Hons), PhD

Centre for Strategic Nano-fabrication, UWA

Dr Swaminathan Iyer, BE, MS PhD

School of Biomedical Sciences, Curtin University

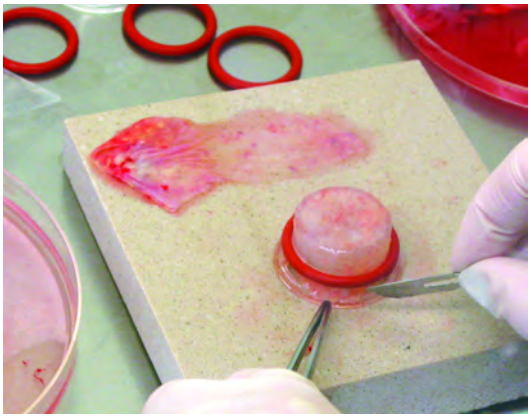
Prof Arunasalam Dharmarajan, BSc, MSc, MMedSci, PhD

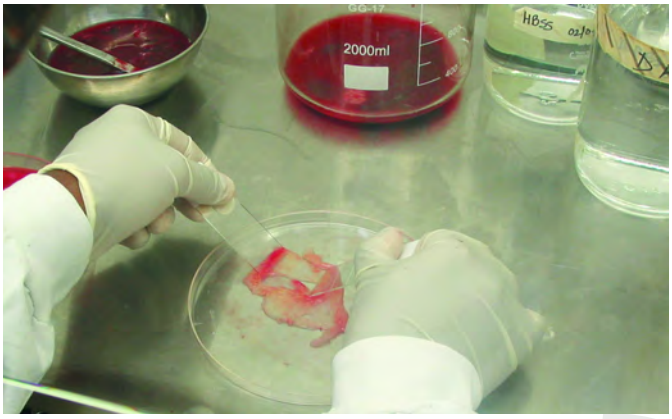
UWA School of Medicine and Pharmacology (Royal Perth Hospital Unit)

Associate Prof Trevor Mori, BSc (Hons), PhD

National Center for Nanoscience and Technology, Beijing, China

Prof Guangjun Nie, BSc, MSc, PhD, Prof of Nanobiomedicine





Improving Pregnancy for mothers and babies

THE DEPARTMENT OF ANAESTHESIA AND PAIN MEDICINE FOCUSES ON RESEARCH IN THE AREAS OF IMPROVING THE EXPERIENCE AND SAFETY OF PREGNANT WOMEN HAVING OPERATIONS, ON DELIVERY OF OPTIMAL PAIN RELIEF TO WOMEN DURING LABOUR AND AFTER SURGERY, AND ON THE SAFETY OF MEDICATIONS USED BY WOMEN WHO ARE ESTABLISHING LACTATION AND BREASTFEEDING.

Chief Investigators:

Prof Michael Paech DRCOG FRCA FFPMANZCA FANZCA FRANZCOG (Hon) DM

Clinical Associate Prof Nolan McDonnell FANZCA MClinRes

Dr Chris Mitchell FANZCA

Researchers / Investigators:

Dr Melanie Bloor FRCA

Dr Twain Russell FANZCA

Clinical Associate Prof Tomas Corcoran FJFICM DM

Emeritus Prof Ken Ilett PhD

Liz Nathan BSc Grad Dip (Biostat)

Research Midwives/Assistants:

Desiree Cavill RN RM

Tracy Bingham RN RM

Dr Yayoi Ohashi

Dr Patchareya Nivatpunim

Mr Michael Mui MBBS

Mr Hakeem Taufiq

Major Sponsors:

The Australian and New Zealand College of Anaesthetists

Women and Infants Research Foundation

Pfizer Australia

The Australian Society of Anaesthetists

Allied Medical Pty Ltd

RESEARCH HIGHLIGHTS

This year our study of the optimum drug doses to treat falls in blood pressure after anaesthesia for caesarean delivery was completed and is described below. We have published articles on the transfer of drugs into breast-milk (showing that a commonly used anti-inflammatory pain reliever is safe) and review articles on the use during pregnancy of the strong pain reliever tramadol. We published the results of a multicentre international study on a treatment called a "blood patch" to stop severe headache that can be a complication of an epidural – this study started in 2004!

We have continued our studies of dexamethasone, a steroid drug widely used to prevent nausea and vomiting after surgery, to see if it has adverse effects on important cells that fight infection; a study of simple pain-killers like "Panadol" to see if they are worth giving routinely to women who have minor gynaecology operations; and of a new drug that rapidly reverses the paralysing effects of drugs used during anaesthesia (the original being curare). We started new studies on the value of intravenous methadone for pain relief after surgery; of the needles used to block nerves in the abdominal wall, under ultrasound guidance, for pain relief after operations on the lower abdomen; and of a new drug used to treat constipation (methylnaltrexone), to see if it prevents itchiness resulting from spinal morphine (which is often given to control pain after a caesarean delivery).

STARTER GRANT: *Dose equivalence of metaraminol and phenylephrine to prevent hypotension from spinal anaesthesia for caesarean delivery.*

This clinical pharmacology trial has been completed and results are being analysed. The patients were each given one of two powerful drugs that increase blood pressure, which is necessary to counteract the fall in blood pressure that occurs in response to a spinal anaesthetic in a pregnant woman. These types of drugs can stop the mother becoming nauseous or faint and the baby from becoming deprived of oxygen from the placenta just before birth. The study determined the potency ratio of the two drugs so that this information will be used in a new study we are planning, to see if the drugs are similar in producing a good outcome for the baby at caesarean delivery.

ROLE OF UMBILICAL CORD BLOOD GAS AND LACTATE ANALYSIS IN PERINATAL CARE

A BABY'S BLOOD GAS MEASUREMENT IS WIDELY RECOGNISED AS THE BEST METHOD TO IDENTIFY ASPHYXIA AT BIRTH. IN 2002, UMBILICAL CORD GAS SCREENING WAS INTRODUCED FOR ALL BIRTHS AT KING EDWARD MEMORIAL HOSPITAL FOR WOMEN. A RECENT STUDY OF ALL BIRTHS BETWEEN 2003 AND 2008, CONDUCTED BY OUR GROUP, HAS FOUND MARKED IMPROVEMENTS IN OUTCOMES OVER THIS TIME. BLOOD GAS RESULTS HAVE IMPROVED OVER THIS TIME; FEWER BABIES HAVE GASES INDICATIVE OF SEVERE ASPHYXIA AND FEWER BABIES ARE BEING ADMITTED TO THE SPECIAL CARE NURSERIES FOR SIGNS OF BIRTH ASPHYXIA. WE HAVE SUGGESTED THAT THE IMMEDIATE AVAILABILITY OF OBJECTIVE MEASUREMENTS OF NEWBORN WELL-BEING MAY BE PARTIALLY RESPONSIBLE FOR THESE IMPROVEMENTS.

HIGHLIGHTS AND OUTCOMES

Until recently, universal cord gas screening had only been introduced to KEMH, which is a specialised obstetric hospital. It was not known whether introducing this technology to other less specialised hospitals would result in similar improvements. The current project is in the final stages of investigating the impact of introducing measurement of cord blood gas and lactate levels at delivery into metropolitan and regional obstetric units throughout Western Australia. Further, we are seeking to develop a greater understanding of how best to introduce such a program into maternity units and to determine the costs and benefits of using this technology at all births.

Currently, the project is focussing on a number of key areas associated with cord blood gas and lactate analysis and utilisation. Firstly, we have compared umbilical cord blood gas and/or lactate values with traditional measurements such as the Apgar scores in order to predict early adverse neonatal outcomes. Following on from this, we have developed a number of simple and effective methods of predicting adverse neonatal outcomes that can be easily and rapidly applied to identify babies who could benefit from the emerging neuroprotective therapies.

Secondly, we have completed and published a study, which has identified the optimal manner to collect and store umbilical cord blood prior to analysis in order to minimise changes in blood gas and lactate values. Thirdly, we have conducted the first economic evaluation of the costs associated with the introduction of universal umbilical cord blood gas analysis. The costs of umbilical cord blood gas analysis have been compared with the potential savings associated with the reduction in neonatal nursery admissions noted to follow introduction of universal analysis, with the savings found to have exceeded the costs.

Work resulting from this project has been presented at a number of local, national, and international clinical and academic conferences in Australia, Canada and the United States of America. Additionally, publications associated with this project have been published in the Australian and New Zealand Journal of Obstetrics and Gynaecology, British Journal of Obstetrics and Gynaecology, Journal of Maternal, Fetal and Neonatal Medicine as well as in the Thirteenth Perinatal Morbidity and Mortality Report of Health Department, Western Australia.

Chief Investigators:

Mr Christopher White BMedSci

Associate Prof Craig Pennell PhD FRANZCOG CMFM

Associate Prof Paul McGurgan MB BCh FRANZCOG

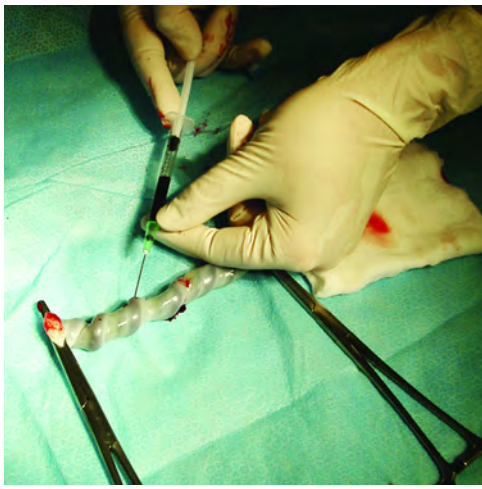
Prof (Adj) Dorota Doherty BSc (Hons) PhD

Prof John Newnham MD FRANZCOG CMFM

Major Sponsors:

Western Australian Department of Health

The University of Western Australia



FAMILY VASCULAR RISK FACTORS IN THE PREDICTION OF PRE-ECLAMPSIA

Improving Pregnancy for mothers and babies

PRE-ECLAMPSIA IS A SERIOUS COMPLICATION OF PREGNANCY, CAUSING INCREASED PERINATAL AND MATERNAL MORBIDITY AND MORTALITY. IT AFFLICTS 5-6% OF PREGNANCIES IN WA AND IS RESPONSIBLE FOR APPROXIMATELY 15-20% OF PRETERM BIRTHS. THE INCIDENCE OF THE CONDITION IS HIGHER IN FIRST TIME PREGNANCIES (APPROXIMATELY 10%). AS THERE IS NO PRIOR PREGNANCY HISTORY IN NULLIPAROUS WOMEN TO INFORM THE RISKS OF DEVELOPING PRE-ECLAMPSIA, WE BELIEVE IT IS IMPORTANT THAT THIS GROUP BE LOOKED AT IN DETAIL.

Pre-eclampsia is characterised by hypertension, endothelial damage, activation of inflammatory pathways and activation of coagulation pathways. These disturbances are associated with impaired placental perfusion and often poor fetal growth with an increased risk of stillbirth, abruption of the placenta and maternal complications related to severe hypertension and widespread vascular damage.

The cause of pre-eclampsia is unknown. It is likely that there is no single cause and that the disorder may result from a variety of predisposing states. Major contributors are hypertension, renal disease, autoimmune disorders, thrombophilic states and multiple pregnancy.

Women who have had a previous pregnancy complicated by high blood pressure or pre-eclampsia, may be at increased risk of these problems in future pregnancies and can be monitored accordingly. Women who have not yet had a baby, will not know if they have some of these risk factors and so we need to look at the information that is available. To this end, we are asking women and their partners about their cardiovascular health history in particular as well as that of their parents and siblings.

During routine antenatal appointments we asked over 1000 first-time mothers and their partners, a series of questions about their family health history. After delivery we are collecting pregnancy and birth outcomes. A database is being used to assess any relationships found. This study will interrogate the hypothesis that the risk of pre-eclampsia and associated pregnancy complications relate to family history of cardiovascular disease in the pregnant woman and her partner. We believe the medical history of the father of the baby may additionally inform the prediction of the incidence of pre-eclampsia in the mother. The project is currently in the analysis phase and will be completed late this year.

OTHER RESEARCH

Our collaborations with groups of international researchers are continuing with advances being made towards better prediction of the progression of pre-eclampsia during individual pregnancies.

Investigators:

School of Women's and Infants' Health, The University of Western Australia

Clinical Associate Prof Barry NJ Walters, FRACP

Claire Parker BSc (Masters by Research candidate)

Prof (Adj) Dorota Doherty BSc (Hons) PhD

Dr Natalie Oud, MBBS

Major Sponsor:

Pfizer Australia

L-R: Dorota Doherty, Claire Parker, Natalie Oud, Barry Walters

» THE USE OF ALCOHOL, TOBACCO AND ILLICIT DRUGS, SUCH AS CANNABIS, AMPHETAMINE AND HEROIN IN PREGNANCY IS A MAJOR HEALTH CONCERN. APPROXIMATELY HALF OF AUSTRALIAN WOMEN IN COMMUNITY SURVEYS REPORTED ALCOHOL AND/OR OTHER DRUG USE IN PREGNANCY. OFTEN PEOPLE USE MORE THAN ONE DRUG, USUALLY REFERRED TO AS POLY DRUG USE. DRUG-USING WOMEN ARE AT RISK OF SUFFERING A RANGE OF ADVERSE EFFECTS INCLUDING SPONTANEOUS ABORTIONS, HYPERTENSION, PLACENTA ABRUPTION, MECONIUM STAINED AMNIOTIC INFECTION, PRECIPITOUS AND PRE-TERM BIRTHS AND INFECTIONS SUCH AS HEPATITIS C AND HIV. IN THE DEVELOPING FETUS, DNA AND RNA REPLICATION MAY BE AFFECTED REDUCING HEAD CIRCUMFERENCE, GROWTH AND BIRTH WEIGHT.

Other adverse effects include prematurity, still birth, and neonatal abstinence symptoms. Many pregnancies are unplanned. Unplanned pregnancy has the potential to increase the incidence of postnatal psychological morbidity and affect mother/baby interactions. While there is evidence of the progress of illicit drug using women during the antenatal period and delivery, little is known about the postnatal outcomes of the mothers and infants.

Children whose parents engage in risky alcohol or illicit drug use have an increased risk of later problem behaviour, social isolation and stigma. Relationships between parents and their children are more likely to be difficult and inconsistent, possibly providing inconsistent and 'lukewarm care', ineffective supervision and overly punitive discipline. Households where there is risky alcohol or illicit drug use are more likely to be poor, unstable and chaotic environments. The tensions between good parenting and risky alcohol or drug use may be acute in economically deprived households where there is little or no social support from relatives, friends or neighbours.

This study is the first to comprehensively monitor substance use of women and partners from early pregnancy to one year post partum.

RESEARCH HIGHLIGHTS

Currently we are engaged collaboratively in a longitudinal birth cohort study of 1800 families: The Impact of Parental Substance Use on Infant Development and Family Functioning (the Triple B Study; Babies, Bumps and Beyond). The study is supported by NHMRC and is designed to examine the effects of substance use on infant development and family functioning. This study is noteworthy as, where possible, we are including the mothers and their partners. There is little knowledge available on the nature and impact of partners' substance use in pregnancy.

OUTCOMES

Pregnant women and their partners are being recruited from King Edward Memorial Hospital in Perth and three hospitals in Sydney (Prince Alfred, Royal Hospital for Women, and Liverpool Hospital). In addition it is anticipated that recruitment will also commence shortly at Westmead Hospital.

To date over 1300 families have been recruited; over 200 in Western Australia. This study is the first to comprehensively monitor substance use of women and partners from early pregnancy to one year postpartum and the effects of this on the infant's development in this important time.

Improving Pregnancy for mothers and babies

COLLABORATING CENTRES

The main collaborating centres and institutes are the National Drug and Alcohol Research Centre, University of New South Wales, National Drug Research Institute, Curtin University, Queensland Alcohol and Drug Research and Education Centre, Murdoch Childrens' Research Institute and the hospitals concerned.

Chief Investigators:

Western Australia

Prof Steve Allsop PhD
National Drug Research Institute
Curtin University

Prof Anne Bartu PhD FRCNA
School of Nursing and Midwifery
Curtin University

Dr Dale Hamilton FRANZCOG
King Edward Memorial Hospital

Ms Aurora Popescu BSc Psych
Curtin University

New South Wales

Prof Richard Mattick PhD
National Drug and Alcohol
Research Centre
University of New South Wales

Dr Delyse Hutchinson PhD
National drug and Alcohol
Research Centre
University of New South Wales

Dr Lucy Burns PhD
National Drug and Alcohol
Research Centre
University of New South Wales

Prof Elizabeth Elliott
Childrens Hospital Westmead
University of Sydney

Major Sponsor:

National Health and Medical
Research Council

(L-R) Dale Hamilton, Renata McLaurin, Angela O'Connor, Dr Trupti Sharma, Dr Ray Binns, Dr Katrina Calvert, Erica McKinnon, Dr Carolyn Haeusler, Gemma Davies. Absent: Prof Anne Bartu

(L-R) Dr Steve Allsop, Candice Rainsford, Aurora Popescu

Improving Pregnancy for mothers and babies

» ABORIGINAL WOMEN EXPERIENCE POORER MATERNAL OUTCOMES COMPARED TO NON-ABORIGINAL WOMEN, AND THEIR NEWLY BORN BABIES OFTEN HAVE POORER OUTCOMES WHICH MAY CONTINUE INTO CHILDHOOD. FOR ABORIGINAL WOMEN, IMPROVING THEIR ACCESS TO QUALITY CARE IN THE ANTENATAL AND POSTNATAL PERIODS IS A KEY PART TO CLOSING THE GAP IN PREGNANCY OUTCOMES BETWEEN ABORIGINAL AND NON-ABORIGINAL AUSTRALIANS.

Every year around 1,800 Aboriginal women give birth in Western Australia. These mothers represent 6.5% of all Western Australian women who give birth each year with 65% of these women living outside metropolitan Perth.

Aboriginal women are often at high risk of pregnancy complications and require specialist obstetric care available only in tertiary hospitals like King Edward Memorial Hospital in Perth. Fifty four percent of Aboriginal women residing in metropolitan Perth and 17% of Aboriginal women residing in rural or remote Western Australia give birth at King Edward Memorial Hospital in Perth.

BETTER HEALTH WITH ABORIGINAL HEALTH WORKERS AT KING EDWARD MEMORIAL HOSPITAL

Improving Pregnancy for mothers and babies

CLOSING THE GAP IN PERINATAL OUTCOMES BETWEEN ABORIGINAL AND NON-ABORIGINAL WOMEN REQUIRES IMPROVEMENTS IN THE QUALITY OF ANTENATAL AND POSTNATAL CARE FOR ABORIGINAL WOMEN. CURRENT NATIONAL STRATEGIES DESIGNED TO IMPROVE PERINATAL OUTCOMES FOR ABORIGINAL WOMEN AND BABIES EMPHASISE ACCESS TO PRIMARY MATERNITY CARE THAT IS OFTEN PROVIDED WITH THE SUPPORT OF ABORIGINAL HEALTH WORKERS. OUR STUDY AIMS TO EXTEND NATIONAL STRATEGIES BY INTRODUCING ABORIGINAL HEALTH WORKERS INTO SPECIALIST TERTIARY HOSPITAL CARE TO IMPROVE CULTURAL SAFETY AND ACHIEVE BETTER OUTCOMES FOR ABORIGINAL MOTHERS AND THEIR BABIES.

Investigators:

WIRF/UWA School of Women's and Infants' Health, UWA

Prof (Adj) Dorota Doherty BSc (Hons) PhD

Prof John Newnham MD FRANZCOG

Dr Janet Horbuckle MB ChB MRCOG FRANZCOG

Prof Karen Simmer MBBS FRCPCH

King Edward Memorial Hospital/Aboriginal Maternity Services Support Unit

Assoc Prof (Adj) Graeme Boardley RN RM BHlthSc (Hons) MN

Ms Anne-Marie McHugh RN RM BHlthSc (Midwifery)

Aboriginal Health Council of Western Australia

Ms Sharon Bushby BAppSc (Indigenous Community Health) MPH

The Combined Universities Centre for Rural Health (CUCRH)

Assoc Prof Ann Larson BA MA PhD

Geraldton Regional Aboriginal Medical Service (GRAMS)

Ms Rhonda Bradley RN RM

Major Sponsor:

National Health and Medical Research Council

The benefits of involving Aboriginal Health Workers in the provision of pregnancy care in the mainstream hospital setting are unknown, as currently Aboriginal Health Workers do not take part in the provision of pregnancy care at tertiary hospitals. This study will evaluate the role of Aboriginal Health Workers in supporting pregnancy care in the non-primary setting and to define the best model of care for Aboriginal women at high risk of pregnancy complications.

The study is designed as a pre-intervention and post-intervention trial to assess the benefits of the introduction of Aboriginal Health Workers and to evaluate their role in supporting the pregnancy care for pregnant Aboriginal women who attend King Edward Memorial Hospital.

We will assess the benefits of pregnancy care supported by Aboriginal Health Workers and determine the best way for this introduction. This will be done by comparing standard tertiary care (before Aboriginal Health Workers are introduced at the hospital) to the care supported by Aboriginal Health Workers (after Aboriginal Health Workers are introduced at the hospital). Aboriginal women receiving antenatal care at King Edward Memorial Hospital will be recruited either before or after the introduction of Aboriginal Health Workers into the hospital. We aim to recruit approximately 220 women into each of the two groups.

Once all women are recruited and followed up until their babies are 4 months of age, we will compare the outcomes between the women who received standard hospital care and the women who received care with the assistance of the Aboriginal Health Workers. We will then determine if improvements were achieved with regard to access and engagement with care, quality and satisfaction with care and clinical effectiveness. The knowledge and understanding gained in the study will be used to develop new and more effective strategies of engaging Aboriginal women in their antenatal care in a tertiary setting to further improve pregnancy outcomes and assist in effective transition and access to child health services.

BETTER HEALTH with ABORIGINAL HEALTH WORKERS STUDY

ABORIGINAL MATERNITY SERVICES SUPPORT UNIT WOMEN & NEWBORN HEALTH SERVICE

MATERNITY CARE FOR ABORIGINAL WOMEN IN NON-METROPOLITAN WESTERN AUSTRALIA

Improving Pregnancy for mothers and babies

EVIDENCE FROM MANY STUDIES DEMONSTRATES THAT MORE FREQUENT ANTENATAL VISITS LEAD TO BETTER PREGNANCY OUTCOMES. ABORIGINAL WOMEN DO NOT ATTEND THEIR PREGNANCY CARE AS OFTEN AS NON-ABORIGINAL WOMEN, AND IMPROVING ACCESS TO ANTENATAL CARE IN ABORIGINAL COMMUNITIES HAS BEEN SHOWN TO DECREASE THE RATES OF PRETERM BIRTH, LOW BIRTH WEIGHT AND NEONATAL MORTALITY. NEW INITIATIVES TO IMPROVE MATERNITY CARE TAILORED TO THE NEEDS OF ABORIGINAL WOMEN ARE BEING INTRODUCED AND EVALUATED.

The aim of this project is to: Assess the economic implications of poor access to antenatal care in rural and remote Aboriginal communities; to evaluate pregnancy outcomes and resources used in the delivery of pregnancy care in rural and remote Western Australia for the traditional maternity care and community-based midwifery lead model; and to evaluate the pregnancy outcomes and their regional variations for Aboriginal women in Western Australia.

We evaluated pregnancy outcomes and the cost of pregnancy care, associated with either poor or adequate access to antenatal care, and with either standard or midwifery-augmented antenatal care, by simulating two large hypothetical pregnancy cohorts where antenatal complications and pregnancy outcomes were influenced by the maternal characteristics, current gestational age and events in pregnancy. Our simulated pregnancy cohorts closely resembled the pregnancy outcomes observed in Western Australian Aboriginal non-metropolitan women, and it accurately reflected pregnancy outcomes overall, and within each region of Western Australia. These hypothetical pregnancy cohorts were used to estimate pregnancy outcomes and their associated costs for both comparisons, poor or adequate care, irrespective of the model of maternity care, and for the standard or augmented model of maternity care.

Poor access to maternity care is associated with a considerable increase in the average cost of pregnancy care. The introduction of additional elements of maternity care that improve antenatal attendance, such as assistance by the Aboriginal Health Workers or Midwives, leads to improvements in pregnancy outcomes at small or negligible additional cost. These improvements can be achieved because the increased frequency of antenatal visits provide more opportunity to identify and treat pregnancy problems and thereby reducing the likelihood of a baby being born prematurely or having low birthweight.

Our assessment of the economic consequences of poor access to antenatal care demonstrates that policies to improve access to care are likely to be cost-effective and lead to improved pregnancy outcomes. Our evaluation method which uses data modelling techniques to generate a hypothetical pregnancy cohort, permits investigation into the balance of risks and benefits of the alternative models of maternity care without actual real time implementation. Data collection in an actual pregnancy cohort under the proposed alternative model of care would be costly and require a long time to implement.

Investigators:

WIRF/UWA School of Women's and Infants' Health, UWA

Prof (Adj) Dorota Doherty BSc (Hons) PhD

Dr Janet Horbuckle MB ChB MRCOG FRANZCOG

Prof Karen Simmer MBBS FRCPCH

Prof John Newnham MD FRANZCOG

Mr Jeffrey Cannon BSc (Hons) BBus

The Combined Universities Centre for Rural Health (CUCRH)

Melissa Barrett RN RM MSci (Nursing)

Assoc Prof Ann Larson BA MA PhD

Prof Isabelle Ellis RN RM MPHTM PhD

Geraldton Regional Aboriginal Medical Service (GRAMS)

Ms Rhonda Bradley RN RM

Ms Cindy Porter BSci (Hons) MSci (Diabetes Education) PhD Candidate

Dr Charlie Greenfield MBBS PhD FACP

Department of Health Western Australia

Mr Gerard Montague BEc Grad Dip Bus Fin

Major Sponsor:

State Health Research Advisory Council, WA Department of Health

Dorota Doherty

Janet Hornbuckle

Ann Larson

Melissa Barrett

Jeffrey Cannon

John Newnham

Karen Simmer

Glenda Taylor

MOTHER'S ANXIETY STUDY

Improving Pregnancy for mothers and babies

THE MOTHER'S ANXIETY STUDY AIMS TO DEVELOP A VALID AND RELIABLE SELF-REPORT SCALE TO SCREEN FOR PROBLEMATIC ANXIETY DURING PREGNANCY AND POSTNATALLY (I.E., DURING THE PERINATAL PERIOD).

Anxiety disorders are as common as depression in the perinatal period, with a prevalence of up to 17%. High, untreated anxiety during the perinatal period has been found to affect the physical and psychological health of the mother and physical, cognitive and emotional development of the baby. Early effective detection of problematic anxiety in pregnancy and postnatally is crucial to enable early intervention and referral for treatment that may improve outcomes for mother and child. Developing a screening scale for clinically problematic anxiety in pregnant and postnatal women is a world-first.

Research highlights: The Perinatal Anxiety Screening Scale (PASS) has been developed by the research team based on clinical experience, a review of existing anxiety scales and input from women in the community. This work has been presented at a national conference in 2011 and is due to be presented internationally at a conference in September, 2012.

Phase One of the project, which was completed recently, examined the acceptability and how well the PASS works in an antenatal community hospital sample. 280 women attending routine antenatal appointments at King Edward Memorial Hospital participated in the study by completing the PASS and other general population measures of anxiety and depression. Results showed the PASS to be correlated with other measures of anxiety and very acceptable to the women in this sample.

Phase Two of the project has recently commenced, which aims to further validate the PASS on a clinical sample of perinatal women with diagnosed mental health issues by determining whether the PASS is a useful tool to detect problematic anxiety and the type of anxiety. Perinatal women are currently being recruited from Psychological Medicine at KEMH and their PASS scale responses compared with their mental health diagnoses after a clinical assessment.

The availability of an acceptable, reliable, valid tool to screen for problematic anxiety in perinatal women will significantly add to the current best practice screening for perinatal depression using the Edinburgh Postnatal Depression Scale by being able to detect problem anxiety which is just as common a problem as depression with far reaching potential risks for the health of mother and child.

Chief Investigator:

Susanne Somerville B. Psych M.Psych (Clinical)

Researchers:

Rosemary Hagan BA (Hons) M.Psych (Clinical)

Kellie Dedman BA (Hons) M.Psych (Clinical/Health)

Elizabeth Oxnam BA B.Psych M.Psych (Counselling)

Prof (Adj) Dorota Doherty BSc (Hons) PhD

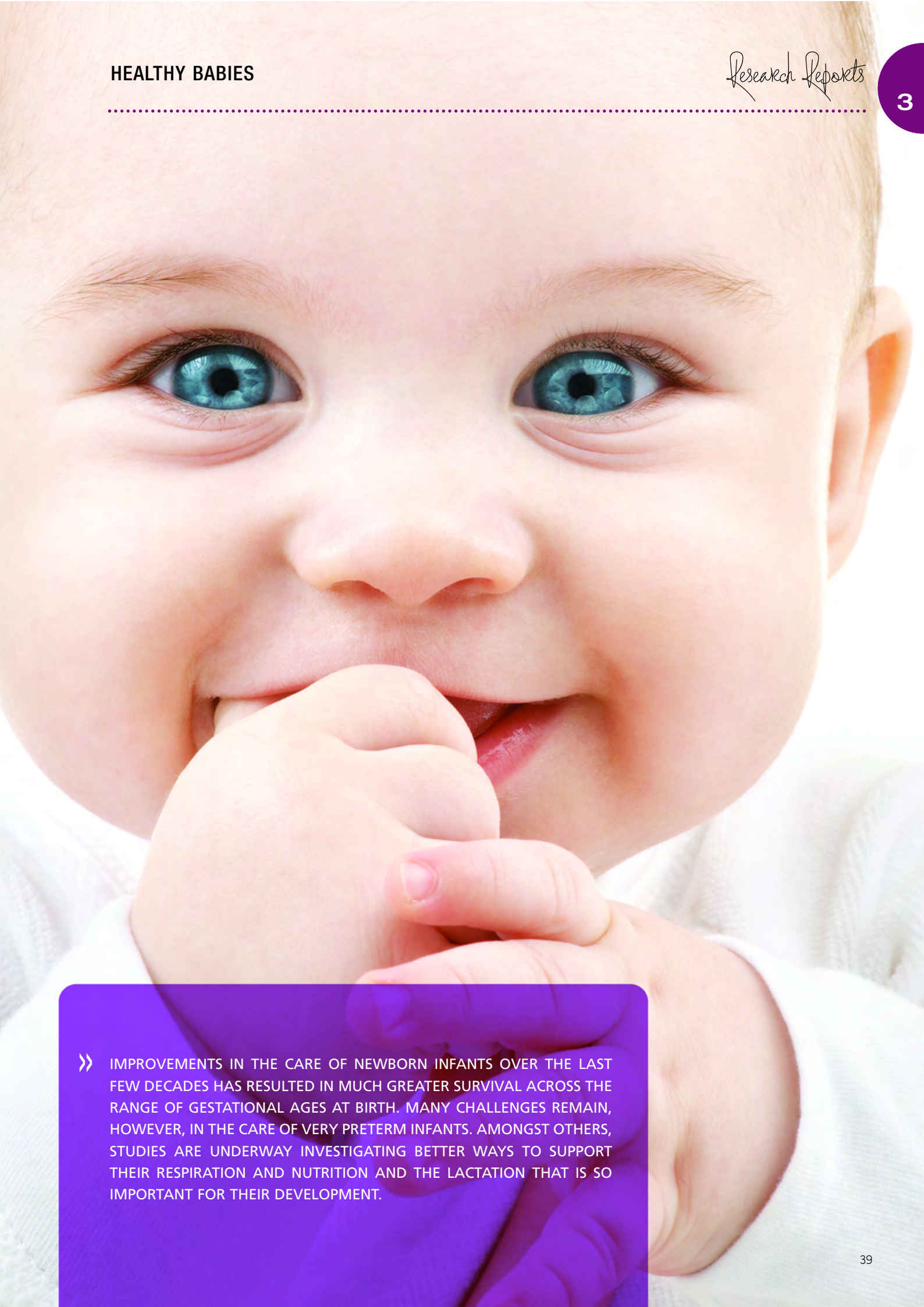
Sol Coo-Calcagni B. Psych M.Psych. PhD Candidate Univ Melbourne

Shannon Byrne BSc (Hons) M.Psych (Clinical) PhD Candidate

Major Sponsor:

Channel 7 Telethon Trust

L-R: Rosemary Hagan, Shannon Byrne, Soledad Coo-Calcogni, Kellie Dedman, Sue Sommerville



» IMPROVEMENTS IN THE CARE OF NEWBORN INFANTS OVER THE LAST FEW DECADES HAS RESULTED IN MUCH GREATER SURVIVAL ACROSS THE RANGE OF GESTATIONAL AGES AT BIRTH. MANY CHALLENGES REMAIN, HOWEVER, IN THE CARE OF VERY PRETERM INFANTS. AMONGST OTHERS, STUDIES ARE UNDERWAY INVESTIGATING BETTER WAYS TO SUPPORT THEIR RESPIRATION AND NUTRITION AND THE LACTATION THAT IS SO IMPORTANT FOR THEIR DEVELOPMENT.

NEONATAL RESPIRATORY MEDICINE AND PHYSIOLOGY

» THE NEONATAL RESPIRATORY RESEARCH GROUP AIMS TO UNDERSTAND THE GROWTH AND DEVELOPMENT OF THE LUNG AND THE SYSTEMS CONTROLLING BREATHING AFTER PRETERM BIRTH. WE ALSO AIM TO LEARN MORE ABOUT THE FACTORS THAT CAUSE LUNG INJURY IN THE NEONATAL PERIOD AND TO INVESTIGATE NEW TREATMENTS FOR NEWBORN LUNG DISORDERS WITH THE GOAL OF MINIMISING LUNG INJURY AND FINDING WAYS TO OPTIMISE THE LONG TERM RESPIRATORY HEALTH AND WELL-BEING OF PREMATURE BABIES.

Key Highlights:

Completed a randomised controlled trial of Nebulised Surfactant for treatment of Preterm Infants with Respiratory Distress

Award of PhD for Dr Gabrielle Musk (Studies on **High-Frequency Jet Ventilation** in Preterm Lambs with Respiratory Distress Syndrome)

Submission of PhD (Ms Kara Logie – Respiratory Follow-Up of Children Born Preterm)

14 publications over the last 12 months

Submission of 3 project grants to the NHMRC

A major clinical research achievement in 2011-12 was the completion of a randomised controlled trial to investigate whether nebulised surfactant can be safely and effectively delivered to premature babies to treat their respiratory distress syndrome. Surfactant is a detergent like substance that makes it easier to breathe – but low levels of surfactant in the air cells is a prominent feature of many breathing diseases in newborn babies and leaves them especially vulnerable to lung collapse. We were particularly interested in whether using this approach will allow us to avoid the routine but more invasive approach to giving surfactant treatment which involves putting a tube into the windpipe and using a ventilator to deliver breaths to the baby. We showed that in infants between 29 weeks and 34 weeks gestation, nebulised surfactant almost halved the need for positioning of a breathing tube into the windpipe (intubation) and assisted breathing from a machine. Importantly, in the group born between 32 and 34 weeks gestation, the relative risk of intubation in infants receiving nebulised surfactant dropped to nearly 1/10th of the control group. The reduction in intubation with nebulised surfactant will dramatically change the way that babies with breathing problems are treated around the world. Importantly, this new treatment may prevent babies from being unnecessarily separated from their parents when they are born in hospitals that are distant to major referral centres.

(Image courtesy of The Sunday Times)

Dr Gabby Musk was awarded her PhD on the use of the high frequency jet ventilator in the treatment of neonatal respiratory distress syndrome. An especially exciting outcome of her work is the successful introduction of the jet ventilator to clinical practice. This was made possible at King Edward Memorial Hospital through the generous donation of two Life Pulse high-frequency jet ventilators via the Angel Breath campaign conducted by WIRF in partnership with United Community Foundation, The ABN Foundation and the community. The jet ventilator has already saved the lives of critically ill babies.

We are also well into two NHMRC grants awarded for 2011-3. The first of these NHMRC grants is investigating the impact of high-frequency oscillatory ventilation (HFOV) on the preterm airway. Although we know that HFOV protects the lung tissue from injury because it delivers such small breaths, the effect of the waveform on the airway is unknown. We have hypothesised that just as turbulent flow in arteries can cause injury and the formation of atherosclerotic plaques, the turbulent flow in the large airways during HFOV may cause injury that promotes collapse of the windpipe and which may lead to increased dependence on mechanical support for breathing.

A second NHMRC grant is investigating the effect of antenatal infection and maternal steroid treatment on the development of the preterm diaphragm. Both of these fetal exposures appear to weaken the diaphragm, and may predispose the preterm infant to an inability to sustain spontaneous breathing following transition to postnatal life. In separate studies we have commenced assessing the role of Vitamin A in preventing diaphragm atrophy associated with premature birth and prolonged mechanical ventilation.

Baird Family
(Image courtesy of The Sunday Times)

Chief Investigators:

Prof Jane Pillow PhD FRACP

Researchers:

Dr Stefan Minocchieri MD

Dr Yong Song MD

Dr Clare Berry BSc (Hons) PhD

Ms Tina Lavin BSc (Hons)

Students:

Dr Gabby Musk BSc PhD

Ms Karla Logie

Major Sponsors:

Women and Infants Research Foundation

Raine Foundation, UWA

Chiesi Pharma

Pari

Fisher & Paykel Healthcare

National Institutes of Health

National Health and Medical Research Council

SHRAC

NEONATAL NUTRITION – PANTS TRIAL

» THIS TRIAL EVALUATED THE EFFICACY OF A PROBIOTIC (FRIENDLY BACTERIA IN THE GUT THAT ARE BENEFICIAL TO THE HOST) SUPPLEMENT IN COLONISING THE GUT (ASSESSED BY STOOL CULTURES) IN PREMATURE BABIES BORN AT GESTATION UNDER 33 WEEKS. THE OTHER OUTCOME OF INTEREST WAS TOLERANCE TO THE SUPPLEMENT (ABDOMINAL DISTENSION, VOMITING, AND DIARRHEA).

"Probiotic supplementation for reducing mortality and definite necrotising enterocolitis in preterm very low birth weight neonates - A randomised controlled pilot trial"

(Registration number: 1649/EW)

Chief Investigator:

Prof Sanjay Patole MD FRACP
Department of Neonatal Paediatrics, KEMH

Co-investigators:

Prof Karen Simmer

Prof Patricia Conway

Prof (Adj) Dorota Doherty
BSc (Hons) PhD

Major Sponsor:

Channel 7 Telethon Trust

Probiotics are the live beneficial microorganisms that are naturally present in the digestive tract. These friendly bacteria promote health by suppressing the growth of potentially harmful bacteria, improving immune function, and enhancing the protective barrier of the gut.

Death, diseases like necrotising enterocolitis (NEC- a condition with a gangrenous bowel), and feeding difficulties due to immature bowel function are a major problem in premature babies. We have analysed the data from 17 trials involving 3147 premature babies born under 33 weeks, and showed that probiotic supplementation reduced the risk of death and NEC by nearly 50% and 60% respectively. The time to achieve full milk feeds was also significantly less in babies receiving probiotic supplement.

We have successfully completed the clinical trial (PANTS trial) of the probiotic Bifidobacterium breve M16V (Morinaga Industries, Japan) in 150 premature babies. The probiotic supplement was well tolerated by all babies enrolled in the trial. The laboratory results (stool cultures) also confirmed that the strain was able to colonise the gut. We are now moving forward to the introduction of routine probiotic supplementation with Bifidobacterium M16 V for premature babies in our nursery. This will be a landmark achievement in the history of Australian neonatology.

» THE HUMAN LACTATION RESEARCH GROUP (HLRG) IS UNIQUE IN THAT IT HAS A DIVERSE SKILL BASE THAT ENABLES THE DESIGN OF COMPLEX STUDIES THAT COMBINE BREASTMILK ANALYSIS WITH PHYSIOLOGICAL MEASURES OF BREASTFEEDING PROVIDING A COMPREHENSIVE UNDERSTANDING OF HUMAN LACTATION.

In recognition of his immense contribution to science and the community Lead Investigator Winthrop Professor Peter Hartmann head of the HLRG received the honour of a Member of the Order of Australia in 2012.

RESEARCH HIGHLIGHTS

- Pain during breastfeeding has a significant impact on other areas of women's lives
- Mimicking features of breastfeeding in a novel teat results in similar regulation of suck-swallow-breathe coordination
- Simultaneous breast expression is more effective and efficient than sequential breast expression

Pain during breastfeeding is cited as one of the most common reasons for premature weaning of the infant. Despite this little investigation has been carried out into the impact that this has on the mother's wellbeing. PhD student Holly McClellan carried out a systematic assessment of women experiencing both acute and chronic pain and found that pain affected other areas of their life including mood, general activity and sleep. The methods she used to measure pain have the potential to be employed in assessing and monitoring women when an intervention is implemented to resolve the pain.

An understanding of the physiology of breastfeeding is integral to assisting mothers who are experiencing breastfeeding difficulties yet the function of the tongue and coordination of sucking, swallowing and breathing is still poorly understood. PhD student Vanessa Sakalidis has demonstrated that when vacuum was required for milk removal from a teat (as with breastfeeding) suck, swallow, breathe patterns, oxygen saturation and heart rates were similar to breastfeeding. This indicates that likening bottles' teats to mimic breastfeeding more closely will improve infant physiological stability.

Dr Jacqueline Kent was provided a Starter Grant by WIRF and has recently published a paper testing the effectiveness of simultaneous versus sequential breast expression. She found that simultaneous expression stimulated more milk ejections and removed a greater volume and percentage of available milk with a higher fat content than sequential breast expression. Thus, for mothers who express occasionally or who are pump-dependent for their preterm infants, simultaneous breast expression is more efficient and efficacious yielding more milk with a higher energy content than sequential breast expression.

Chief Investigator:

Prof Peter Hartmann
BRurSc(Hons) PhD

Associate Investigators:

Dr Donna Geddes PhD

Dr Jacqueline Kent PhD

Dr Ching Tat Lai PhD

Dr James Lui PhD

Dr Lynda Chadwick
MBBS FRAP (Paed)

Dr Marnie Rowan MBBS

Ms Melinda Boss BSc Pharm

Ms Catherine Garbin IBCLC

Ms Tracey Williams BSc

Research Students:

Dr Foteini Hassiotou BSc PhD

Mr Mohommed Alsaweed
BSc, MSc

Ms Holly McClellan BSc (Hon)

Ms Sadaf Khan BSc

Ms Vanessa Sakalidis BSc (Hon)

Ms Claire Moliniari BSc (Hon) PhD

Ms Elizabeth Thomas BSc

Ms Kristin Piper BSc

Ms Sharon Perrella MSc

Mr Lukas Christen
HF (Med Eng;Switzerland)

Ms Zoya Gridneva BSc

Alecia-Jane Twigger BSc

Michelle NG Jia Hui BSc

Duaa Al Qatabi MID

Amanda Lei Fu MID

Jothsna Jayaraman MID

Ms Ruth Abbott

Major Sponsors:

Women and Infants Research Foundation

Medela AG

BREASTMILK STEM CELLS

HUMAN MILK ('BREASTMILK') ALLOWS OPTIMAL GROWTH AND DEVELOPMENT OF THE HUMAN INFANT, BEING A NATURAL SOURCE OF NUTRITION, PROGRAMMING AND PROTECTION FOR THE INFANT. AMONGST ITS BIOACTIVE BIOCHEMICAL FACTORS, BREASTMILK CONTAINS LIVE MATERNAL CELLS, THE PROPERTIES OF WHICH AND ROLE FOR THE BREASTFED BABY ARE NOT WELL UNDERSTOOD. THIS STUDY SETS OUT TO ILLUMINATE THE CELLULAR CONTENT OF BREASTMILK, WITH SPECIAL FOCUS ON THE NEWLY DISCOVERED STEM CELLS AND THEIR POTENTIAL ROLE IN EARLY INFANT DEVELOPMENT.

Chief Investigators:

Prof Peter E. Hartmann AM, BRurSc (Hons) PhD

Dr Foteini Hassiotou

Associate Investigators:

Prof Luis Filgueira MD

Prof Naomi Trengove BSc PhD

Dr Ching Tat Lai BSc GradDipSc MSc PhD

Major Sponsor:

Women and Infants Research Foundation

Medela AG

Acknowledgements:

We would like to acknowledge our sponsors and the Australian Breastfeeding Association for assistance in recruitment of participants as well as all participating mothers for their breastmilk donations.

RESEARCH HIGHLIGHTS

We have identified in breastmilk of women of various lactation stages stem cells which have the ability to differentiate in culture towards many different cell types of the body, including breast, bone, fat, liver, pancreatic and nerve cells. This discovery opens new avenues for exploration of the ability of these cells to differentiate *in vivo* (within the body), which will provide the first evidence that breastmilk stem cells may indeed contribute to tissue homeostasis, repair, and/or regeneration in the breastfed baby. Moreover, the non-invasive, plentiful and ethical nature of breastmilk now opens new avenues for the potential use of breastmilk stem cells in regenerative medicine for the treatment of various diseases, such as diabetes, and neurodegenerative diseases. Finally, since breast stem cells are often responsible for the initiation, progression and metastasis of breast cancer, these newly identified breastmilk stem cells may provide useful models in the study of breast cancer and its treatment.

Chief Investigator, Dr Foteini Hassiotou.

THE VOICE STUDY

» WE ARE EXCITED THAT THE SECOND PHASE OF THIS STUDY HAS BEEN FUNDED AND WE ARE LOOKING FORWARD TO SEE WHETHER THE VOICE PROBLEM WE IDENTIFIED IN THE TINIEST PREMS WILL ALSO BE SEEN IN OTHER PREMS AS WELL.

The first phase of the study, confined to just those extremely preterm infants born before 25 weeks gestation found that about 60% of these children tested at around 10 years of age had significant voice problems, even if parents had not always been aware of them as a problem. We have shown that voice abnormality relates directly to how many times these children had to be` intubated, that is, to pass a tube into the windpipe to help their immature lungs keep working. These voice abnormalities included hoarseness of the voice, or a soft breathy voice with children having difficulty making themselves heard, or having an inability to shout loudly. We know from other research that such voice problems can have an adverse emotional effect on children and that is exactly what we found also, with questionnaire responses indicating a much higher rate of these and other problems than we expect to see in other children.

In the second phase of the study, therefore, we are seeing a wider range of preterm children, to see if this problem extends to more mature preterm children, and this time we will be offering specific voice therapy to those with definite voice abnormality. Part of the study design includes the ability to assess how well this voice therapy works in these children, as this has not been shown before - as with many aspects of this study it is all new ground and is attracting a lot of interest. For those with the most severe voice problems, we will be offering an expert assessment of the larynx by videostroboscopy – a direct examination of the larynx by ENT surgeon Associate Professor Shyan Vijayasekaran, who is part of this research team, as some of the conditions leading to voice abnormalities may be improved by surgery.

Already two publications relating to the study have been completed. The first, in press, relates to the new acoustic voice assessment (AVQI) we are using – a computer analysis of a recorded voice signal, which has never been used in a systematic study in children before, and this technology is looking really promising.

The second publication provisionally accepted in Pediatrics concerns the relationship between voice and the intubation and early neonatal history of these children.

In addition various aspects of the first phase of the study have been presented in national and international meetings in Sydney, Boston, Hobart and Melbourne.

L-R: Ali Buckland, Victoria Reynolds, Rona Kelly, Noel French, Jean Bailey, Jodi Lipscombe

Investigators:

Dr Noel French FRACP

Dr Rona Kelly FRACP

Jodi Lipscombe BSc

Victoria Reynolds BSc

Jean Bailey BSc

C/A Prof Shyan Vijayasekaran FRACS

Associate Investigators:

Ali Buckland BSc

Dr Suzanne Meldrum PhD

Raine Study Celebrations

— 21 years of research excellence

» IT IS WITH GREAT PRIDE THAT THE RAINE STUDY CELEBRATED TWENTY-ONE YEARS' RESEARCH EXCELLENCE IN 2011. THE STUDY COMMENCED IN 1989 WITH THE RECRUITMENT OF 2,900 MOTHERS AT KING EDWARD MEMORIAL HOSPITAL, AND HAS FOLLOWED THE OFFSPRING CLOSELY OVER THE LAST TWENTY-ONE YEARS. DURING THIS PERIOD, THE RAINE STUDY HAS MADE NUMEROUS IMPORTANT PUBLIC HEALTH FINDINGS, AND HAS BECOME INTERNATIONALLY RECOGNISED AS A VALUABLE COLLABORATOR IN NUMEROUS MULTINATIONAL RESEARCH INITIATIVES INTO HEALTHY CHILDHOOD DEVELOPMENT, CHILDHOOD DISEASE AND THE EARLY ORIGINS OF ADULT DISEASE.

At present, the Raine Study encompasses more than 145 researchers and 25 research groups working on projects to improve our understanding of factors that influence health and disease in children, adolescents and now young adults.

The Raine study is an invaluable resource for researchers in Western Australia with research being conducted by investigators from The University of Western Australia, Curtin University of Technology, Edith Cowan University and the University of Notre Dame. As the cohort ages, the value of this resource will increase exponentially. Fostering the national and international collaboration of Raine study principal investigators will further increase the value of the cohort, increase productivity of the Raine study investigators and enhance funding opportunities available for the Raine study and Western Australian researchers.

To celebrate this great success, and the tireless, munificent support of the Raine Study participants and their families, an event was held in the Gardens of Government House. This event was attended by the Study patrons, His Excellency The Governor and Mrs McCusker, prominent members of The University of Western Australia and the Telethon Institute for Child Health Research, members of the Raine Study research teams and most importantly, the participants and their families.

Prof Fiona Stanley

L-R: Prof John Newnham;
His Excellency, Governor Malcolm McCusker;
Mrs Tonya McCusker; Dr Anne Smith;
Prof Peter O'Sullivan; Prof Leon Straker

During the day, participants were able to speak to researchers from the twenty-five groups and discuss the finding of the last twenty-one years. Interactive displays were set up where participants and their parents were able to check their lung function, have a quick eye test, see how fit they were, and guess how much fibre was in different types of legume.

Awards were presented by His Excellency The Governor to outstanding researchers within the Study. Prizes were generously donated by the Raine Medical Research Foundation of The University of Western Australia. Winthrop Professor John P Newnham received the award for the "Most Distinguished Scientific Finding Utilising the Raine Study". Professors Leon Straker and Peter O'Sullivan, and Dr Anne Smith jointly received the award for the "Most Distinguished Public Health Finding Utilising the Raine Study".

Raine Study participants who have made outstanding contributions over the last twenty-one years were also recognised with awards presented by His Excellency.

THE RAINE STUDY

THE RAINE STUDY

The Raine Study

THE WESTERN AUSTRALIAN PREGNANCY (RAINE) COHORT STUDY IS ONE OF THE LARGEST AND MOST SUCCESSFUL LONGITUDINAL PREGNANCY COHORTS IN THE WORLD. THE STUDY COMMENCED IN 1989 WITH THE RECRUITMENT OF 2900 WOMEN WHO WERE LESS THAN 18 WEEKS PREGNANT. INITIALLY, THE FOCUS OF THIS STUDY WAS TO EXAMINE THE EFFECTS OF REPEATED DOPPLER ULTRASOUND; HOWEVER, THE LONG TERM VALUE OF THIS UNIQUE COHORT WAS RECOGNISED, AND THE STUDY CONTINUED INTO CHILDHOOD, ADOLESCENCE AND NOW ADULTHOOD.

Over the past 22 years, the 2968 children born into the Raine Study, and their parents, have generously participated in 10 cohort reviews at ages 1, 3, 5, 8, 10, 14, 17, 18, 20 and now 23. The Raine Study now encompasses 25 dedicated research groups, 150 researchers and participates in numerous multinational research consortia.

The (Sleep) Study will generate an internationally unique dataset

of full laboratory-based sleep studies in a group of young adults who have been prospectively, comprehensively characterised from 18 weeks gestation.

Over 1700 members of the Cohort remain active, and participate in regular reviews. The 20 year Cohort Review has recently been completed at the Lions Eye Institute, and focused on eye health, development and disease. The Raine Eye Health Study is one of the first studies of eye health and disease in young adults, for which very little data exists as it is presumed that young adults have the best vision. The study has a particular focus on visual acuity, turned eye or lazy eye, and sun damage related disorders such as pterygium and keratoconus. Particular attention has also been focused on the cornea and retina. Although not yet affected by diseases of old age, the 20 year Raine Eye Health Study provides a baseline for future examinations at hopefully 40 years and 60 years.

During the Raine Eye Study, detailed measurements on all aspects of eye health and vision were collected, as well as information on lifestyle, sun exposure and outdoor activities. Data from the study combined with genetic information will allow the ophthalmology research group to participate in multinational research consortia investigating eye development, the basis of colour vision, and numerous eye disorders. This is particularly useful with Genome Wide Association Studies (GWAS) and we already have a replication cohort for most ocular biometric measures including the Twins Eye Study in Tasmania and the Brisbane Adolescent Twins Study.

The 23 year Cohort Review commenced in early 2012, and focuses on sleep and asthma. This review is being conducted at the newly developed Centre for Sleep Science on the Crawley Campus of The University of Western Australia. The Sleep research group is utilising the unique longitudinal data collected on participants in the Study to determine, for the first time, the prevalence, phenotype and risk factors for Obstructive Sleep Apnoea in early adulthood. To do this Raine participants will undergo comprehensive overnight laboratory-based sleep studies.

This study will generate an internationally unique dataset of full laboratory-based sleep studies in a group of young adults who have been prospectively, comprehensively characterised from 18 weeks gestation. It will be the first Australian "longitudinal sleep cohort". This data will provide the opportunity to define the natural history of obstructive sleep apnoea, and to study causal relationships between this disorder and metabolic, cardiovascular and neurocognitive outcomes.

The dedication and ingenuity of the Raine Study researchers continues to produce numerous high quality publications each year. In the first seven months of 2012, the Study produced 31 manuscripts which have been published in national and international peer-review journals. Of these, four have been in the exclusive journal Nature Genetics. The Raine Study will continue to build upon the success of 2012, and looks forward to new and exciting research in 2013.

Scientific Director:

Associate Prof Craig Pennell
MBBS (Hons) PhD (Dist)
FRANZCOG CMFM

Study Manager:

Jenny Mountain BA MBA MClinEpi

Raine Reserch Group Leaders:

Anaesthetic
Prof Britta Regli
Von Ungern Sternberg

Asthma and Allergy
Prof Patrick Holt

Cardiovascular and Metabolic
Prof Lawrie Beilin

Cognitive Neuroscience
Clinical Prof Jonathan Foster

Dental Health
Prof Linda Slack-Smith

Developmental Origins of Health and Disease (DOHaD)
Prof John Newnham

Eating Disorders
Associate Prof Sue Byrne

Endocrinology
Dr Vijay Panicker

Epigenetics
Dr Rae-Chi Huang

Gastroenterology and Hepatology
Associate Prof Leon Adams

Genetic Epidemiology
Associate Prof Craig Pennell

Raine Reserch Group Leaders contd:

Growth
Dr Wendy Chan

Hypothalamic Pituitary Adrenal Axis
Dr Helen Atkinson

Infectious Disease
Prof Jenefer Blackwell

Language Development
Associate Prof Andrew Whitehouse

Mental Health
Associate Prof Andrew Whitehouse

Musculo-Skeletal
Prof Leon Straker

Otolaryngology
Prof Rob Eikelboom

Ophthalmology
Prof David Mackey

Physical Activity
Associate Prof Beth Hands

Pregnancy and Birth
Prof John Newnham

Reproductive Health
Prof Martha Hickey

Risk Taking Behaviour
Associate Prof Rachel Skinner

Sleep
Prof Peter Eastwood

Sponsors:

National Health and Medical Research Foundation

Canadian Institutes of Health Research

National Heart Foundation

Rotary

Raine Medical Research Foundation

The University of Western Australia

Curtin University

Women and Infants Research Foundation

Telethon Institute of Child Health Research

Lions Eye Institute

RAINE GENETIC EPIDEMIOLOGY RESEARCH GROUP

The Raine Study

GENETIC EPIDEMIOLOGY IS THE STUDY OF THE GENETIC AND ENVIRONMENTAL COMPONENTS OF COMPLEX HUMAN DISEASE. THE RAINE GENETIC EPIDEMIOLOGY GROUP IS PRIMARILY INVESTIGATING THE RELATIONSHIP BETWEEN GENES, THE ANTENATAL AND POSTNATAL ENVIRONMENTS, AND HOW THEY CONTRIBUTE TO THE DEVELOPMENT OF ADULT DISEASES INCLUDING METABOLIC SYNDROME (CORONARY HEART DISEASE, STROKE, INSULIN RESISTANCE, TYPE 2 DIABETES AND HIGH CHOLESTEROL), OBESITY, NEUROLOGIC DISORDERS AND MENTAL ILLNESS.

Chief Investigators:

Associate Prof Craig Pennell PhD (Dist) FRANZCOG CMFM
Scientific Director of the Western Australian Pregnancy (Raine) Cohort
Associate Prof in Maternal Fetal Medicine
The University of Western Australia

Research Group Members:

Prof Lawrie Beilin AO MBBS MD FRCP FRACP

Prof Eric Moses BSc MSc PhD

Prof John Newnham MBBS MD FRCOG FRANZCOG DDU CMFM

Assistant Prof Julie Marsh BSc MSc PhD

Mr Wei Ang BCM (Hons) MSc

PhD Candidate Students 2010, 2011:

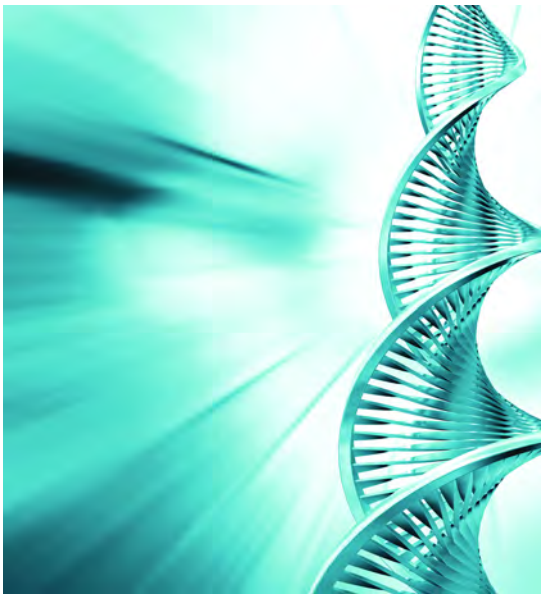
Ms Sandra Louise

Ms Priya Parmar

Ms Nicole Warrington

Dr Scott White

Mr Richard Maganga



Although adverse antenatal and postnatal environments increase the risk of particular adult diseases, not all individuals exposed to these environments develop these conditions, suggesting that an individual's genotype may contribute to the eventual outcome. The Genetic Epidemiology research group aims to define genes and interactions between genes and environment that underlie developmental origins of health and disease (DOHaD). The results from this group's work will have significant impact upon our understanding of the biology underlying DOHaD. Early identification of genetic signatures that enhance the risk of adult disease may provide opportunities to develop lifestyle or medical intervention strategies aimed at preventing these adverse outcomes.

RESEARCH HIGHLIGHTS 2010-2011

- The Genetic Epidemiology research group has recently published a number of articles in prominent scientific journals including Nature Genetics and Lancet [1, 2, 3, 4]. These articles have identified new genetic regions that are associated with birth-weight, age at puberty, asthma, lung function and fetal growth trajectories.
- New genetic regions have also been identified that are associated with: Adolescent liver function, non-alcoholic fatty liver disease, adolescent blood sugar, childhood obesity, infant head circumference, intracranial volume, atopic dermatitis, megalocornea, corneal epithelial thickness, language development, chronic musculoskeletal pain, arm circumference, severe otitis media,
- Acquisition of Genome Wide Association Study (GWAS) data during 2010 has enabled the Raine Study to participate in 9 international genetics consortia including EGG, EAGLE, ReproGen, CORNET, Twins Eye Study, International Eye Genetics Consortium, PREBIC, CHARGE and the Australian Asthma Genetics Consortium. Involvement in these consortia and the genetic data generated will continue to produce high profile publications for the next 5-8 years.

- Life course analyses have been completed for the most well-known obesity gene (the fat mass and obesity gene FTO). With international collaborators, we have shown that during fetal life this gene is associated with growth restriction. After excessive catch up growth in early childhood, this gene is then is associated with obesity, an association that continues lifelong.
- During 2011, the Genetic Epidemiology research group completed the collection and extraction of DNA from Raine participants, mothers and fathers. These DNA triads (and the dense longitudinal data available in the Raine Study) are unique and will be a highly utilised resource for the Raine Study for the next decade.

National Collaborators:

Queensland Institute of Medical Research
Prof Peter Visscher

International Collaborators:

Cambridge University, UK
Prof Susan Jebb
Prof Gina Ambrossini
University of Southampton, UK
Dr Tom Gaunt
Imperial College London, UK
Prof Marjo-Riitta Jarveilin
King's College London, Institute of Psychiatry, UK
Prof Robert Plomin
Oxford University, UK
Prof Mark McCarthy
University of Bristol, UK
Prof George Davey-Smith
Prof Debbie Lawlor
Prof Kate Tilling
Prof Pauline Emmett
Dr Laura Howe
University of Edinburgh, UK
Prof Brian Walker
Prof Ian Deary
Prof Alan Wright
Prof Harry Campbell
Dr Igor Rudan
Dr Jim Watson
Dr Caroline Hayward
Dr Jennifer Bolton
University of Exeter, UK
Prof Tim Frayling
Dr Rachel Freathy
University of Leicester, UK
Dr Martin Tobin
Dr Louise Wain
Erasmus Medical Centre, The Netherlands
Prof Vincent Jaddoe
Prof Cornelia van Duijn
Prof Henning Tiemeier

International Collaborators contd:

University of Copenhagen, Denmark
Prof Hans Bisgaard
Prof Anne Marie Nybo Anderson
Columbia University, USA
A/Prof Renee Goodwin
The University of Arizona, USA
Prof Martinez
University of Pennsylvania, USA
Associate Prof Struan Grant
McMaster University, Canada
Dr Ryan J. Van Lieshout
Dr Krysta Boylan
University of Toronto, Canada
Prof Stephen Lye
Prof Stephen Matthews
Prof Laurent Briollais
Prof John Challis
Associate Prof Laurent Briollais
Early Genetics Lifecourse Epidemiology (EAGLE) Consortium
Early Growth Genetics (EGG) Consortium
Avon Longitudinal Study of Parents and Children (ALSPAC) Consortium
Generation R Study, The Netherlands
North Finnish Birth Cohort (NFBC)
Copenhagen Studies in Asthma in Childhood (COPSAC)
Cohorts for Heart and Aging Research in Genomic Epidemiology (CHARGE) Consortium
Age, Gene, Environment Susceptibility (AGES) Study
Atherosclerosis Risk in Communities (ARIC) Study
Cardiovascular Health Study (CHS)
Framingham Heart Study (FHS)

Sponsors:

National Health and Medical Research Council
Canadian Institute of Health Research

THE FETAL AND EARLY CHILDHOOD ORIGINS OF THE POLYCYSTIC OVARY SYNDROME (PCOS)

The Raine Study

PCOS IS THE MOST COMMON ENDOCRINE DISORDER IN WOMEN. THE ORIGINS OF PCOS ARE UNKNOWN, BUT ANIMAL AND SMALL HUMAN STUDIES SUGGEST THAT PCOS MAY ARISE DUE TO ELEVATED PRENATAL ANDROGEN EXPOSURE. THIS HYPOTHESIS HAS NOT PREVIOUSLY BEEN TESTED IN LARGE PROSPECTIVE STUDIES OF NORMAL PREGNANCY.

This study aimed to test this hypothesis in the Raine Cohort using archived maternal and umbilical cord biological samples. Participation was demanding for these adolescents, requiring attendance on day 2-5 of menstrual cycle for ultrasound, blood tests and examination. Nevertheless, we recruited over 250 girls and successfully addressed all our study aims.

RESEARCH HIGHLIGHTS

The most recent publications arising from our research describe the features that are commonly present in PCOS, which are very prevalent among Western Australian girls. Furthermore we reported that the higher androgen levels commonly found amongst girls with PCOS in adolescence were associated with risk factors for the metabolic syndrome- a condition which predisposes an individual to diabetes and heart disease.

Chief Investigators:

Prof Martha Hickey BA (Hons) MSc MBChBMRCOG MD FRANZCOG

Prof Roger Hart MRCOG FRANZCOG CREI

Prof (Adj) Dorota Doherty BSc (Hons) PhD

Dr Deborah Sloboda BSc (Hons) MSc PhD

Collaborators:

Prof Steve Franks FRCP PhD RS Imperial College, London

Prof Robert Norman University of Adelaide, South Australia

Research Staff:

Lee Ann Mahoney RN RM Project Manager

Sarah Simpson RN

Helen Box RN RM

Cherry Young RN RM

Major Sponsors:

National Health and Medical Research Council

The University of Western Australia

Department of Health of Western Australia

Sponsors:

We are grateful to the Raine Medical Research Foundation at The University of Western Australia and the Telethon Institute of Child Health Research for financial support and general support over the years. The collection of maternal data and samples was funded by the Women and Infants Research Foundation (WIRF) while the collection of adolescent data and samples was funded by NHMRC project grant number 403968 and by a University of Western Australia Ada Bartholomew grant.

Acknowledgements:

We are extremely grateful to all the families who took part in this study. We are grateful to Lee Ann Mahoney, Sarah Simpson and Helen Box for study recruitment and James Humphreys for database construction and maintenance and the KEMH Ultrasound Department for their assistance and understanding.


Martha Hickey


Roger Hart


Dorota Doherty


Helen Atkinson


Lee Ann Mahoney


Sarah Simpson


Helen Box


Cherry Young

» THIS IS THE FIRST STUDY TO UTILISE A LARGE AND WELL-ESTABLISHED COHORT (THE WESTERN AUSTRALIAN PREGNANCY COHORT - RAINE STUDY) TO FOLLOW FROM INTRAUTERINE LIFE THROUGH ADOLESCENCE TO INVESTIGATE KEY FETAL AND CHILDHOOD EVENTS LEADING TO DECREASED TESTICULAR VOLUME (AN EXCELLENT REPRODUCIBLE AND RELIABLE SURROGATE FOR SERTOLI CELL NUMBER, FUNCTION AND SPERM OUTPUT), AND ABNORMAL SEMEN PARAMETERS AND ABNORMALITIES IN HORMONE PRODUCTION.

Using existing data we will determine the relationship between impaired testicular function in adulthood and the potential determinants from intrauterine environment using the existing data from the Raine study: fetal growth patterns and birth weight, and intrauterine exposure to maternal cigarette smoking and from the extrauterine environment: childhood growth patterns and adiposity, adolescent and adult fat distribution and exposure to cigarette smoking – active and passive. Furthermore this study will analyse the effect upon testicular function of intrauterine exposure to oestrogens by measuring maternal and cord blood oestrogens from serum stored and from exposure to endocrine disrupting chemicals whilst *in-utero*.

RESEARCH HIGHLIGHTS

- Recruitment to this study began in April 2010. By July 2011 we had recruited 257 who have now completed the follow up and 157 who are still completing the Raine cohort follow-up. Of the 257 who have completed the follow-up, 218 have completed both the testicular ultrasound and semen production assessment, 32 have completed the ultrasound only and seven boys only produced a semen sample and declined ultrasound examination. Recruitment will continue for a further 6 months.

Chief Investigators:

Prof Roger Hart
MRCOG FRANZCOG CREI

Prof Niels Skakkebaek

Dr Stephen Junk

Prof (Adj) Dorota Doherty
BSc (Hons) PhD

Dr Deborah Sloboda BSc (Hons)
MSc PhD

Collaborators:

WIRF/School of Women's and Infants' Health/The University of Western Australia

Prof John Newnham MD FRANZCOG

Prof Jan Dickinson MD FRANZCOG

Prof Robert McLachlan,
Prince Henry's Research Institute

Prof Robert Norman, University of Adelaide, South Australia

Prof David Handelsman ANZAC Research Institute

Prof Martha Hickey BA (Hons) MSc MBChBMRCOG MD FRANZCOG
University of Melbourne

Prof Katharina Main, University of Copenhagen

Sponsors:

We are grateful to the Raine Medical Research Foundation at The University of Western Australia and the Telethon Institute of Child Health Research for financial support and general support over the years. The collection of maternal data and samples was funded by the Women and Infants Research Foundation (WIRF) while the collection of adolescent data and samples was funded by NHMRC project grant number 634457 and Merck-Serono funded the testicular ultrasound measurements.

Acknowledgements:

We are extremely grateful to all the families who took part in this study. We are particularly grateful to Jenny Mountain, Alex Baptista from the Raine team and Michelle Pedretti and the KEMH Ultrasound Department for their assistance and understanding and for all the staff at Fertility Specialists of Western Australia for performing the semen analyses.

GYNAECOLOGIC ONCOLOGY

» THE 2011-2012 YEAR HAS BEEN A VERY SIGNIFICANT YEAR FOR THE COLLABORATIVE WORK BETWEEN THE WESTERN AUSTRALIAN GYNAECOLOGIC CANCER SERVICE (WAGCS) AND WIRF. TO HIGHLIGHT SOME OF THE EVENTS DURING THE YEAR:

- In July 2011, Gynaecologic Oncologist, Yee Leung became the inaugural Professor of Gynaecologic Oncology, School of Women's and Infants' Health, University of Western Australia
- In January 2012, Gynaecologic Pathologist, Colin Stewart became an adjunct Clinical Professor in the School of Women's and Infants' Health, University of Western Australia
- The establishment of The McCartney Gynaecological Cancer Research and Education Fund following Professor McCartney's death on October 22, 2011. $56,680 has been raised for this cause.
- The establishment of the Western Australian Gynaecologic Cancer Research Centre with a "Last Supper" fundraising dinner held on May 27, 2012 at the Grand Palace Chinese restaurant. Through the generosity of the owners of the Grand Palace, Fai and Wenny Wang, $134,000 was raised on the very last night the restaurant traded before closure due to the Perth foreshore works. We are still seeking a further $350,000 for the Centre. An early project will be the establishment of the Western Australian Gynaecologic Oncology Bio-specimen Bank.
- Ongoing participation in the Australian Ovarian Cancer Study (AOCS), the Ovarian Cancer Pattern of Care Survey, the Ovarian Cancer Prognosis and Lifestyle Study (OPAL), The Australian National Endometrial Cancer Study (ANECS), and The ANECS Clinical Follow-up & Quality of Life extension study. A report on these studies follows. Special thanks to our diligent research nurses, Cherry Young and Melanie Mosey for their hard work with these studies. Some interesting statistics from AOCS nationally include recruitment of 2,687 patients, completion of 18,132 forms, following 38,357 cycles of chemotherapy and 44,120 individual CA125 readings resulting in over 60 local, national and international projects leading to more than 70 publications.
- Publications from members of the WAGCS, listed later.

AUSTRALIAN OVARIAN CANCER STUDY (AOCS)

THE AUSTRALIAN OVARIAN CANCER STUDY WAS INITIATED IN 2001 TO CREATE A NATIONAL RESOURCE FOR OVARIAN CANCER RESEARCH. PROJECTS WERE DESIGNED TO IDENTIFY COMBINATIONS OF GENETIC, LIFESTYLE AND ENVIRONMENTAL FACTORS THAT CHANGE OVARIAN CANCER RISK. BY JULY 2002 RECRUITMENT WAS UNDERWAY.

For recruitment we needed 1000 women diagnosed with primary ovarian cancer, and 1000 matched control women. All study participants were asked to complete questionnaires on diet and lifestyle, and to donate specimens comprising of blood and urine. Fresh tumour tissue was donated from the women undergoing ovarian cancer surgery. Clinical follow-up was also undertaken.

The number of participants exceeded initial expectations and collectively 2,500 women were recruited to the study. Western Australia recruited 284 women. We achieved a 5 year median follow-up overall and for some women up to 9 years follow-up.

AOCS also investigated relapsed disease. Most women with ovarian cancer initially respond well to treatment but sometimes the cancer returns. They suffer the build up of fluid in their abdomen called ascites. As ascites is a valuable source of tumour cells, we collected ascites from patients in the study who had relapsed. The aim of the project is to perform genomic analysis of tumour DNA from primary epithelial ovarian cancers and patient matched relapsed cases. Clinical follow up was also instituted

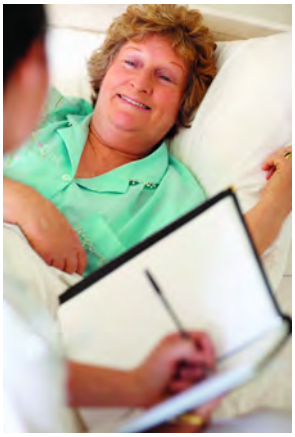
By the end of 2011, collectively in Australia we recruited 2,687 patients to AOCS, obtained 1,097 fresh tissue and blood samples, assisted patients in submitting 1,672 epidemiological/dietary questionnaires and we achieved a 5 year median follow-up overall and for some women up to 9 years clinical follow-up.

Since 2006, AOCS has opened its Bio-Bank to researchers both nationally and internationally, allowing all researchers to apply to AOCS to access its bio-specimens and associated data.

Projects and data analyses are continuing.

AOCS has supported over 60 local, national and international projects leading to more than 70 publications. The study is and will continue to be a uniquely powerful resource for ovarian research.

Study website: **www.aocstudy.org**



Principal Investigators:

Prof David Bowtell,
Peter MacCallum Cancer Centre

Prof Adele Green
Queensland Institute of Medical Research

Dr Anna DeFazio
Westmead Hospital

Western Australian Clinical Collaborators:

Prof Tony McCartney (dec)
Western Australian Gynaecologic Cancer Service

Prof Yee Leung

Clinical Prof Ian Hammond
Western Australian Gynaecologic Cancer Service
School for Women's and Infants' Health

Research Nurses:

Cherry Young RN RM

Colleen Ball RN RM BN

Women and Infants Research Foundation


Yee Leung


Colleen Ball


Cherry Young


Ian Hammond

OVARIAN CANCER - PATTERNS OF CARE SURVEY

Gynaecologic Oncology

» THE AIM OF THIS STUDY WAS TO COLLECT BASIC SOCIO-DEMOGRAPHIC AND TREATMENT (PRIMARY AND ADJUVANT) INFORMATION FOR ALL WOMEN DIAGNOSED WITH OVARIAN CANCER (INCLUDING FALLOPIAN TUBE AND PRIMARY PERITONEAL CANCERS) IN AUSTRALIA DURING A ONE YEAR PERIOD (2005) TO DESCRIBE THE PATTERNS OF PATIENT MANAGEMENT AND TO RELATE THIS TO PATIENT SURVIVAL.

This study only required medical record review of the 174 women identified in Western Australia. Descriptive statistics to summarise data regarding treatment of women and survival analysis according to clinicopathological and treatment groups.

Primary data collection is complete in Qld, NSW, Victoria, SA, WA and Tasmania. The data have been entered into a customised database and primary analyses to address surgical and adjuvant treatment of women with ovarian cancer in Australia are complete. Secondary analyses to address questions regarding complication rates, treatment of recurrent disease will commence later this year.

Prior to evaluating the relation between clinical characteristics of ovarian cancer and patient survival and evaluating the relation between aspects of patient management and survival we plan to go back to the State Cancer registries to obtain updated survival information for the women in the study. Although not essential, this will provide longer follow-up and thus will strengthen these analyses. This work will be conducted in late 2012 and the first half of 2013.

Chief Investigator:

Associate Prof Penny Webb

Site Investigators:

Prof Yee Leung

Dr Stuart Salfinger
Western Australian Gynaecologic Cancer Service
School of Women's and Infants' Health

Dr Jason Tan

Research Nurse:

Melanie Mosey RN RM
Women and Infants Research Foundation

OVARIAN CANCER PROGNOSIS AND LIFESTYLE STUDY (OPAL)

» THERE IS EVIDENCE THAT LIFESTYLE FACTORS INFLUENCE RECURRENCE AND SURVIVAL IN BREAST AND COLON CANCER BUT THERE IS CURRENTLY NO DIRECT EVIDENCE AS TO WHETHER THE SAME IS TRUE FOR OVARIAN CANCER. THIS STUDY AIMS TO IDENTIFY WHETHER POTENTIALLY MODIFIABLE LIFESTYLE CHOICES INCLUDING PHYSICAL ACTIVITY, DIET AND MEDICATION USE ARE ASSOCIATED WITH RECURRENCE AND SURVIVAL.

SPECIFICALLY, THE AIMS OF THIS STUDY ARE TO:

- Identify whether lifestyle after completion of primary treatment is associated with: Progression-free and overall survival, quality of life, insomnia
- Identify whether lifestyle during chemotherapy is associated with: Prevalence and severity of side-effects, physical, functional and emotional wellbeing, chemotherapy completion rates
- Investigate the relationship between genotype and survival
- To use this information to develop evidence-based resources for women with ovarian cancer

Chief Investigators:

Associate Prof Penny Webb

Anna de Fazio

Chris Nagle

Michael Friedlander

Peter Grant

Prof Andreas Obermair
Queensland Centre for
Gynaecological Cancer

Associate Investigators:

Vanessa Beesley

Jonathon Blair

Georgia Chenevix-Trench

Penny Blomfield

Alison Brand

Alison Davis

Prof Yee Leung

Jim Nicklin

Michael Quinn

Kath Nattress

Annabel Davies

Jane Francis

Karen Livingstone

Helen O'Neill

Merran Williams

Research Nurse:

Melanie Mosey RN RM
Women and Infants Research
Foundation

AUSTRALIAN NATIONAL ENDOMETRIAL CANCER STUDY (ANECS)

» MOLECULAR EPIDEMIOLOGY OF ENDOMETRIAL CANCER (COMMENCED AUGUST, 2005): INFORMATION FROM 1500 WOMEN WITH ENDOMETRIAL CANCER AND 750 CONTROLS TO RECRUITMENT OF CASES, CONTROLS AND FAMILY MEMBERS IS COMPLETE WITH FINAL NUMBERS OF 1495 CASES, 746 CONTROLS, 236 RELATIVES. INFORMATION HAS BEEN COLLECTED TO DETERMINE WHICH FACTORS ARE MORE COMMON IN WOMEN WITH ENDOMETRIAL CANCER AND THE CONTRIBUTION OF LIFESTYLE EXPOSURES AND FAMILY AND MEDICAL HISTORY. QUALITY OF LIFE DATA COLLECTION IS COMPLETE AND MOLECULAR AND EPIDEMIOLOGICAL ANALYSES ARE ONGOING.

AIMS OF THE ORIGINAL ANECS STUDY:

- To clarify and identify modifiable risk factors, considering histological types separately
- To examine the genetic basis to disease within multiple-case families*
- To conduct association studies investigating the role of candidate genetic variants in the aetiology of endometrial cancer*
- To establish and maintain a biorepository and comprehensive database (epidemiological, molecular and clinical) for ongoing epidemiological and molecular studies in endometrial cancer

Chief Investigator:

Dr Amanda Spurdle

Associate Prof Penny Webb

Dr Joanne Young

Project Manager:

Suzanne O'Brien

Site Investigators:

Western Australian Gynaecologic Cancer Service, School of Women's and Infants' Health

Prof Yee Leung

Clinical Prof Ian Hammond

Dr Stuart Salfinger

Prof Tony McCartney (dec) University of Notre Dame

Research Nurse:

Melanie Mosey RN RM Women and Infants Research Foundation

* The work of the original ANECS study *(see left)* has been extended further using a *genome-wide association study approach*, funded by NHMRC in 2009 and 2012

The ANECS Clinical Follow-up & Quality of Life Extension study includes detailed information about how women were managed to assess how this varies across Australia and how differences in care affect patient outcomes. Factors including assessment of the variability in primary and adjuvant treatment in Australia, role of routine follow-up to detect early recurrence, tumour subtype, stage and grade, and quality of life needs of endometrial cancer survivors.

PROGRESS SINCE PREVIOUS REPORT

Germline and tumour biospecimen processing

The ANECS biorepository currently holds 297 fresh endometrial tumours (frozen or RNAlater), 268 research FFPE blocks, collections of slides from clinical FFPE blocks collected at surgery for 645 cases, and collections of slides from curettage FFPE blocks for 41 cases. We have completed Tissue MicroArray (TMA) construction for immunohistochemical assays, with 8 TMAs constructed for ongoing and future research projects. In total we have fixed tissue in some form from 899 cases.

Mutation Testing

Mismatch repair protein immunohistochemistry (IHC) is now complete for 729 unselected cases, of which 171 (23%) show abnormal IHC expression that is being followed up by mutation testing for the 159 cases with DNA available, including MLPA analysis for large deletions and exonic gene sequencing.

Association Studies

We have now published all relevant findings for the initial candidate SNP studies undertaken (see publications below). We have continued our genome-wide association study and in addition to the published validation study of 50 top SNPs published in the prestigious Journal Nature Genetics last year, we have recently completed genotyping of additional 1544 SNPs in approximately 4500 endometrial cancer cases and will compare frequencies of these SNPs to a large control dataset available through collaboration with the Breast Cancer Association Consortium. In addition, we have initiated a study to investigate shared genetic aetiology of endometrial cancer and endometriosis, using a prediction analysis approach pioneered by researchers at QIMR.

Epidemiological Risk Factor Association Analyses

Interview and dietary data have been entered into customised databases. We have completed cleaning of the core epidemiological variables and conversion of dietary data to nutrient intakes is well underway. We have completed analyses for some variables and published these findings, and analysis and manuscript preparation for other variables collected is ongoing.

Clinical Data and Quality of Life

We were awarded funding from Cancer Australia (2009-2011) to extend the original ANECS study to increase collection of clinical data and to re-contact women to survey their quality of life. Clinical data collected from medical records is almost complete.

Over the past two years we have re-contacted case women to invite them to participate in ANECS Quality of Life Study. To date we have approached by mail 1331 women. Of these, 282 could not be contacted or have died and we have received 650 completed questionnaires. QOL Data collection is now complete.

LAPAROSCOPIC APPROACH TO CARCINOMA OF THE ENDOMETRIUM

ENDOMETRIAL CANCER IS THE MOST COMMON GYNAECOLOGICAL CANCER IN DEVELOPED COUNTRIES. AS THIS DISEASE AFFECTS SO MANY WOMEN, ENDOMETRIAL CANCER MANAGEMENT IS UNDER CONSTANT REVIEW AND SCRUTINY. THE MAIN TREATMENT OF EARLY STAGE ENDOMETRIAL CANCER IS SURGERY.

An International Multicentre Randomised Phase 3 Clinical Trial (LACE)

The aim of the LACE trial is to determine if total laparoscopic hysterectomy (TLH) results in equivalent disease-free survival compared to the treatment of total abdominal hysterectomy (TAH) in patients with apparent early stage (stage 1) endometrial cancer.

The primary objective is that for women with stage 1 endometrial cancer, disease free survival at 4.5 years following TLH is equivalent to disease free survival at 4.5 years following TAH.

The secondary objective is that patients who have a TLH will have the same overall survival compared to TAH, and the quality of life of the TLH group will have the benefit of less tissue trauma and blood loss, less pain, and lower complication rates of wound infection, deep vein thrombosis and incisional hernias. Pelvic floor function is also being assessed and compared and the cost effectiveness of TLH compared to TAH is being evaluated.

Patients for this study were recruited through 19 participating gynaecological cancer centres in Australia, which included KEMH, plus New Zealand and Hong Kong. The aim was to recruit 760 patients, commencing in 2006, and the recruitment of 760 patients was completed in July 2010.

This study has the potential to change the preferred surgical management and already this trial has shown that in patients with endometrial cancer, quality of life is significantly better during early and late postoperative phases with TLH than TAH.

Clinical follow-up of patients for 4.5 years in this trial is continuing and will ascertain the equivalence of disease free survival. The main purpose of patient follow-up is to determine patient's health status, disease state and mortality. We are collecting details of relapses of endometrial cancer as well as the development of any other cancers that patients develop.

Study website: **http://www.gyncan.org/projects/current-trials/view/lace-clinical-trial/1**

Principal Investigator:

Prof Andreas
Obermair Queensland Centre for Gynaecological Cancer

Western Australian Chief Investigators:

Prof Yee Leung
King Edward Memorial Hospital School of Women's and Infants' Health

Prof Tony McCartney (dec)
University of Notre Dame

Western Australian Associate Investigators:

Clinincal Prof Ian Hammond

Dr Stuart Salfinger
Western Australian Gynaecologic Cancer Service, School of Women's and Infants' Health

Research Nurses:

Cherry Young RN RM

Colleen Ball RN RM BN

Melanie Mosey RN RM

Women and Infants Research Foundation


Thank You for your support...

OUR HEARTFELT THANKS TO OUR VOLUNTEERS

THE FRIENDS OF THE WOMEN AND INFANTS RESEARCH FOUNDATION VOLUNTEER PROGRAM HAS BEEN RUNNING FOR THIRTEEN YEARS. THE PROGRAM STARTED WHEN WIRF'S CAFÉ/GIFT SHOP OPENED AT KING EDWARD MEMORIAL HOSPITAL IN MARCH 1999. TWENTY VERY SPECIAL LADIES ENROLLED AS VOLUNTEERS TO HELP IN THE CAFÉ/GIFT SHOP. MUCH TO THEIR SURPRISE MANY OF OUR ORIGINAL TWENTY VOLUNTEERS ARE STILL WITH US TODAY (LISTED BELOW). IT IS THANKS TO THEM AND OTHERS JOINING LATER, THAT THE VOLUNTEER CONTRIBUTION TO WIRF HAS NOW EXCEEDED $2 MILLION. THIS FUNDING DIRECTLY BENEFITS WOMEN AND BABIES IN WA THROUGH OUR RESEARCH GRANTS PROGRAM.

After a heartfelt farewell to Mrs Julie Michael in April 2011, we welcomed Mrs Tonya McCusker as our new Patron in July 2011. Mrs McCusker, the Governor Malcolm McCusker and daughter Mary met with our volunteers and staff at a special afternoon tea to celebrate National Volunteer Day in May 2012 (pictured above).

All our volunteers deserve a special mention and our sincere thanks for their hard work and time that they give to us so generously. Our Volunteers are listed below by date of joining Friends of the Women and Infants Research Foundation.

Every one of our volunteers deserves a special mention and thank you. Our volunteers are listed below by date of joining the Friends of the Women and Infants Research Foundation.

1999
Gaile Martyn
Jill Berecry
Maria Crawford
Maria Gapper
Norma Garbin
Raie Bradshaw
Jill Hunt
Annette Lazberger
Kate Campbell
Delphine Moore
Diane Hoffman
Marie Smith
Win Froude
Jan Schofield
Janice Braekevelt
Isobel Sprivulis

2000
Leah McVeigh
Beverley Boyd

2001
Yvonne Neurauter
Nina Leahy
Helen Robertson
Maggie Cooper
Kay Lodge
Helen Roatch
Suzanne Draper
Pam Imms

2002
Sylvia Webster

2003
Elizabeth Hyde
Gillian Ball
Joy Tillett
Rema Starina

2004
Ann Carrington-Jones
Patricia McInnes

2005
Loretta Connery
Pam Sulc
Janet Chang

2006
Beattie Ramel
Elaine Horton

2007
Diana Fletcher
Judith Williams
Robin Simon
June Fox
Zoe Hewitt-Dutton

2008
Julie Nolan
Mary Muscroft
Fay Carmody

2009
Aileen Swarbrick
Olga Mirmikidis
Athene Mathison
Fay Miriklis
Muriel Boyd
Christine Bailey

2010
Suan Williams
Karen Fresson

2011
Rosemary Cooper
Janice O'Neil
Mai Luu
Doreen Halvorson
Susan Knight
Jennifer Parker
Chantel Woodard
Rebecca Trent

2012
Leeanne Finlayson
Caroline Olivier

Chantel Woodard, volunteering at Hillarys Women's Triathlon.

Volunteering is a fulfilling way to give back to the community.

Information on our volunteering program is available at www.wirf.com.au/volunteer

OUR HEARTFELT THANKS TO ALL OUR SUPPORTERS

» WE HAVE RECEIVED OVERWHELMING SUPPORT FROM THE COMMUNITY AND ORGANISATIONS IN 2011/12. THE CONTRIBUTIONS DONATED TO US RANGE FROM HAND SEWN PREMMIE BABY CLOTHES, CROCHETED AND KNITTED BABYWEAR AND MONETARY DONATIONS FROM INDIVIDUALS AND ORGANISATIONS THROUGHOUT WESTERN AUSTRALIA. NO MATTER HOW LARGE OR SMALL THESE CONTRIBUTIONS ARE THEY ARE RECEIVED WITH SINCERE THANKS AND GREAT APPRECIATION.

TELETHON

Channel 7 Telethon Trust has supported WIRF since our beginnings. We appreciate Telethon's support, and in 2011 their generosity extended across five crucial research studies. All of these studies are essential to women and infants health. Detailed reports on each study can be found within this document.

Preterm Birth Prevention – Fighting Fetal Infection

Research to discover an antibiotic that will effectively cross through the placenta and kill bacteria.

Voice Study

Many preterm baby survivors have difficulties with their voice. Such difficulties may arise from the fact that a tube has been placed through their larynx for many of the early weeks of their life. Telethon has provided funding to perform appropriate speech studies that will help develop strategies to reduce voice problems in the future.

Fetal Futures Program – Diaphragmatic Hernia

One of the most severe birth defects is a hole in the diaphragm causing the stomach, intestines and liver to move up into the chest. With Telethon's support we are conducting lung, heart and brain function tests on babies with this condition and the information gained will help us to plan future treatments.

Family Preterm Genetics Study

With Telethon's support we are performing the first Australian study of genetics in families with preterm birth across three generations - the child, the mother, the father, aunts and the grandmother.

Mother's Anxiety Study

A screening test has been developed to identify anxiety during pregnancy and soon after birth. This study is measuring its effectiveness. Positive results will see the test rolled out into clinical practice for use throughout Western Australian and elsewhere.

McCARTNEY GYNAECOLOGICAL CANCER RESEARCH AND EDUCATION FUND

The McCartney Gynaecological Cancer Research and Education Fund was established to commemorate the life and work of Professor Tony McCartney who sadly passed away on 22nd of October, 2011 after a brief cancer-related illness.

Professor Tony McCartney (dec), honoured through the establishment of the McCartney Gynaecological Cancer Research and Education Fund.

McCUSKER FOUNDATION

Tonya and Malcolm McCusker generously provided the intial funding to fire up the Gynaecologic Cancer Research Centre Campaign. The centre is being developed to help find a cure for gynaecologic cancer by integrating clinical services and research.

FAI AND WENNY WANG

Proprietors of the Grand Palace Restaurant generously used their last day of trading to help raise money for the Gynaecologic Cancer Research Centre. This opportunity saw their loyal customers and WIRF supporters come together for the 'Last Supper' and charity auction before the building was demolished to make way for the new Perth Foreshore.

BHP BILLITON

The Family Meeting Place Project is kindly funded by BHP Billiton. The project is a development on the hospital site designed for Aboriginal patients and their families to meet during their stay at King Edward Memorial Hospital.

LIONS INTERNATIONAL

Our Laboratories receive financial support on an annual basis from Lions International for the purchase of essential laboratory equipment such as plate readers, perfusion monitors, autoclaves and electrophoresis equipment.

CASH & CARRY

Thanks to the generosity of Cash and Carry customers in Balcatta, Canning Vale and Bunbury. Their contributions to the My Community Program helped raise $11,348 towards research at the Women and Infants Research Foundation.

Three of our WIRF participants in the 2012 Hillarys Women's Triathlon; Liz Nathan, Angela Jacques and Tina Williams

TRIEVENTS

WIRF became partners of the Hillarys Women's Triathlon event in February 2012. It is a great match for WIRF as we both promote good health. Trievents help to raise donations through participant registrations and donations over the weekend.

CROWE HORWATH

We gratefully acknowledge the pro bono provision of financial auditing and accounting services provided by Crowe Horwath for the 2011/12 financial year. This support is very important for our continuing financial viability and productivity and we are very grateful for the provision of these essential services on an honorary basis.

Friends Arne, Stephen and Adam help raise funds for WIRF at the Perth Corporate Triathlon Challenge

COMMUNITY FUNDRAISERS

WIRF has received some terrific support from online fundraisers. The exciting and innovative ideas keep flowing from Arne's Perth Corporate Triathlon challenge with friends Steve and Adam to Pen's Promise Walk for Frankie. We have received fantastic support from past patients and keen supporters who want to give back and involve their friends and families as well.

OUR HEARTFELT THANKS TO OUR DONORS

OUR SINCERE THANKS GO TO OUR DONORS LISTED BELOW AND TO THOSE WHO WISH TO REMAIN ANONYMOUS:

Adenan, Nenda
Airey, Belinda and Warwick
Allanson, Emma
Allgrove, Catherine
Alvarez, Leonardo
Anderson, Katherine
Ando, Dom and Nicole
Antonelli, Carlo & Sandra
Arkell, Cecily
Armstrong, Kirsty
Artesian Capital Management (Aust) PL
Ashworth, Jo
Astill, Helen
Baillie, Sally
Bains, Claire
Balfour, Yatiha
Banz, Kelly
Barker, Lynda
Barrow, Janine
Barrow, Lin
Bates, Amber
Bates, Marion
Bayley, David and Marion
Beale, Jenny
Bell, Michael
Bender, Michele
Bennett, John and Christine
Benniman, Rachel
Bertolino, Carly
Betta Electrical and Gas, Subiaco
Betts, Ann
Beyond Tools
BHP Billiton
Bilick, Dione
Black, Margaret
Bonannella, Val
Borland, Dorothy
Bower, Caroline
Brake, Sandy
Bremner, Renai
Brennan, Lisa
Bright, Dan
Brookman, Tegan
Brown, Barbara
Brown, Christine
Buchan, Emma
Buckland, Cordia
Budden, Elizabeth
Buller, Sam
Bullock, Clare
Bunnings Innaloo
Burnham, Lyn
Buser, Juanita
Bushell, Gaye
Butcher, Rebecca
Calder, Cecilia
Cammarano, Gennaro
Campbell, Dean and Donna
Campbell, Karen
Cargo, Alex
Carlshausen, Merrie
Carpenter, Tamara
Carrington-Jones, Ann
Carrivick, Alexandra
Carroll, Lara
Caruso, Karina
Casale, Laurie & Sue
Cash and Carry
Chadd, Caroline
Chan, Catherine
Chandler, Simon
Charlesworth, Kate
Chatfield, brenton
Cheang, Wai Pheng
Cheney, Lucy
Childs, Jacinta
Chown, Rebecca
Cimetta, Barbara
Clapham, Mark
Clarke, Simon
Clarke, Stuart
Clegg, Doreen
Clifford, Jeremy
Climo, Glenn
Cole, Andrea
Coleman, Rhonda
Collins, Wylie
Commonwealth Bank
Condon, Margaret
Connery, Loretta
Costaras, Christos
Coumbe, Betty
Cox, Dean
Crompton, B
Crook, Andrew
Crossley, Kylie
Crothers, David & Julie
Crozier, Jason
Cruickshank, Gaye
Cunningham, Hugh
Curtis, Lynda
D'Amelio, Anthony
D'Orsogna, Luigi and Ann
Dade, Emma
Dalton, Maureen
Davies, Margaret
Davies, Matt
Davison, Steven
Dawson, Craig and Julie
Day, Adrian
de Nicola, Anthony
de Rooy, Sander
de Vos, Arne
de Vos, Hinke
de Vos, Michael
de Vos, Onno
de Vos, Rowena
de Vos, Tineke
de Wit, Kaye
Delizia Pizza & Pasta
Delroy, Terrie
Demaio, Rocco
Di Paolo, Julia
Diamond, Lexi
Dicker, Barbara
Dickinson, Jan
Dodd, Loraine
Doherty, Dorota
Donahue, Dorothy
Dorman, Bev
Douglas, Dominique
Doust, Carina
Downey, Peter
Downey, R & F
Doyle, Anthony
Drain, Eve
Drew, Anne
Dry, Brendan
Dudley, Nicholas
Duncan, Kim
East Victoria Park Pharmacy
Egan, Matt
Egerton-Warburton, Grey
Everson, Paul
Fairbairn, Pauline
Farrell, Louise
Farrington, Kim
Fassom, Basil
Fazari, Immacolata
Fisher, Rebecca
Flett, Sue
Flude, Paul
Forbes, Melanie
Forsyth, Ron
Fossey, Matthew
Foster, Anna
Foster, Brian
Fowler, Rosina
Fox, Andrew and Janiene
Fragomeni, Carl
Fragomeni, Roma
Fredericks, Anita
French, Noel
Frost, Geoff
Gan, Kenson
Gan, Leslie
Gardner, Pete
Garrett, Andrea
Garton, Janet
George, J and J
Geraghty, Sadie
Gill, Maureen
Donnybrook Community
Giuffre, Rebecca
Goad, Julie
Goff, Marina
Good, Alan
Goodwin, Linc and Ali
Goodwin, Penny
Goollelal Primary School
Gosatti, Faith
Graham, Penny
Grand Palace
Granich, Susana
Grant, Erica
Grasa, Anna
Green, Margaret
Green, Stephanie
Grzelec, Peta
Gundry, Nola
Gunnell, Chris
Gunning, Kylie
Gynaenorth
Hammer, Amy
Hammond, Ian
Hammond, Kate
Hng, Paul
Hanley, John
Hanson, Kerry
Hardie, Nicole
Harris, Faamama
Harris, Julia
Harrison, Sofie
Hart, Roger
Hartleys Limited
Harvey, Andrew
Haskell, Dennis
Havlik, Jenny
Hawley, Michael
Hayers, Richard
Hayes, Bev
Hedland, Carissa
Hedland, Deanne
Heller, Martin
Henderson, Dilip
Henderson, Mardi
Henry, David
Herbert, Brian
Hewett, Maureen
Hill, Andrew
Hill, Felicity
Hindley, Deborah
Hng, Paul
Ho, Tessa Pei Ru
Ho, Twe-Hong
Hodgson, Emma
Holman, Amanda
Holt, Samantha
Hooper, Garnet
Hornbuckle, Janet
Hudson, Stacey
Hyde, Suzanne
Imron, Mary
IMS Health
In't Veld, Jackie
Incontro Restaurant
Indian Ocean Capital
Inner Wheel Club of Wann-Gara
Isherwood, Karen
Jackson, Troy
Jamieson, Elly
Jeffery, Timothy
Jenner, Rachel
Jennings, Grace
Johnson, Marie-Anne
Jones, Belinda
Josham, Monica
Journet, Susan
Kailis, Margot
Kaitse, Kelley
Kalimeris, M
Karczub, Anne
Karthigasu, Krish
Kazmer, Clint
Keall, Sharon
Keenan, Marc
Kerr, Paula
Kershaw, D
Knight, Sal
Knight, Sam
Kok, Yen
Kordys, Tina
Kridelka, Frederic
Krishnan, Shobana
Kujda, Erika
Kuruppu, Indraji
Kwok, Roger
Kyle, Katie
Lafferty, Sabrina
Laffin, Erin
Lalani, Harkiran
Lambert, Jules
Lambo, Ade
Larsen, Rebecca
Larsen, Renae
Leaver, Carol
Leen, Jennifer
Lees, Jennifer
LemonTree Home and Gift Store
Leonard, Anisia
Lester, Natalie
Leung, Laraine
Leung, Yee
Lewis, Sally
Ley, Steve and Hannah
Ligovich, Amanda
Ligovich, Lucie
Ligovich, Peter
Lim, Paul
Linde, Marcel
Lindquist, John
Lindquist, Thalina
Linton, Robert
Lions District 201 W1
Litis, Jim
Litopoulos, Evy
Loffler, Ben
Loftus, Brad
Lowe, Phillip
Lu, Raquel
Ludgerus, Liesl
Luzar, Elizabeth
MACA Ltd
MacArthur, Lachlan
Madeley Ladies
Mahon, Jasper
Makin, Frank & Ivy
Malley, Sharon
Malpeli, Elaine
Manickum, Prega
Mann, Elise
Manolas, Emma
Marks, David
Marshall, Jennifer
Martin, John

Martyn, Gaile
Marzo, Amanda
Masters, Rachel
Matthews, Tom
Matula, Linda
MBT Footwear Pty Ltd
McCorkill, Ron
McCreary, Kate
McCreery, Dani
McCullem, J
McCusker Foundation
McFadyen, Andrew
McGill, Gwenda
McGlashan, Hamish
McGovern, Annette
McGregor, Di
McHenry, Chaise
McLeod, Gemma
McMillan, Helen
MCPBB Pty Ltd
McQueen, Gregor
McRandal, Kim
McRobbie, Johanna
Mercanti, Parris
Michael, Ken & Julie
Milankov, Alex
Milanovic, Katica
Miles-Jones, Debra
Milward, Kristy
Mitchell, Ann
Mitchell, Lyle and Sara
Mitchell, Tim
Mohen, Diane
Mookz Contracting Services
Moore, Louisa
Moraday, Glenda
Morey, Samantha
Morgan, Mary-Jo
Morris, Mark
Morrissey, Fiona
Morrissey, Kerry
Moullin, Jamie & Anita
Muir, Fat
Muir, Sharon
Mulroy, Seonaid
Murphy, Amanda
Murphy, Norah
Murray, Jeff
Musbah, Adam
Musbah, Maria
Musbah, Yasmine
Naismith, Connie
Nash, Judith
Nash, Rob and Sue
Nedlands Golf Club Ladies
Newnham, John
Newnham, Susie
Newton, James
Newton, Melanie
NIC Christmas Fund
Nicklin, James
Niddam, Jocelyn
Nixon, Alice
Nixon, Melanie
O'Brien, Donal
O'Connor, Angela
O'Connor, Crystal
O'Connor, Kathleen
O'Connor, Liam
O'Connor, Sue
O'Dowd, Jackie
Oliver, Ray & Linda
Orifici, Dannielle
Orr, Kenneth
Osborn, June
Overton, John
Owen, Jenny
Page, Hannah
Painter, Anna
Palermo Chartered Accountants
Paling, Eric
Panton, Andrea
Papa, Cieto and Gaby
Parin, Judy
Parish, J
Parker, Jennifer
Parker, Jill
Patane, Stella
PathWest
Patterson, Steven
Payne Solicitors
Pelczar, Suzanne
Pengelly, Jodie
Peterson, Lisa
Petrie, Melissa
Philipp, Hjalmar
Phillips, Daniel
Philpott, Colin and Margaret
Phua, Alice
Pintaudi, Anthony
Pirone, Adelina
Poole, Samantha
Popova, Milena
Pratt, Andrew
Prigg, Ryan
Pudney, Rebecca
Pugliese, Fiorello and Melissa
Pursey, Melissa
Raad, David
Rabone, Fiona
Radford, Peter and Georgina
Radin, Grey and Deb
Radnidge, Kristen
RANZCOG
Ratcliffe, Ethel
Rate, Angela
Re Store, Northbridge
Reed, T and H
Rendell, Carly
Rhys-Jones, Elizabeth
Richards, Anita
Ritoli, Ross
Rochester, Cameron
Roddick, Emma
Rose, Bronwyn
Rumball, Kirk
Rushton, Rebecca
Russell-Weisz, David
Safe, Jennifer
Saleeba, Michael
Salfinger, George
Salfinger, Stuart
Santos, S
Sarter-Robertson, Gavin
Sayer, Melanie
Sberna, Genny
Schoch, Barry
Schofield, Lynette
Science and Engineering, Curtin University
Schurer-de Vos, Homme en Hielkje
Seah, Julian
Sealanes
Seretis, E
Sessions, Blair
Sevicke-Jones, Maggie
Seymour, Sarah
Sharpe, Teresa
Shellabear, Erica
Short, Allyssa
Siu, J
Skubel, Andrew
Slabber, Marty
Slater, Eunice
Smith, Emma
Smits, Eileen
Smyth, Hal and Laureen
Spasich, James
Spencer, Christine
Spooner, Mairead
Sprungli, Delphine
Stanley, Morwenna
Stanley, T
Steicke, Brad
Stillbirth Foundation Australia
Stockden, Emily
Stoner, Tim
Strezos, Maria
Sullivan, Helen
Sully, Michelle
Summerhayes, J
Swan Valley Spinners
Tai, Richard
Tan, Jason
Tan, Jeremy
Tan, Jll
Tan, Kurt
Tang, Amy
Tang, Andrew
Tannock, Carolyn
Tatasciore, Fabio and Melissa
Taylor, Irene
Taylor, Travis
Teasdale, Chris
Tedesco, Shantel
Telstra Triathlon Series
Tennyson, Andrew
Teo, Angelo
Textile Traders and Staff
Thake, Nick
The Alternative Centre
The Lemon Tree
Thiel, Barbara
Thoday, Ted and Maura
Thorburn, Wendy
Thornton, Bev
Tsagalis, Jim
Turner, Simon
Van Der Meulen, Rebecca
van Linde, Rena and Karin
Verboom, Katharine
Viska, Annette
Voss, Ellen
Vujic, Tara
WA Charity Direct
Wai, L
Walden, Joanna
Walker, Ronnie
Wallace, Elisha
Wallis, Sophie
Walsh, Deborah
Warburton, Grey
Ward, Michelle
Ward, Sarah
Warren, Grace
Watson, Deana
Watts, Dominic
Wedge, Leoni
Wellby, Diana
White, Evelyn
White, Karen
White, Victor
Whiting, Jim
Whyte, Melissa
Wiese, Damyon and Lisa
Wiese, Glenys
Willers, Joanne
Williams, Lucy
Williams, Raelene
Williams, Tina
Wills, Lorette
Wilson, Celeste
Wilson, Julie
Winton, Trevor
Wong, Andrea
Wood, Julie
Woodhouse Contracting
Workforce Policy and Coordination
Worner, John and Deirdre
Xanthis, Adam
Yang, Kent
Yao, Shih-Em
Yoga, Krisadi
Young, Sharon

EXTERNAL RESEARCH GRANTS AFFILIATED WITH THE WOMEN AND INFANTS RESEARCH FOUNDATION

The Women and Infants Research Foundation provides the infrastructure and funding to allow our researchers to successfully compete for external grants from organisations such as the National Health & Medical Research Council. Following is a list of competitive grants supported during the current financial year ending 30 June 2012:

National Health & Medical Research Council (NHMRC) (Australia)

- EARLY LIFE ORIGINS OF IMPAIRED TESTICAL FUNCTION – A PROSPECTIVE COHORT STUDY — $241,427
  Principal Investigator: R Hart (2010-2012 $600,313)
- A GENOME-WIDE SEARCH FOR GENES UNDERLYING THE DEVELOPMENTAL ORIGINS OF HEALTH & DISEASE — $58,290
  Investigators: L Palmer, C Pennell, L Beilin, J Newnham, S Lye, G Davey Smith (2009-2011 $989,000)
- PREVENTING GESTATIONAL DIABETES MELLITUS USING A HOME-BASED SUPERVISED EXERCISE PROGRAM DURING PREGNANCY (The Cycle Study) — $269,130
  Investigators: J Newnham, P Fournier, K Guelfi, J Grove, K Wallman, D Doherty (2011-2013 $740,709)
- EFFECTIVE TREATMENT OF UREAPLASMA TO PREVENT PRETERM BIRTH — $220,972
  Investigators: J Newnham, J Keelan, A Jobe (2011-2013 $676,732)
- CONSEQUENCES OF WAVEFORM COMPOSITION FOR EPITHELIAL INTEGRITY & HOMOGENOUS VENTILATION DURING HFOV — $137,194
  Investigators: J Pillow, G Pinniger, A Bakker (2011-2013 $395,697)
- INFLUENCE OF IN UTERO ENVIRONMENT ON DIAPHRAGM STRUCTURE AND FUNCTION — $158,192
  Investigators: J Pillow, G Pinniger, A Bakker (2011-2013 $478,365)
- EARLY CAREER FELLOWSHIP – REGULATION OF PULMONARY RESPONSIVENESS BY CHRONIC MECHANICAL STRAIN AND ITS ROLE ON OBSTRUCTIVE LUNG DISEASE — $93, 093
  Investigator: P Noble (2008 – 2011 $283,050)
- INTRA AMNIOTIC THERAPIES FOR PRETERM BIRTH — $85,220
  Investigators: J Keelan, J Newnham, A Charles, M Kemp (2012 – 2014 $548,675)

National Institute of Health (USA) (via Cincinnati Childrens Hospital Medical Centre)

- MECHAMISMS OF FETAL SYSTEMIC INFLAMMATORY RESPONSE SYNDROME INDUCED BY CHORIOAMNIONITIS. — $93,083
  Investigators: S Kallapur, J Newnham, A Jobe (2009- 2013 $452,505)
- LATE PRETERM BIRTH UREAPLASMA SPECIES AND CHILDHOOD LUNG DISEASE. — $148, 631
  Investigators: A Jobe, S Kallapur, C Chougnet, J Acton, B Kramer, C Knox, J Newnham, J Pillow (2009- 2011 $219,205)

Canadian Institutes of Health Research (CIHR)

- GENE-ENVIRONMENT INTERACTIONS UNDERLYING THE DEVELOPMENTAL ORIGINS OF HEALTH & DISEASE. — $Nil
  Investigators: S Lye, C Pennell (2010-2014 $872,734)
- A MURINE MODEL TO INVESTIGATE THE MECHANISMS UNDERLYING DOHaD. *Investigators:* S Lye, C Pennell (2009-2014) — $Nil

The University of Sydney (ex NHMRC)

- CHILDHOOD DETERMINANTS OF RISKY SEXUAL BEHAVIOUR IN ADOLESCENCE: A PROSPECTIVE COHORT STUDY. — $40,470
  Investigators: R Skinner, M Hickey, E Mattes, D Doherty, S Rosenthal, A Smith, S Cooper. (2010-2012 $154,000)

The University of Sydney / The University of Melbourne

- EXPLORING THE BIOPSYCHOSOCIAL ANTECEDENTS OF TEENAGE PREGNANCY – A QUANTITATIVE STUDY. — $13,682
  Investigators: R Skinner, M Hickey, D Doherty

The University of Adelaide (ex NHMRC)

- THE DINO TRIAL FOLLOW UP — $13,800
  Investigators: K Simmer, M Makrides, N French (2012 $49,200)

Sylvia & Charles Viertel Charitable Foundation

- SENIOR MEDICAL RESEARCH FELLOWSHIP – UNDERSTANDING THE RELEVANCE OF BIOLOGICAL COMPLEXITY AND FRACTAL STRUCTURES FOR VENTILATION OF THE PRETERM LUNG. *Principal Investigator:* J Pillow (2007 – 2011 $975,000) — $97,500

Clive & Vera Ramaciotti Foundation

- NEUTRALISING ANTIBODY THERAPY AS A PREVENTATIVE TREATMENT FOR PRETERM BIRTH. *Investigator:* M Kemp (2010 $50,000) — $24,419

Financial Markets Foundation for Children

- INFLAMMATION OF THE FETAL SKIN – A POTENTIAL MEDIATOR OF PRETERM BIRTH. *Investigators:* J Keelan, M Kemp (2010 - 2011 $90,000) — $25,000

Peter MacCallum Cancer Institute

- AUSTRALIAN OVARIAN CANCER STUDY (AOCS). *Investigators:* Y Leung, D Bowtell, A Green, A de Fazio (2001 – 2011 $84,000) — $10,409

Department of Health – WA

- MEDICAL AND HEALTH INFRASTUCTURE FUND (MHRIF). *Researchers:* J Newnham, C Pennell, J Pillow (2012) — $234,341
- NEW INDEPENDENT RESEARCHER INFRASTUCTURE SUPPORT *Researcher:* M Kemp (2012) — $10,000
- STATE HEALTH RESEARCH ADVISORY COUNCIL (SHRAC) - NEBULISED SURFACTANT TO RELIEVE RESPIRATORY DISTRESS SYNDROME IN BABIES TREATED WITH NASAL CPAP *Researchers:* J Pillow, S Minocchieri, R Hagan (2010 $126,476) — $19,085

Australian Gynaecological Endoscopy and Surgery Society

- A PROSPECTIVE OBSERVATIONAL STUDY OF THE EFFECT OF OVARIAN CYSTECTOMY ON OVARIAN RESERVCE (THE SOCOR STUDY). *Investigators:* K Karthigasu, R Hart, B McElhinney, A Beard ($20,000) — $20,000

Australian Placental Transfusion Study (ex NHMRC)

- APTS ECHO SUBSTUDY: TO DETERMINE THE EFFECT OF PLACENTAL TRANSFUSION VS EARLY CLAMPING ON SYSTEMIC BLOOD FLOW. *Investigators:* J Newnham, K Simmer, A Gill (2012 $115,000) — $ 57,500

Stillbirth Foundation Australia

- MIFEPRISTONE AND MISOPROSTOL COMPARED WITH MISOPROSTOL ALONE FOR INDUCTION OF LABOUR FOLLOWING MIDTRIMESTER FETAL DEMISE. *Investigators:* J Dickinson, B Jennings (2012 $46,970) — $23,970

Commercial Research Support

- MERCK SERONO AUSTRALIA – Testicular Ultrasound. *Investigator:* R Hart (2010 – 2011) — $9,000

Direct Research Expenditure by the Women and Infants Research Foundation

The Foundation provides financial support for researchers by direct funding of the Research Starter Grant Program, as well as infrastructure support for the external research grants outlined above. As detailed in the Foundation's Financial Statements, the total "monetary" value of this support for the financial year ended 30 June 2012 was: $1,108,420

Total Research Support for 2011 / 2012 **$3,212,828**


RAB 4-8L/OB
MI 0.9
Fetal Fotos 3D 4D First Photo
10019-11-12-18-16
5.6/10.7cm / 1.2Hz
TIs 0.2
18.12.2011 02:56:58 PM
Default
Th30/Qual max
B70°/V65°
Mix40/60
4D Real Time
6.5 sec

WOMEN & INFANTS RESEARCH FOUNDATION INC.
FINANCIAL STATEMENTS 30 JUNE 2012

INCOME STATEMENT FOR THE YEAR ENDED 30 JUNE 2012

	2012	2011
	$	$
Revenue	2,889,252	2,910,920
Depreciation Expenses	-209,308	-189,086
Research Grants Approved	-159,426	-188,878
Other Research Expenses	-1,138,895	-1,385,275
Administration Expenses	-347,857	-318,656
Trading Activities - cost of goods sold and other expenses	-1,045,835	-1,036,974
Finance Costs	-11,173	-8,965
Profit on Disposal of Financial Assets	-	84,990
Profit / (Loss) before income tax	**-23,242**	**-131,924**
Income Tax Expense	**-**	**-**
Profit / (Loss) for ordinary activities for the year	**-23,242**	**-131,924**

BALANCE SHEET AS AT 30 JUNE 2012

	2012	2011
	$	$
CURRENT ASSETS		
Cash and Cash Equivalents	623,411	261,853
Trade and Other Receivables	549,018	311,558
Inventories	34,337	34,136
Other Current Assets	183,856	29,275
TOTAL CURRENT ASSETS	**1,390,622**	**636,822**
NON-CURRENT ASSETS		
Financial Assets	4,005,005	4,092,688
Property Plant and Equipment	879,003	936,020
TOTAL NON-CURRENT ASSETS	**4,884,008**	**5,028,708**
TOTAL ASSETS	**6,274,630**	**5,665,530**
CURRENT LIABILITIES		
Trade and Other Payables	2,350,804	1,435,925
Short Term Provisions	113,043	95,642
TOTAL CURRENT LIABILITIES	**2,463,847**	**1,531,567**
NON-CURRENT LIABILITIES		
Long Term Provisions	34,674	45,531
TOTAL NON-CURRENT LIABILITIES	**34,674**	**45,531**
TOTAL LIABILITIES	**2,498,521**	**1,577,098**
NET ASSETS	**3,776,109**	**4,088,432**
EQUITY		
Retained Earnings	3,087,548	3,130,697
Reserves	688,561	957,735
TOTAL EQUITY	**3,776,109**	**4,088,432**

A full copy of the Foundation's audited general purpose financial report for the year ended 30 June 2012 is available at **www.wirf.com.au**

PUBLICATIONS IN PEER REVIEW SCIENTIFIC JOURNALS

PUBLICATIONS IN PEER REVIEW SCIENTIFIC JOURNALS (JULY 2011 – DECEMBER 2011)

Al-Jumaily, A.M., Reddy, P.I., Bold, G.T., Pillow, J. Pressure oscillation delivery to the lung: Computer simulation of neonatal breathing parameters. *Journal of Biomechanics*, 44(15): 2649-58 (2011)

Andersen, C.C., Pillow, J.J., Gill, A.W., Allison, B.J., Moss, T.J.M., Hooper, S.B., Nitsos, I., Kluckow, M., Polglase, G.R. The cerebral critical oxygen threshold of ventilated preterm lambs and the influence of antenatal inflammation, *Journal of Applied Physiology*, 111(3):775-81 (2011)

Artigas, M.S., Loth, D.W., Wain, L.V., Gharib, S.A., Obeidat, M., Tang, W., Zhai, G., Zhao, J.H., Smith, A.V., Huffman, J.E., Albrecht, E., Jackson, C.M., Evans, D.M., Cadby, G., Fornage, M., Manichaikul, A., Lopez, L.M., Johnson, T., Aldrich, M.C., Aspelund, T., Barroso, I., Campbell, H., Cassano, P.A., Couper, D.J., Eiriksdottir, G., Franceschini, N., Garcia, M., Gieger, C., Gislason, G.K., Grkovic, I., Hammond, C.J., Hancock, D.B., Harris, T.B., Ramasamy, A., Heckbert, S.R., Heliövaara, M., Homuth, G., Hysi, P.G., James, A.L., Jankovic, S., Joubert, B.R., Karrasch, S., Klopp, N., Koch, B., Kritchevsky, S.B., Launer, L.J., Liu, Y., Loehr, L.R., Lohman, K., Loos, R.J.F., Lumley, T., Al Balushi, K.A., Ang, W.W., Barr, R.G., Beilby, J.P., Blakey, J.D., Boban, M., Boraska, V., Brisman, J., Britton, J.R., Brusselle, G.G., Cooper, C., Curjuric, I., Dahgam, S., Deary, I.J., Ebrahim, S., Eijgelsheim, M., Francks, C., Gaysina, D., Granell, R., Gu, X., Hankinson, J.L., Hardy, R., Harris, S.E., Henderson, J., Henry, A., Hingorani, A.D., Hofman, A., Holt, P.G., Hui, J., Hunter, M.L., Imboden, M., Jameson, K.A., Kerr, S.M., Kolcic, I., Kronenberg, F., Liu, J.Z., Marchini, J., McKeever, T., Morris, A.D., Olin, A.-C., Porteous, D.J., Postma, D.S., Rich, S.S., Ring, S.M., Rivadeneira, F., Rochat, T., Sayer, A.A., Sayers, I., Sly, P., Smith, G.D., Sood, A., Starr, J.M., Uitterlinden, A.G., Vonk, J.M., Wannamethee, S.G., Whincup, P.H., Wijmenga, C., Williams, O.D., Wong, A., Mangino, M., Marciante, K.D., McArdle, W.L., Meibohm, B., Morrison, A.C., North, K.E., Omenaas, E., Palmer, L.J., Pietiläinen, K.H., Pin, I., Pola‰ek, O., Pouta, A., Psaty, B.M., Hartikainen, A.-L., Rantanen, T., Ripatti, S., Rotter, J.I., Rudan, I., Rudnicka, A.R., Schulz, H., Shin, S.-Y., Spector, T.D., Surakka, I., Vitart, V., Völzke, H., Wareham, N.J., Warrington, N.M., Wichmann, H.-E., Wild, S.H., Wilk, J.B., Wjst, M., Wright, A.F., Zgaga, L., Zemunik, T., Pennell, C.E., Nyberg, F., Kuh, D., Holloway, J.W., Boezen, H.M., Lawlor, D.A., Morris, R.W., Probst-Hensch, N., Kaprio, J., Wilson, J.F., Hayward, C., Kähönen, M., Heinrich, J., Musk, A.W., Jarvis, D.L., Gläser, S., Järvelin, M.-R., Ch Stricker, B.H., Elliott, P., O'Connor, G.T., Strachan, D.P., London, S.J., Hall, I.P., Gudnason, V., Tobin, M.D. Genome-wide association and large-scale follow up identifies 16 new loci influencing lung function, *Nature Genetics*, 43(11):1082-90 (2011)

Audette, M.C., Challis, J., Jones, R.L., Sibley, C.P., Matthews, S.G. Antenatal Dexamethasone Treatment in Midgestation Reduces System A-Mediated Transport in the Late-Gestation Murine Placenta, *Endocrinology*, 152(9):3561-70 (2011)

Berry, C.A., Nitsos, I., Hillman, NH, Pillow, J.J., Polglase, G.R., Kramer, BW, Kemp, M.W., Newnham, J.P., Jobe, A., Kallapur, S.G. Interleukin 1 in Lipopolysaccharide Induced Chorioamnionitis in the Fetal Sheep, *Reproductive Sciences*,18(11):1092-102 (2011)

Carmody, D.F., Tregonning, A.M., Nathan, E, Newnham, J.P. Patient perceptions of medical students' involvement in their obstetrics and gynaecology health care, *Australian and New Zealand Journal of Obstetrics and Gynaecology*, 51(6):553-8 (2011)

Chui, A., Evseenko, D.A., Brennecke, S.P., Keelan, J.A., Kalionis, B., Murthi, P. Homeobox gene Distal-less 3 (DLX3) is a regulator of villous cytotrophoblast differentiation, *Placenta*, 32(10):745-51 (2001)

Deshpande, G.C., Rao, S.C., Keil, A.D., Patole, S.K. Evidence-based guidelines for use of probiotics in preterm neonates, *BMC Medicine*, 9:92 (2011)

Dickinson, J.E. Methods to counter scientific misconduct in medical journals: Text-matching software programs, *Australian and New Zealand Journal of Obstetrics and Gynaecology*, 51(4):287-8 (2011)

Dickinson, J.E. ANZJOG in 2011, *Australian and New Zealand Journal of Obstetrics and Gynaecology*, 51(6):477-8 (2011)

Ferreira, M, Matheson, M, Duffy, D, Marks, G, Hui, J, Le Souef, P.N., Danoy, P, Baltic, S., Nyholt, D, Jenkins, M, Hayden, C, Willemsen, G, Ang, W.W., Kuokkanen, M, Beilby, J, Cheah, F, de Geus, E, Ramasamy, A, Vedantam, S, Salomaa, V, Madden, P, Heath, A, Hopper, J, Visscher, P, Musk, B, Leeder, S, Jarvelin, MR, Pennell, C.E., Boomsma, D, Hirschhorn, J, Walters, H, Martin, N, James, A.L., Jones, G, Abramson, M, Robertson, C, Dharmage, S, Brown, M, Montgomery, G, Thompson, P.J. Identification of IL6R and chromosome 11q13.5 as risk loci for asthma, *The Lancet*, 378(9795):1006-14 (2011)

Foulkes, W.D., Bahubeshi, A., Hamel, N., Pasini, B., Asioli, S., Baynam, G.S., Choong, C.S., Charles, A.K., Frieder, R., Dishop, M., Graf, N., Ekim, M., Soglio, D. B-D., Arseneau, J., Young, R.H., Sabbaghian, N., Srivastava, A., Tischkowitz, M.D., Priest, J.R. Extending the phenotypes associated with DICER1 mutations, *Human Mutation*, 32(12):1381-4 (2011)

Gracie, S., Pennell, C., Ekman-Ordeberg, G., Lye, S., McManaman, J., Williams, S., Palmer, L., Kelley, M., Menon, R., Gravett, M. An integrated systems biology approach to the study of preterm birth using "-omic" technology - a guideline for research, *BMC Pregnancy and Childbirth*, 11:71 (2011)

Hall, G.L., Logie, K.M., Parsons, F., Schulzke, S., Nolan, G., Murray, C., Ranganathan, S., Robinson, P., Sly, P., Stick, S. Air Trapping on Chest CT Is Associated with Worse Ventilation Distribution in Infants with Cystic Fibrosis Diagnosed following Newborn Screening, *PLOS One*, 6(8):e23932 (2011)

Henderson, J.J., Pennell, C.E., Dickinson, J.E. Transcervical Foley catheter should be used in preference to intravaginal prostaglandins for induction of labor with an unfavorable cervix, *American Journal of Obstetrics & Gynecology*, 205(1):e19-20 (2011)

Hillman, N.H., Nitsos, I., Berry, C., Pillow, J.J., Kallapur, S.G., Jobe, A.H. Positive end-expiratory pressure and surfactant decrease lung injury during initiation of ventilation in fetal sheep, *American Journal of Physiology - Lung Cellular and Molecular Physiology*, 301(5):L712-20 (2011)

PUBLICATIONS IN PEER REVIEW SCIENTIFIC JOURNALS (JULY 2011 – DECEMBER 2011) *CONTINUED*

» **Kallapur, S.G., Kramer, BW, Knox, CL, Berry, C.A., Collins, JJP, Kemp, M.W., Nitsos, I., Polglase, G.R., Robinson, J, Hillman, NH, Newnham, J.P., Chougnet, C, Jobe, A.** Chronic fetal exposure to Ureaplasma parvum suppresses innate immune responses in sheep, *Journal of Immunology*, 187(5):2688-95 (2011)

Kallapur, SG, Kramer, BW, Nitsos, I, Pillow, JJ, Collins, JP, Polglase, GR, Newnham, JP, Jobe, AH. Pulmonary and systemic inflammatory responses to intra-amniotic IL-1· in fetal sheep, *American Journal of Physiology-Lung Cellular and Molecular Physiology*, 301(3):L285-95 (2011)

Keelan, J.A., Aye, I., Mark, P.J., Waddell, B.J. ABCA1 and placental cholesterol efflux, *Placenta*, 32(9):708-9 (2011)

Kemp, M.W., Saito, M., Kallapur, S.G., Jobe, A., Keelan, J.A., Li, S., Kramer, B.W., Zhang, L., Knox, C, Yaegashi, N., Newnham, J.P. Inflammation of the Fetal Ovine Skin Following in utero Exposure to Ureaplasma parvum, *Reproductive Sciences*, 18(11):1128-37 (2011)

Kroon, B, Hart, RJ. The management of fibroids and polyps In: How To Improve Your ART Success Rates ed. Gab Kovacs, *Cambridge University Press*, pp16 – 21 (2011)

Kunzmann, S., Collins, J.J.P., Yang, Y., Uhlig, S., Kallapur, S.G., Speer, C.P., Jobe, A.H., Kramer, B.W. Antenatal inflammation reduces expression of caveolin-1 and influences multiple signaling pathways in preterm fetal lungs, *American Journal of Respiratory Cell and Molecular Biology*, 45(5):969-76 (2011)

Liu, L., Xie, N., Rennie, P., Challis, J.R.G., Gleave, M., Lye, S.J., Dong, X. Consensus PP1 binding motifs regulate transcriptional corepression and alternative RNA splicing activities of the steroid receptor coregulators, p54nrb and PSF, *Molecular Endocrinology*, 25(7):1197-210 (2011)

Magann, E.F., Doherty, D.A., Chauhan, S.P., Klimpel, J.M., Huff, S.D., Morrison, J.C. Pregnancy, obesity, gestational weight gain, and parity as predictors of peripartum complications, *Archives of Gynecology and Obstetrics*, 284(4):827-36 (2011)

McClure, E.M., Pasha, O., Goudar, S.S., Chomba, E., Garces, A., Tshefu, A., Althabe, F., Esamai, F., Patel, A., Wright, L.L., Moore, J., Kodkany, B.S., Belizan, J.M., Saleem, S., Derman, R.J., Carlo, W.A., Hambidge, K.M., Buekens, P., Liechty, E.A., Bose, C., Koso-Thomas, M., Jobe, A.H., Goldenberg, R.L. Epidemiology of stillbirth in low-middle income countries: A Global Network Study, *Acta Obstetricia et Gynecologica Scandinavica*, 90(12):1379-85 (2011)

Md Zin, R.R., Phillips, M., Edwards, C., Murch, A.R., Charles, A.K. Perilobar Nephrogenic Rests and Chromosome 22, *Pediatric and Developmental Pathology*, 14(6):485-92

Meldrum, S.J., D'Vaz, N., Dunstan, J.A., Mori, T.A., Prescott, S.L. The Infant Fish Oil Supplementation Study (IFOS): Design and research protocol of a double-blind, randomised controlled n?3 LCPUFA intervention trial in term infants, *Contemporary Clinical Trials*, 32(5):771-8 (2011)

Netto, J.D., Musk, G.C., Maker, G.L., Trengove, R.D. Liquid chromatography tandem mass spectrometry for the simultaneous quantitative analysis of ketamine and medetomidine in ovine plasma, *Biomedical Chromatography*, 25(12):1374-80

Newnham, J.P. Preterm birth in Chinese women - Reply letter, *Australian and New Zealand Journal of Obstetrics and Gynaecology*, 51:567 (2011)

Newnham, J.P., Sahota, D.S., Zhang, CY, Xu, B, Zheng, M, Doherty, D.A., Li, S., Chung, T, Hu, Y. Preterm birth rates in Chinese women in China, Hong Kong and Australia - The price of Westernisation, *Australian and New Zealand Journal of Obstetrics and Gynaecology*, 51(5):426-31 (2011)

Paech, M.J., Doherty, D.A., Christmas, T., Wong, C.A. The volume of blood for epidural blood patch in obstetrics: A randomized, blinded clinical trial, *Anesthesia and Analgesia*, 113(1):126-33 (2011)

Pillow, J.J., Musk, G.C., McLean, C.M., Polglase, G.R., Dalton, R.G.B., Jobe, A.H., Suki, B. Variable ventilation improves ventilation and lung compliance in preterm lambs, *Intensive Care Medicine*, 37(8):1352-9 (2011)

Putnam, K., Magann, E.F., Doherty, D.A., Poole, A.T., Magann, M.I., Warner, W.B., Chauhan, S.P. Randomized clinical trial evaluating the frequency of membrane sweeping with an unfavorable cervix at 39 weeks, *International Journal of Women's Health*, 3:287-94 (2011)

Raval, A.D., Hunter, T., Stuckey, B, Hart, R.J. Statins for women with polycystic ovary syndrome not actively trying to conceive, *Cochrane Database of Systematic Reviews*, Oct 5;(10):CD008565 (2011)

Resnick, S.M., Jacques, A., Patole, S.K., Simmer, K.N. Does after-hours in-house senior physician cover improve standard of care and outcomes in high-risk preterm neonates? A retrospective cohort study, *Journal of Paediatrics and Child Health*, 47(11):795-801 (2011)

Rye, M.S., Wiertsema, S.P., Scaman, E.S.H., Oomen, J., Sun, W., Francis, R., Ang, W., Pennell, C.E., Pennell, C.E., Burgner, D.P., Richmond, P.C., Vijayasekaran, S., Coates, H.L., Brown, S.D., Blackwell, J., Jamieson, S. FBXO11, a regulator of the TGFb pathway, is associated with severe otitis media in Western Australian children, *Genes and Immunity*, 12(5):352-9 (2011)

Simmer, K.N., Patole, S.K., Rao, S. Longchain polyunsaturated fatty acid supplementation in infants born at term, *Cochrane Database of Systematic Reviews* Issue 2. Art. No.: CD000375 (2011)

Webster, R.J., Carter, K.W., Warrington, N.M., Loh, A.M., Zaloumis, S., Kuijpers, T.W., Palmer, L.J., Burgner, D.P. Hospitalisation with infection, asthma and allergy in kawasaki disease patients and their families: Genealogical analysis using linked population data, *PLoS One*, 6(11):e28004 (2011)

Adams LA, Marsh JA, Ayonrinde OT, Olynyk JK, Ang WQ, Beilin LJ, Mori T, Palmer LJ, Oddy WW, Lye SJ, Pennell CE. Cholesteryl ester transfer protein gene polymorphisms increase the risk of fatty liver in females independent of adiposity. *Journal of Gastroenterology and Hepatology*. 2012 Mar 13. [Epub ahead of print] PubMed PMID: 22414273.

Akl N, Coghlan EA, Nathan EA, Langford SA, Newnham JP. Aeromedical transfer of women at risk of preterm delivery in remote and rural Western Australia: Why are there no births in flight? *Australian and New Zealand Journal of Obstetrics and Gynaecology.* 2012 Apr 11. [Epub ahead of print]

Belizán JM, McClure EM, Goudar SS, Pasha O, Esamai F, Patel A, Chomba E, Garces A, Wright LL, Koso-Thomas M, Moore J, Althabe F, Kodkany BS, Sami N, Manasyan A, Derman RJ, Liechty EA, Hibberd P, Carlo WA, Hambidge KM, Buekens P, Jobe AH, Goldenberg RL. Neonatal Death in Low- to Middle-Income Countries: AGlobal Network Study. *American Journal of Perinatology*. 2012 May 29. [Epub ahead of print] PubMed PMID: 22644832.

Boraska V, Day-Williams A, Franklin CS, Elliott KS, Panoutsopoulou K, Tachmazidou I, Albrecht E, Bandinelli S, Beilin LJ, Bochud M, Cadby G, Ernst F, Evans DM, Hayward C, Hicks AA, Huffman J, Huth C, James AL, Klopp N, Kolcic I, Kutalik Z, Lawlor DA, Musk AW, Pehlic M, Pennell CE, Perry JR, Peters A, Polasek O, St Pourcain B, Ring SM, Salvi E, Schipf S, Staessen JA, Teumer A, Timpson N, Vitart V, Warrington NM, Yaghootkar H, Zemunik T, Zgaga L, An P, Anttila V, Borecki IB, Holmen J, Ntalla I, Palotie A, Pietiläinen KH, Wedenoja J, Winsvold BS, Dedoussis GV, Kaprio J, Province MA, Zwart JA, Burnier M, Campbell H, Cusi D, Smith GD, Frayling TM, Gieger C, Palmer LJ, Pramstaller PP, Rudan I, Völzke H, Wichmann HE, Wright AF, Zeggini E. Genome-wide association study to identify common variants associated with brachial circumference: a meta-analysis of 14 cohorts. *PLoS One*,(3):e31369 (2012)

Bradfield JP, Taal HR, Timpson NJ, Scherag A, Lecoeur C, Warrington NM, Hypponen E, Holst C, Valcarcel B, Thiering E, Salem RM, Schumacher FR, Cousminer DL, Sleiman PM, Zhao J, Berkowitz RI, Vimaleswaran KS, Jarick I, Pennell CE, Evans DM, St Pourcain B, Berry DJ, Mook-Kanamori DO, Hofman A, Rivadeneira F, Uitterlinden AG, van Duijn CM, van der Valk RJ, de Jongste JC, Postma DS, Boomsma DI, Gauderman WJ, Hassanein MT, Lindgren CM, Mägi R, Boreham CA, Neville CE, Moreno LA, Elliott P, Pouta A, Hartikainen AL, Li M, Raitakari O, Lehtimäki T, Eriksson JG, Palotie A, Dallongeville J, Das S, Deloukas P, McMahon G, Ring SM, Kemp JP, Buxton JL, Blakemore AI, Bustamante M, Guxens M, Hirschhorn JN, Gillman MW, Kreiner-Møller E, Bisgaard H, Gilliland FD, Heinrich J, Wheeler E, Barroso I, O'Rahilly S, Meirhaeghe A, Sørensen TI, Power C, Palmer LJ, Hinney A, Widen E, Farooqi IS, McCarthy MI, Froguel P, Meyre D, Hebebrand J, Jarvelin MR, Jaddoe VW, Smith GD, Hakonarson H, Grant SF; Early Growth Genetics Consortium. A genome-wide association meta-analysis identifies new childhood obesity loci. *Nature Genetics*, 44(5):526-31 (2012)

Chua W, Boothroyd C, Walls M, Hart RJ. Slow freeze versus vitrification for embryo cryopreservation (Protocol) *Cochrane Database of Systematic Reviews*, Issue 1 CD009589 (2012)

Cook TJ, Qiu CC, Dickinson JE. A review of the contemporary management of fetal and neonatal alloimmune thrombocytopenia in an Australian tertiary obstetric hospital. *Australian and New Zealand Journal of Obstetrics and Gynaecology*, 2012 Apr 17. doi: 10.1111/j.1479-828X.2012.01438.x. [Epub ahead of print]

Costello MF, Misso ML, Wong J, Hart R, Rombauts L, Melder A, Norman RJ, Teede HJ. The treatment of infertility in polycystic ovary syndrome: a brief update. *Australian and New Zealand Journal of Obstetrics and Gynaecology*. 2012 May 28. doi: 10.1111/j.1479-828X.2012.01448.x. [Epub ahead of print]

Crowe A, Keelan JA. Development of a Model for Functional Studies of ABCG2 (Breast Cancer Resistance Protein) Efflux Employing a Standard BeWo Clone (B24). *ASSAY and Drug Development Technologies*. 2012 Jun 8. [Epub ahead of print]

Dando SJ, Nitsos I, Kallapur SG, Newnham JP, Polglase GR, Pillow JJ, Jobe AH, Timms P, Knox CL. The role of the multiple banded antigen of Ureaplasma parvum in intra-amniotic infection: major virulence factor or decoy? PLoS One, 7(1):e29856 (2012)

Dickinson JE. Increasing maternal age and obstetric outcomes. *Australian and New Zealand Journal of Obstetrics and Gynaecology*, 52(3):217-9 (2012)

Goudar SS, Carlo WA, McClure EM, Pasha O, Patel A, Esamai F, Chomba E, Garces A, Althabe F, Kodkany B, Sami N, Derman RJ, Hibberd PL, Liechty EA, Krebs NF, Hambidge KM, Buekens P, Moore J, Wallace D, Jobe AH, Koso-Thomas M, Wright LL, Goldenberg RL. The Maternal and Newborn Health Registry Study of the Global Network for Women's and Children's Health Research. *International Journal of Gynaecology and Obstetrics*. 2012 Jun 25. [Epub ahead of print] PubMed PMID: 22738806.

Hart R. Periodontal disease: could this be a further factor leading to subfertility and is there a case for a prepregnancy dental check-up? *Womens Health*, 8(3):229-30 (2012)

Hart R, Doherty DA, Pennell CE, Newnham IA, Newnham JP. Periodontal disease: a potential modifiable risk factor limiting conception. *Human Reproduction*, 27(5):1332-42 (2012)

Henderson JJ, McWilliam OA, Newnham JP, Pennell CE. Preterm birth aetiology 2004-2008. Maternal factors associated with three phenotypes: spontaneous preterm labour, preterm pre-labour rupture of membranes and medically indicated preterm birth. *Journal of Maternal-Fetal and Neonatal Medicine*, 25(6):642-7 (2012)

Howe LD, Matijasevich A, Tilling K, Brion MJ, Leary SD, Davey Smith G, Lawlor DA. Maternal smoking during pregnancy and offspring trajectories of height and adiposity: comparing maternal and paternal associations. *International Journal of Epidemiology*, 2012 Mar 9. [Epub ahead of print] PubMed PMID: 22407859

PUBLICATIONS IN PEER REVIEW SCIENTIFIC JOURNALS (JANUARY 2012 – JUNE 2012) *CONTINUED*

Hunter TJ, Byrnes MJ, Nathan E, Gill A, Pennell CE. Factors influencing survival in pre-viable preterm premature rupture of membranes. *Journal of Maternal-Fetal and Neonatal Medicine*. 2012 Mar 16. [Epub ahead of print] PubMed PMID: 22339558.

Ikram MA, Fornage M, Smith AV, Seshadri S, Schmidt R, Debette S, Vrooman HA, Sigurdsson S, Ropele S, Taal HR, Mook-Kanamori DO, Coker LH, Longstreth WT Jr, Niessen WJ, DeStefano AL, Beiser A, Zijdenbos AP, Struchalin M, Jack CR Jr, Rivadeneira F, Uitterlinden AG, Knopman DS, Hartikainen AL, Pennell CE, Thiering E, Steegers EA, Hakonarson H, Heinrich J, Palmer LJ, Jarvelin MR, McCarthy MI, Grant SF, St Pourcain B, Timpson NJ, Smith GD, Sovio U; Early Growth Genetics Consortium, Nalls MA, Au R, Hofman A, Gudnason H, van der Lugt A, Harris TB, Meeks WM, Vernooij MW, van Buchem MA, Catellier D, Jaddoe VW, Gudnason V, Windham BG, Wolf PA, van Duijn CM, Mosley TH Jr, Schmidt H, Launer LJ, Breteler MM, DeCarli C; Cohorts for Heart and Aging Research in Genomic Epidemiology Consortium. Common variants at 6q22 and 17q21 are associated with intracranial volume. *Nature Genetics*, 44(5):539-44 (2012)

Jobe AH. What is RDS in 2012? *Early Human Development*, 88 Suppl 2:S42-4. (2012)

Jobe AH. What is BPD in 2012 and what will BPD become? *Early Human Development*, 88 Suppl 2:S27-8

Kamath-Rayne BD, MacGuire ER, McClure EM, Goldenberg RL, Jobe AH. Clinical algorithms for the identification of sick newborns in community-based settings. Acta Paediatrica, 101(4):344-51 (2012)

Kemp MW, Kallapur SG, Jobe AH, Newnham JP. Obesity and the developmental origins of health and disease. *Journal Paediatrics and Child Health*. 48(2):86-90 (2012)

Kondalsamy-Chennakesavan S, Janda M, Gebski V, Baker J, Brand A, Hogg R, Jobling TW, Land R, Manolitsas T, Nascimento M, Neesham D, Nicklin JL, Oehler MK, Otton G, Perrin L, Salfinger S, Hammond I, Leung Y, Sykes P, Ngan H, Garrett A, Laney M, Ng TY, Tam K, Chan K, Wrede DH, Pather S, Simcock B, Farrell R, Robertson G, Walker G, McCartney A, Obermair A. Risk factors to predict the incidence of surgical adverse events following open or laparoscopic surgery for apparent early stage endometrial cancer: Results from a randomised controlled trial. *European Journal of Cancer*. 2012 Apr 12. [Epub ahead of print] PubMed PMID: 22503396.

Kondalsamy-Chennakesavan S, Yu C, Kattan MW, Leung Y, Sykes P, Nascimento M, Nicklin J, Perrin L, Crandon A, Chetty N, Land R, Garrett A, Obermair A. Nomograms to predict isolated loco-regional or distant recurrence among women with uterine cancer. *Gynecologic Oncology*, 125: 520-525(2012)

Kroon, B., Hart, R.J., Wong, B.M.S., Yazdani, A. Antibiotics prior to embryo transfer in ART. *Cochrane Database of Systematic Reviews* Mar 14;3: CD008995 (2012)

Kuypers E, Collins JJ, Jellema RK, Wolfs TG, Kemp MW, Nitsos I, Pillow JJ, Polglase GR, Newnham JP, Germeraad WT, Kallapur SG, Jobe AH, Kramer BW. Ovine fetal thymus response to lipopolysaccharide-induced chorioamnionitis and antenatal corticosteroids. *PLoS One*, 7(5):e38257 (2012)

Kuypers E, Collins JJ, Kramer BW, Ofman G, Nitsos I, Pillow JJ, Polglase GR, Kemp MW, Newnham JP, Gavilanes AW, Nowacki R, Ikegami M, Jobe AH, Kallapur SG. Intra-amniotic LPS and antenatal betamethasone: inflammation and maturation in preterm lamb lungs. *American Journal of Physiology: Lung Cellular and Molecular Physiology*, 302(4):L380-9 (2012)

Li S, Nitsos I, Polglase GR, Braun T, Moss TJ, Newnham JP, Challis JR. The effects of dexamethasone treatment in early gestation on hypothalamic-pituitary-adrenal responses and gene expression at 7 months of postnatal age in sheep. *Reproductive Sciences*, 19(3):260-70 (2012)

Mackey DA, Warrington NM, Hewitt AW, Oates SK, Yazar S, Soloshenko A, Crawford GJ, Mountain JA, Pennell CE. Role of the TCF4 gene intronic variant in normal variation of corneal endothelium. *Cornea*, 31(2):162-6 (2012)

McGurgan PM Clinical pathways and guidelines: a plea for professional independence. *Medical Journal of Australia*, 196(9):567 (2012)

Meldrum SJ, D'Vaz N, Casadio Y, Dunstan JA, Niels Krogsgaard-Larsen N, Simmer K, Prescott SL. Determinants of DHA levels in early infancy: Differential effects of breast milk and direct fish oil supplementation. *Prostaglandins Leukotrienes and Essential Fatty Acids*, 86(6):233-9 (2012)

Meldrum SJ, D'Vaz N, Simmer K, Dunstan JA, Hird K, Prescott SL. Effects of high-dose fish oil supplementation during early infancy on neurodevelopment and language: a randomised controlled trial. *British Journal of Nutrition*, 21:1-12. (2012)

Middelberg RP, Benyamin B, de Moor MH, Warrington NM, Gordon S, Henders AK, Medland SE, Nyholt DR, de Geus EJ, Hottenga JJ, Willemsen G, Beilin LJ, Mori TA, Wright MJ, Heath AC, Madden PA, Boomsma DI, Pennell CE, Montgomery GW, Martin NG, Whitfield JB. Loci affecting gamma-glutamyl transferase in adults and adolescents show age x SNP interaction and cardiometabolic disease associations. *Human Molecular Genetics*, 21(2):446-55 (2012).

Misso ML, Wong JL, Teede HJ, Hart R, Rombauts L, Melder AM, Norman RJ, Costello MF. Aromatase inhibitors for PCOS: a systematic review and meta-analysis. *Human Reproduction Update*, 18(3):301-12 (2012)

Musk GC, Polglase GR, Song Y, Pillow JJ. Impact of conventional breath inspiratory time during high-frequency jet ventilation in preterm lambs. *Neonatology,* 101(4):267-273 (2012)

Myatt L, Eschenbach DA, Lye SJ, Mesiano S, Murtha AP, Williams SM, Pennell CE; International Preterm Birth Collaborative Pathways and Systems Biology Working Groups. A standardized template for clinical studies in preterm birth. *Reproductive Sciences,* 19(5):474-82 (2012)

Obermair A, Janda M, Baker J, Kondalsamy-Chennakesavan S, Brand A, Hogg R, Jobling TW, Land R, Manolitsas T, Nascimento M, Neesham D, Nicklin JL, Oehler MK, Otton G, Perrin L, Salfinger S, Hammond I, Leung Y, Sykes P, Ngan H, Garrett A, Laney M, Ng TY, Tam K, Chan K, Wrede DH, Pather S, Simcock B, Farrell R, Robertson G, Walker G, McCartney A, Gebski V. Improved surgical safety after laparoscopic compared to open surgery for apparent early stage endometrial cancer: results from a randomised controlled trial. *European Journal of Cancer,* 48(8):1147-53 (2012)

Peate M, Meiser B, Cheah BC, Saunders C, Butow P, Thewes B, Hart R, Phillips KA, Hickey M, Friedlander M. Making hard choices easier: a prospective, multicentre study to assess the efficacy of a fertility-related decision aid in young women with early-stage breast cancer. *British Journal of Cancer,* 13;106(6):1053-61 (2012)

Polglase GR, Nitsos I, Baburamani AA, Crossley KJ, Slater MK, Gill AW, Allison BJ, Moss TJ, Pillow JJ, Hooper SB, Kluckow M. Inflammation in utero exacerbates ventilation-induced brain injury in preterm lambs. Journal of Applied Physiology, 112(3):481-9 (2012)

Rich W, Finer NN, Gantz MG, Newman NS, Hensman AM, Hale EC, Auten KJ, Schibler K, Faix RG, Laptook AR, Yoder BA, Das A, Shankaran S; SUPPORT and Generic Database Subcommittees of the Eunice Kennedy Shriver National Institute of Child Health and Human Development Neonatal Research Network. Enrollment of extremely low birth weight infants in a clinical research study may not be representative. *Pediatrics,* 129(3):480-4 (2012)

Rao S, Simmer K. World Health Organization growth charts for monitoring the growth of Australian children: time to begin the debate. *Journal of Paediatrics and Child Health*, 48(2):E84-90 (2012)

Sant'Anna G, Laptook AR, Shankaran S, Bara R, McDonald SA, Higgins RD, Tyson JE, Ehrenkranz RA, Das A, Goldberg RN, Walsh MC; Eunice Kennedy Shriver National Institute of Child Health and Human Development Neonatal Research Network. Phenobarbital and temperature profile during hypothermia for hypoxic-ischemic encephalopathy. *Journal of Child Neurology,*27(4):451-7 (2012)

Shankaran S, Pappas A, McDonald SA, Vohr BR, Hintz SR, Yolton K, Gustafson KE, Leach TM, Green C, Bara R, Petrie Huitema CM, Ehrenkranz RA, Tyson JE, Das A, Hammond J, Peralta-Carcelen M, Evans PW, Heyne RJ, Wilson-Costello DE, Vaucher YE, Bauer CR, Dusick AM, Adams-Chapman I, Goldstein RF, Guillet R, Papile LA, Higgins RD; Eunice Kennedy Shriver NICHD Neonatal Research Network. Childhood outcomes after hypothermia for neonatal encephalopathy. *New England Journal of Medicine*, 366(22):2085-92 (2012)

Singh AT, Dharmarajan A, Aye IL, Keelan JA. Ceramide biosynthesis and metabolism in trophoblast syncytialization. *Molecular and Cellular Endocrinology*. 2012 May 28.[Epub ahead of print] PubMed PMID: 22652149.

Singh AT, Dharmarajan A, Aye IL, Keelan JA. Sphingosine-sphingosine-1-phosphate pathway regulates trophoblast differentiation and syncytialization. *Reproductive Biomedicine Online*, 24(2):224-34 (2012)

Skouen JS, Smith AJ, Warrington NM, O' Sullivan PB, McKenzie L, Pennell CE, Straker LM. Genetic variation in the beta-2 adrenergic receptor is associated with chronic musculoskeletal complaints in adolescents. *European Journal of Pain*. 2012 Mar 13. [Epub ahead of print] PubMed PMID: 22416031

Smith PB, Ambalavanan N, Li L, Cotten CM, Laughon M, Walsh MC, Das A, Bell EF, Carlo WA, Stoll BJ, Shankaran S, Laptook AR, Higgins RD, Goldberg RN; Generic Database Subcommittee; Eunice Kennedy Shriver National Institute of Child Health Human Development Neonatal Research Network. Approach to infants born at 22 to 24 weeks' gestation: relationship to outcomes of more-mature infants. *Pediatrics*, 129(6):e1508-16 (2012)

Song Y, Frey B, Hampson DJ. The use of ELISAs for monitoring exposure of pig herds to Brachyspira hyodysenteriae. *BioMed Central Veterinary Research;* 8(1):6 (2012)

Song Y, Pillow JJ. Ontogeny of proteolytic signaling and antioxidant capacity in fetal and neonatal diaphragm. *Anatomical Record* (Hoboken) 295(5):864-71 (2012)

Stewart LM, Holman CD, Hart R, Bulsara MK, Preen DB, Finn JC. In vitro fertilization and breast cancer: is there cause for concern? *Fertility and Sterility.* 2012 May 17. [Epub ahead of print]

PUBLICATIONS IN PEER REVIEW SCIENTIFIC JOURNALS (JANUARY 2012 – JUNE 2012) *CONTINUED*

Stewart CJR, Leung YC, Whitehouse A Fallopian tube metastases of non-gynaecological origin: a series of 20 cases emphasizing patterns of involvement including intra-epithelial spread. *Histopathology,* 60: E106–E114 (2012)

Stoch YK, Williams CJ, Granich J, Hunt AM, Landau LI, Newnham JP, Whitehouse AJ. Are Prenatal Ultrasound Scans Associated with the Autism Phenotype? Follow-up of a Randomised Controlled Trial. *Journal of Autism and Developmental Disorders*. 2012 Mar 29. [Epub ahead of print]

Strunk T, Simmer K, Burgner D. Prematurity and mortality in childhood and early adulthood. *Journal of the American Medical Association,* 307(1):32; author reply 32-3 (2012)

Strunk T, Doherty D, Jacques A, Simmer K, Richmond P, Kohan R, Charles A, Burgner D. Histologic chorioamnionitis is associated with reduced risk of late-onset sepsis in preterm infants. *Pediatrics,* 129(1): e134-41 (2012)

Taal HR, St Pourcain B, Thiering E, Das S, Mook-Kanamori DO, Warrington NM, Kaakinen M, Kreiner-Møller E, Bradfield JP, Freathy RM, Geller F, Guxens M, Cousminer DL, Kerkhof M, Timpson NJ, Ikram MA, Beilin LJ, Bønnelykke K, Buxton JL, Charoen P, Chawes BL, Eriksson J, Evans DM, Hofman A, Kemp JP, Kim CE, Klopp N, Lahti J, Lye SJ, McMahon G, Mentch FD, Müller-Nurasyid M, O'Reilly PF, Prokopenko I, Rivadeneira F, Steegers EA, Sunyer J, Tiesler C, Yaghootkar H; Cohorts for Heart and Aging Research in Genetic Epidemiology Consortium, Breteler MM, Decarli C, Breteler MM, Debette S, Fornage M, Gudnason V, Launer LJ, van der Lugt A, Mosley TH Jr, Seshadri S, Smith AV, Vernooij MW; Early Genetics & Lifecourse Epidemiology Consortium, Blakemore AI, Chiavacci RM, Feenstra B, Fernandez-Banet J, Grant SF, Hartikainen AL, van der Heijden AJ, Iñiguez C, Lathrop M, McArdle WL, Mølgaard A, Newnham JP, Palmer LJ, Palotie A, Pouta A, Ring SM, Sovio U, Standl M, Uitterlinden AG, Wichmann HE, Vissing NH, DeCarli C, van Duijn CM, McCarthy MI, Koppelman GH, Estivill X, Hattersley AT, Melbye M, Bisgaard H, Pennell CE, Widen E, Hakonarson H, Smith GD, Heinrich J, Jarvelin MR, Jaddoe VW; Early Growth Genetics Consortium. Common variants at 12q15 and 12q24 are associated with infant head circumference. *Nature Genetics,* 15; 44(5):532-8 (2012)

Tkach JA, Hillman NH, Jobe AH, Loew W, Pratt RG, Daniels BR, Kallapur SG, Kline-Fath BM, Merhar SL, Giaquinto RO, Winter PM, Li Y, Ikegami M, Whitsett JA, Dumoulin CL. An MRI system for imaging neonates in the NICU: initial feasibility study. *Pediatric Radiology.* 2012 Jun 27. [Epub ahead of print] PubMed PMID: 22735927.

Tregonning AM, Doherty DA, Hornbuckle J, Dickinson JE. The audience response system and knowledge gain: a prospective study. *Medical Teacher*, 34(4):e269-74 (2012).

Webb TR, Matarin M, Gardner JC, Kelberman D, Hassan H, Ang W, Michaelides M, Ruddle JB, Pennell CE, Yazar S, Khor CC, Aung T, Yogarajah M, Robson AG, Holder GE, Cheetham ME, Traboulsi EI, Moore AT, Sowden JC, Sisodiya SM, Mackey DA, Tuft SJ, Hardcastle AJ. X-linked megalocornea caused by mutations in CHRDL1 identifies an essential role for ventroptin in anterior segment development. *American Journal of Human Genetics*, 90(2):247-59 (2012)

White CR, Doherty DA, Henderson JJ, Kohan R, Newnham JP, Pennell CE. Accurate prediction of hypoxic-ischaemic encephalopathy at delivery: a cohort study. *Journal of Maternal-Fetal and Neonatal Medicine* 2012 Apr 3. [Epub ahead of print]

White CR, Doherty DA, Kohan R, Newnham JP, Pennell CE. Evaluation of selection criteria for validating paired umbilical cord blood gas samples: an observational study. *BJOG: An International Journal of Obstetrics and Gynaecology,*119(7):857-65 (2012)

White, C.R., Mok, T.J., Doherty, D.A., Henderson, J.J., Newnham, J.P., Pennell, C.E. The effect of time, temperature and storage device on umbilical cord blood gas and lactate measurement: a randomized controlled trial. *Journal of Maternal-Fetal and Neonatal Medicine,* 25(6):587-94 (2012)

Whitehouse AJ, Robinson M, Newnham JP, Pennell CE. Do hypertensive diseases of pregnancy disrupt neurocognitive development in offspring? *Paediatric and Perinatal Epidemiology*, 26(2):101-8. (2012)

Whitehouse AJ, Zubrick SR, Blair E, Newnham JP, Hickey M. Fetal head circumference growth in children with specific language impairment. *Archives of Disease in Childhood*, 97(1): 49-51 (2012)

Whitehouse, A.J.O., Bishop, D.V.M., Ang, Q.W., Pennell, C.E., Fisher, S.E. CNTNAP2 variants affect early language development in the general population. *Genes, Brain and Behavior,* 11(4):501 (2012)

Wyckoff MH, Salhab WA, Heyne RJ, Kendrick DE, Stoll BJ, Laptook AR; National Institute of Child Health and Human Development Neonatal Research Network. Outcome of extremely low birth weight infants who received delivery room cardiopulmonary resuscitation. *Journal of Pediatrics*, 160(2):239-244.e2 (2012)

Zhang L, Saito M, Jobe A, Kallapur SG, Newnham JP, Cox T, Kramer B, Yang H, Kemp MW. Intra-Amniotic Administration of E coli Lipopolysaccharides Causes Sustained Inflammation of the Fetal Skin in Sheep. *Reproductive Sciences*, 2012 May 17. [Epub ahead of print].


we can
SHAPE THE FUTURE
through
RESEARCH
DISCOVERY
DEVELOPMENT

women & infants
research foundation
Western Australia

Telephone (08) 9340 1437 | Facsimile (08) 9340 1642
Website www.wirf.com.au | Email info@wirf.com.au

Carson House | King Edward Memorial Hospital
374 Bagot Road | Subiaco | Western Australia | 6008

PO Box 134 | Subiaco | Western Australia | 6904