Staff and Students in ARCH 2011, within The Robinson Institute, The University of Adelaide
ARCH’s VISION

To attain the best health and wellbeing possible for women and their babies through excellence and leadership in research, education and knowledge transfer.

ARCH’s Mission & Strategic Direction

The Australian Research Centre for Health of Women and Babies (ARCH), within The Robinson Institute at The University of Adelaide, is an international centre of excellence in maternal and perinatal research.

Our strategic commitment to research, education and training ensures high quality and timely maternal and perinatal research is conducted, evaluated and translated into clinical practice and health policy. Our research program aims to benefit women and babies by:

★ Answering questions of major importance in the field of maternal and perinatal health, across the spectrum from preconception, through pregnancy and childbirth, infancy and later life;
  o Our major multidisciplinary research themes are:
    ▪ Care before, during and after pregnancy and childbirth
    ▪ Health care and lifestyle interventions during pregnancy and later health
    ▪ Child health after pregnancy and childbirth intervention studies
    ▪ Indigenous maternal and perinatal health
    ▪ International maternal and perinatal health
    ▪ Promoting and supporting evidenced based health care

★ Generating research evidence of the highest quality that promotes the best health possible for all women and their babies;

★ Ensuring that research findings are incorporated into health care practice;

★ Increasing capacity in research synthesis, randomised trials and implementation and translational research through career development and education, locally, nationally, and internationally; and

★ Strengthening our existing collaborations and identifying new international, national and regional collaborations.
ARCH’s Values
As we seek to improve health care to benefit women and babies, the qualities we uphold and emphasise are:

**RELEVANCE**
Research meeting the needs of women and their babies.

**COLLABORATION**
Partners in research with clinicians, researchers, policy makers, consumer and communities.

**INTEGRITY**
Conduct research that is ethical, honest and equitable.

**INNOVATION**
Develop and pursue novel and leading edge research questions and methodologies.

**BUILDING RESEARCH CAPACITY**
Nurture and support researchers for the future.

**PRIORITY**
Address priority research questions.

**LEADERSHIP**
Leaders in maternal perinatal care.

**EXCELLENCE**
In all that we do.
Director’s Report

Welcome to the ARCH Research Report for 2011 ~ an amazingly successful year, completing several landmark projects, generating new, vital health information, initiating new studies and continuing our sustained growth.

ARCH, within The Robinson Institute at The University of Adelaide, has six research divisions; Research Synthesis, Clinical Studies and Trials, Translational Research, Indigenous Maternal and Perinatal Health, Research Networks and Education, and International Maternal and Perinatal Health. All have remained highly productive in 2011 with six new major grants awarded, 13 significant awards, scholarships and fellowships, and 56 peer reviewed publications.

Guided by our strategic initiatives that are aligned with The University of Adelaide, ARCH research leaders and staff provide comprehensive expertise in research methods, clinical care of mothers and babies, study coordination, psychological assessment, data management, statistics, administration, research synthesis and knowledge translation. The effective partnerships within and between the ARCH research groups and other research groups in The Robinson Institute are highly valued as are the significant achievements of individual staff and students.

ARCH continues to enjoy strong, enduring partnerships with researchers and health professionals in key collaborating institutes providing care for women and their babies within Australia, New Zealand and internationally.

Through individual studies, collaborative networks, educational study programs and excellence in leadership, research, education and knowledge translation, members of ARCH are achieving meaningful health benefits for women and babies and their families.

We hope you enjoy reading our 2011 Annual Report.

Professor Caroline A Crowther
Director
Australian Research Centre for Health of Women and Babies (ARCH)
ARCH’s Organisational Structure

Director
Co-Directors and Manager

Research Divisions

Research Leaders

Research Synthesis

Indigenous Maternal and Perinatal Health

Translational Health

Clinical Studies and Trials

International Maternal and Perinatal Health

Research Networks and Education

ARCTURUS

STARS
Research Synthesis Division Report

Aims
To conduct, promote and support the preparation and updating of high quality systematic reviews of the existing evidence on questions of relevance to women and babies in Australia, regionally in South East Asia, and internationally.

We have continued our close and productive relationship with the Cochrane Collaboration; an international organisation committed to providing high quality, independent evidence to inform health care decision-making. Cochrane reviews combine results of the world’s best medical research studies, and are recognised as the gold standard in evidence-based health care.

Australian Review Authors Group for Cochrane Pregnancy and Childbirth Collaboration Review Group

The Australian Review Authors Group for the Cochrane Pregnancy and Childbirth Collaborative Review Group is the official Australian satellite of the Cochrane Pregnancy and Childbirth Group. This satellite, with its national coordinating centre at ARCH, has been funded by the Federal Department of Health and Ageing. In August 2011, funding responsibility was transferred from the Department to the NHMRC. Current Grant: 2009-2012, $180,000.

Support for review authors
This funding is used to support Australians to prepare and maintain Cochrane reviews in maternal and perinatal health. These reviews have major impact by providing evidence for clinical practice, health care policy and for indentifying new research strategies. Dr Emer Heatley, the National Pregnancy and Childbirth Group Cochrane Coordinator, has provided extensive author support during 2011. We actively monitor the progress of over 200 Australian review authors, offering support and encouragement at key stages of review preparation.
**High quality, updated, systematic reviews**

Our Australian review authors contributed to a third of all Pregnancy and Childbirth reviews and protocols published in The Cochrane Library (as of 2011). Over the past year, members of the Cochrane Pregnancy and Childbirth Australian Review Authors Group were involved in preparing 20 new reviews or review updates and 17 new protocols, well on target for our key performance indicators (see publications 2011).

Australia makes a substantial contribution to the editorial work of the Cochrane Pregnancy and Childbirth Group with three of the seven international editors (Professor Caroline Crowther, Professor Jodie Dodd and Chris East) and one of the three associate editors (Philippa Middleton) (as at 2011) being based in Australia.

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**Prestigious International award for Professor Caroline Crowther**

Professor Caroline Crowther was presented with the inaugural Anne Anderson Award at the 19th Cochrane Colloquium in Madrid, Spain in October 2011. The goal of the Anne Anderson Award is to recognise and stimulate individuals contributing to the enhancement of women’s visibility and participation in the Cochrane leadership. The Award is given to a member of The Cochrane Collaboration who has contributed meaningfully to the promotion of women as leaders and contributors to The Cochrane Collaboration.

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**Individual Participant Data (IPD) Meta-analysis: Progress with projects**

**PRECISE Collaboration (Prenatal REpeat Corticosteroid International IPD Study group: assessing the effects using the best level of Evidence)**

We are leading a collaboration (the PRECISE Collaboration (Prenatal REpeat Corticosteroid International IPD Study group: assessing the effects using the best level of Evidence) of 11 international trial groups to clarify which women and babies will benefit most from repeat corticosteroids and what the optimal drug regimen might be. The study entitled “Prenatal Repeat Corticosteroids in women at risk of preterm birth for improving neonatal health - an individual patient data review” has been funded by the NHMRC for three years 2011-2013, $447,281.

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**AMICABLE Collaboration (Antenatal Magnesium IPD International Collaboration: Assessing the Benefits for Babies using the Best Level of Evidence)**

Magnesium sulphate prior to birth increases the chances of preterm babies surviving or preventing cerebral palsy. The AMICABLE Collaboration (Antenatal Magnesium IPD International Collaboration: assessing the benefits for babies using the best level of evidence) is undertaking an individual patient data (IPD) meta-analysis on the use of magnesium sulphate in women at risk of very preterm birth for neuroprotection of the fetus. This patient level analysis will clarify optimal gestational age, timing prior to preterm birth magnesium sulphate should be given, the best dose and regimen to use and which women are most likely to benefit.

The ‘Magnesium sulphate in women at risk of preterm birth for fetal neuroprotection – an individual patient data (IPD)’ was funded by the NHMRC for two years 2010-2011, $268,751.
Cochrane Pregnancy and Childbirth Editorial Meetings

Professor Caroline Crowther and Professor Jodie Dodd attended the international editorial meeting of the Cochrane Pregnancy and Childbirth Group in Liverpool, UK in May 2011.

Professor Caroline Crowther attended the Cochrane Pregnancy and Childbirth Group meeting at the Cochrane Colloquium in Madrid, Spain in October 2011.

Training workshops and meetings to promote systematic reviews and research synthesis

ARCH organised meetings and works-ins around the annual Perinatal Society of Australia and New Zealand (PSANZ) conference in Hobart in April 2011 and used the opportunity to present research syntheses within the body of the PSANZ scientific congress.

Professor Jodie Dodd and Dr Rosalie Grivell held their highly successful workshop teaching resident medical officers and registrars about evidence-based medicine and use of Cochrane reviews through the Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG) training programs.

Research syntheses on causes of stillbirth and interventions to prevent stillbirth

With the Australian and New Zealand Stillbirth Alliance (ANZSA) and International Stillbirth Alliance (ISA), Philippa Middleton co-authored a paper on risk factors for stillbirth in high income countries, as part of an invited series of papers for The Lancet.


This paper was also selected for summary and editorial comment in Obstetrical and Gynecological Survey in 2011.


3ie/AUSAID review on maternal mortality/morbidity and nutrition

ARCH was awarded a highly competitive grant to undertake a research synthesis addressing the role of nutrition in preventing maternal mortality, which relates to Millennium Development Goal 5. We have been joined by colleagues from Vietnam and Pakistan and we are also working with the Campbell Collaboration, a sister organisation to the Cochrane Collaboration. The Campbell Collaboration prepares, maintains and disseminates systematic reviews in education, crime and justice, social welfare and international development.
Clinical Studies and Trials Division

Highlights of 2011

ARCTURUS: Australasian Randomised Collaborative Trials Uniquely aRe US

New Funding Success (Preterm Birth Study Group)

Our new research initiatives are focused around the priority themes of care for women with a high risk pregnancy to improve health outcomes and care around preterm birth.

★ MAGENTA: Magnesium sulphate at 30 to 34 weeks’ gestational age: neuroprotection trial

Babies born very preterm have a greater risk of significant morbidities including neurologic impairments such as cerebral palsy. The risk of morbidity increases with decreasing gestational age at birth. The Cochrane review evaluating the effect of magnesium sulphate on neuroprotection of the fetus shows that magnesium sulphate given to women at risk of imminent preterm birth reduces the risk of cerebral palsy. It remains unclear at which
gestational age treatment will be beneficial. The National Clinical Practice Guidelines on Antenatal Magnesium Sulphate prior to preterm birth for neuroprotection of the fetus, infant and child recommends further randomised trials at 30 weeks’ gestation or more. This had led to the MAGENTA Trial, with over 20 tertiary maternity hospitals planning to participate.

The MAGENTA Trial aims to assess whether giving magnesium sulphate compared with placebo to women immediately prior to preterm birth between 30 and 34 weeks’ gestation reduces the risk of death or cerebral palsy in their children at 2 years’ corrected age.

**Key research staff:** Pat Ashwood, Daniela Gagliardi, Michaela Jarrett, Emily Bain.

**Funding:** NHMRC Project Grant, 2012 – 2016, $1,978,760

**Investigators:** Professor Caroline Crowther, Philippa Middleton, Dr Dominic Wilkinson, A/Professor Ross Haslam.

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**Nine Major Ongoing Randomised Trials/Studies Coordinated By ARCH**

Our nine ongoing major research studies (A*STEROID, CLOSURE, IDEAL, IRIS, LIMIT, MCA Doppler, MPG, PROGRESS, Twins) are evaluating care during pregnancy and childbirth, care around preterm birth and care for women with a multiple pregnancy.
The Preterm Birth Study Group focuses on care prior to birth that can improve the health of babies born preterm. There are currently four multicentered, randomised trials being conducted: MAGENTA, A*STEROID, PROGRESS and IRIS.

★ A*STEROID: Australian antenatal study to evaluate the role of intramuscular Dexamethasone versus Betamethasone prior to preterm birth to increase survival free of childhood neurosensory disability.

Both dexamethasone or betamethasone, given to women at risk of preterm birth, substantially improve neonatal and child health. There are conflicting reports as to whether dexamethasone is better than betamethasone. The aims of this study are to compare the benefits and harms associated with these treatments. This multicentre randomised trial commenced in 2009 with 14 hospitals in Australia and New Zealand participating.

Number of women recruited at 31/12/2011 (of total needed): 838 (1499)

Key research staff: Pat Ashwood (coordinator), Daniela Gagliardi, Sophie Trenowden, Shanshan Han, Lucy Simmonds, Melissa Ewens, Jess Reid, Michaela Jarrett, Kaye Robinson, Caroline Holst

Funding: NHMRC Project Grant, 2009-2013, $1,674,250

Investigators: Professor Caroline Crowther, Professor Jane Harding, Philippa Middleton, Dr Chad Andersen, E/Professor Jeffrey Robinson.

★ IRIS: Different infusion rates of magnesium sulphate before preterm birth for neuroprotection trial

The IRIS trial aims to assess whether a slower infusion rate of the loading dose of magnesium sulphate, as compared with the current recommended rate of infusion, given to women at risk of early preterm birth (less than 30 weeks gestation) will reduce the occurrence of maternal adverse effects.

Number of women recruited at 31/12/2011 (of total needed): 39 (51)

Key research staff: Emily Bain

Investigators: Professor Caroline Crowther and Philippa Middleton.

★ PROGRESS: Progesterone after previous preterm birth for the prevention of neonatal respiratory distress syndrome

Progesterone is involved in maintaining uterine quiescence, and its withdrawal leads to the onset of labour. Although recent reports of progesterone supplementation for women at risk of preterm birth show promise there are currently insufficient data on clinically important outcomes to enable informed decision-making. This international randomised trial is evaluating whether antenatal vaginal progesterone for women who have had a previous preterm birth is effective in reducing the risk of subsequent preterm birth and its associated risk of adverse infant health outcomes.

Number of women recruited at 31/12/2011 (of total needed): 721 (784)

Key research staff: Pat Ashwood (coordinator), Daniela Gagliardi, Michaela Jarrett, Kaye Robinson, Carol Holst

Funding: NHRMC Project Grants, 2006-2009, $1,202,350; 2010-2012, $901,600

Investigators: Professor Caroline Crowther, Professor Jodie Dodd, Dr Andrew McPhee, A/Professor Vicki Flenady, E/Professor Jeffrey Robinson.
Obesity Study Group

The Obesity Study Group is focused on investigating whether lifestyle factors can reduce the risks associated with obesity in pregnancy. Obesity is a significant health issue for women during pregnancy and childbirth, with over 40% of pregnant women being overweight or obese. There are well documented risks associated with obesity during pregnancy and childbirth, maternal complications including hypertensive conditions and pre-eclampsia, gestational diabetes, infection, thromboembolic events, need for induction of labour, caesarean section and perinatal death. Infants of mothers who are overweight or obese are more likely to be macrosomic, require admission to the neonatal intensive care unit, be born preterm, be identified with a congenital anomaly, and to require treatment for jaundice or hypoglycaemia. Obesity is also associated with an increased risk of infertility and worsened child health. Assessment and treatment of obesity-related conditions is therefore a crucial area of research for improving the reproductive, metabolic and psychological health of women and their children.

★ LIMIT: Limiting weight gain in overweight and obese pregnant women to improve pregnancy outcomes: a randomised trial.

While there is an extensive body of literature related to defining the problems and potential complications associated with obesity during pregnancy and childbirth, there is limited information available related to effective interventions that may be implemented to improve maternal and infant health outcomes. The aims of this randomised controlled trial are to assess whether the implementation of a package of dietary and lifestyle advice to overweight and obese pregnant women to restrict weight gain during pregnancy is effective in improving maternal, and infant health outcomes.

Number of women recruited at 31/12/2011 (of total needed): 2212 (2180)

Key research staff: Andrea Deussen (coordinator), Angela Halbyburton, Courtney Cramp, Stephanie Hendrijanto, Joanne Koch, Cath Danz, Robyn Bartley, Ros Stafford-Green, Hannah Deussens, Nogol Salehi, Arianne Webber, Lavern Kannieappan, Kirsten Ball, Caroline Sheppard, Danielle Post, Meredith Kelsey, Kaye Robinson, Caroline Holst, Ellen Lyrtzis.

Funding: NHMRC Project Grant, 2008-2011, $1,466,625; NIH Grant, 2008-2012, $1,313,377; Channel 7 Children's Research Foundation Grant, 2010, $65,000; Clive and Vera Ramaciotti Foundation Grant, 2010, $50,000

Investigators: Professor Jodie Dodd, Professor Deborah Turnbull, Professor Gary Wittert, Dr Andrew McPhee, E/Professor Jeffrey Robinson, Professor Caroline Crowther, Professor Julie Owens, Professor Matthew Gillman.

Obesity related conditions and women’s health:
In 2011, Dr Lisa Moran received national funding from the Heart Foundation of Australia, Diabetes Australia, the Australian Federation of University Women and the Robinson Institute New Directions funding scheme. Dr Moran’s ongoing research interests include assessment of barriers to weight management in women of reproductive age, assessment of dietary intake during pregnancy in overweight women, development of lifestyle interventions for women pre-pregnancy and assessment of metabolic health in mothers and children following lifestyle intervention during pregnancy.
Diabetes Study Group

The Diabetes Study Group focuses on preconceptual, antenatal, intrapartum and postnatal care practices for the prevention and treatment of gestational diabetes, prevention of later maternal type 2 diabetes and later childhood health.

★ IDEAL: Investigation of dietary advice and lifestyle for women with borderline gestational diabetes.

Current clinical practice involves the treatment of women with mild gestational diabetes. It is unclear whether the benefits of similar treatment for women with more borderline gestational glucose intolerance outweigh any harms. The aims of this randomised clinical trial are to assess whether treatment of dietary and lifestyle advice, given to pregnant women who have borderline glucose intolerance on screening for gestational diabetes, reduces neonatal complications without increasing maternal risks.

Number of women recruited at 31/12/2011 (of total needed): 554 (682)

Key research staff: Andrea Deussen (coordinator), Shanshan Han, Stephanie Krawcyzk, Sophie Trenowden, Kaye Robinson, Caroline Holst, Daniela Gagliardi.

Funding: NHMRC Project Grant, 2011-2014, $632,979; Channel 7 Research Foundation, 2007-2009, $94,000

Investigators: Professor Caroline Crowther, Philippa Middleton, A/Professor William Hague, A/Professor Peter Baghurst, Dr Andrew McPhee, Professor Jodie Dodd, E/Professor Jeffrey Robinson.

★ MPG: Metformin in prevention of gestational diabetes

Gestational Diabetes Mellitus (GDM) is a frequent complication of pregnancy, causing increased fetal mortality and perinatal morbidity. Recurrence of GDM has been reported in 30-80% of subsequent pregnancies, the incidence varying with ethnicity. Intervention to make lifestyle changes have been shown to reduce the rate of recurrence of GDM. Previous studies of metformin as a preventive agent for GDM have been conducted in women with polycystic ovary syndrome (PCOS) with mixed results. Some have indicated a tenfold reduction of GDM rate in women taking metformin whilst others showed no benefit. The question of our randomised double blind clinical trial is: will giving metformin early in the second trimester to women with a past history of gestational diabetes reduce the incidence of recurrent gestational diabetes?

Number of women recruited at 31/12/11(of total needed): 5 (266)

Key research staff: Suzette Coat, Shalini Nilajgi

Funding: ADS- Servier National Diabetes Strategy Grant: $31,142

Investigators: Professor William Hague, Professor Robert Norman, Professor Caroline Crowther, Professor Gus Dekker, A/Professor Ross Haslam.
Maternal Fetal Medicine Group

The Maternal Fetal Medicine Group conducts studies of relevance for women with a high risk pregnancy. Often involving assessment of rare events, such trials depend on establishing an effective international network to recruit sufficient numbers of participants.

★ MCA Doppler Study: Fetal middle cerebral artery Doppler velocimetry to determine the timing of second and subsequent fetal blood transfusions in the treatment of fetal anaemia secondary to red cell alloimmunisation – a randomised controlled trial.

Red cell alloimmunisation is estimated to affect 0.1 to 0.6% of all live births. Treatment of the resultant fetal anaemia with intrauterine fetal blood transfusion has been associated with survival rates in excess of 90%. However, intrauterine fetal blood sampling and transfusion is an invasive procedure, with recognised complications, which may result in the need for early birth, and rarely mortality. More recently, reports have emerged utilising Doppler ultrasound to measure the fetal middle cerebral artery (MCA) peak systolic velocity (PSV) to determine the presence of fetal anaemia. Systematic review of the literature has indicated a lack of information from randomised controlled trials comparing this technique with standard measures based on prediction in the rate of fall in the fetal haemoglobin. Clearly, high quality trials are a priority to assess the role of MCA-PSV in determining the timing of second and subsequent fetal intrauterine blood transfusions, and the impact this has on fetal and neonatal morbidity, when compared with current standard care. The aims of this trial are to assess in the fetus where one intrauterine fetal transfusion has been performed for anaemia due to red cell alloimmunisation, whether fetal MCA-PSV can be safely used to determine the timing of second and subsequent fetal blood transfusions, without increasing the risk of adverse fetal and neonatal health outcomes.

Number of women recruited at 31/12/2011: 39

Key research staff: Professor Jodie Dodd, Trish Malbon, Andrea Deussen.

Funding: NHMRC Project Grant, 2010-2012, $473,750

Investigators: Professor Jodie Dodd, A/Professor Jan Dickinson, Dr Chad Andersen, Professor Rory Windrim, Professor Greg Ryan.
**Term Birth Group**

The **Term Birth Group** conducts studies of importance for women and their babies who reach term.

★ **CLOSURE: Skin and subcutaneous fascia closure at caesarean section: a randomised controlled trial.**

This randomised controlled trial is assessing the effects of different methods of skin and subcutaneous fascia closure on maternal wound complication rates. It compares absorbable versus non-absorbable subcuticular suture material for skin closure and closure of subcutaneous fascia versus non-closure.

Key research staff: Dr Rosalie Grivell, Dr Sarah Cash, Dr Elizabeth Beare

Funding: RANZCOG Research Foundation Fotheringham Research Scholarship, $50,000

Investigators: Dr Rosalie Grivell, Professor Jodie Dodd, Professor Caroline Crowther.

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**Multiple Pregnancy Study Group**

The **Multiple Pregnancy Study Group** consists of an extensive network of collaborators committed to undertaking studies to improve the health and wellbeing of mothers with a multiple pregnancy and their babies.

★ **TWINS: Timing of birth at term: a randomised trial.**

This multicentre randomised trial is evaluating the optimal time of birth for women with an uncomplicated twin pregnancy at 37 weeks’ gestation and has completed recruitment in early 2011. Jodie Dodd presented the results at the PSANZ meeting in Hobart in April 2011.

Number of women recruited: 235 – now completing follow-up

Key research staff: Andrea Deussen (coordinator), Melissa Ewens, Kaye Robinson, Caroline Holst.

Funding: Women’s and Children’s Hospital Foundation, 2004

Investigators: Professor Jodie Dodd, Professor Caroline Crowther, A/Professor Ross Haslam, E/Professor Jeffrey Robinson.

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**Active Participation by ARCH in International Collaborative Trials**

★ Control of Hypertension In Pregnancy Study (CHIPS) - coordinated by Dr Laura Magee, University of British Columbia, Canada. Local coordinator, Sophie Trenowden; Local investigators, Professor Caroline Crowther, A/Professor William Hague, Dr Peter Muller.

★ Thrombophilia in Pregnancy Prophylaxis Study (TIPPS) - coordinated by Dr Marc Rodger, Ottawa Hospital Research Institute, Canada. Local and Australian coordinator, Suzette Coat; local and Australian coordinating investigator, Professor Bill Hague.

★ Folic Acid Clinical Trial (FACT) - coordinated by Dr Mark Walker, Ottawa Hospital Research Institute, Canada. Local and Australian coordinator, Suzette Coat; Local and Australian coordinating investigator, Professor Bill Hague.

★ Preterm prelabour rupture of membranes close to term (PPROMT) – coordinated by Professor Jonathan Morris, University of Sydney, Australia. Local coordinator, Pat Ashwood; Local investigator, Professor Caroline Crowther.
**Major Follow Up Studies Underway**

The ongoing follow-up of children born following antenatal interventions is essential to understand the longer-term implications of pregnancy care on infant and childhood development.

Three key multicentre trials, all funded by NHMRC project grants, are underway:

★ **IDEAL follow-up:** Follow up of children at 4 to 12 months of age to assess the effects of dietary advice and lifestyle changes for women with borderline gestational diabetes.

Number of children followed up at 31/12/2011: 95

**Key research staff:** Shanshan Han, Sophie Trenowden, Michaela Jarrett

**Funding:** NHMRC Project Grant, 2011-2014, $632,979; Channel 7 Research Foundation, 2007-2009, $94,000

**Investigators:** Professor Caroline Crowther, Ms Philippa Middleton.

★ **MiG TOFU 6-7:** The Offspring Follow-up: body composition, insulin resistance and development.

The prevalence of obesity and type 2 diabetes is increasing, particularly in younger individuals and there appears to be a causal link with the occurrence of gestational diabetes in the mothers of those affected. It remains unknown as to whether treatment for gestational diabetes with metformin, which crosses the placenta, may impact on the offspring, both in terms of later development of obesity and of the metabolic syndrome, and on their intellectual and psychomotor development. In addition, the effects of metformin on the subsequent risk of diabetes and metabolic syndrome in the mother warrant further investigation. The cohort of mothers and babies from the MiG trial, in which women needing more than lifestyle adjustment to control their hyperglycaemia were randomised to either metformin or insulin, has provided a unique population in which to investigate the issues raised above.

In 2011 studies of body composition of the offspring at 2-3 years of age were published, showing that the children exposed to metformin in utero had larger measures of subcutaneous fat, but that overall body fat was the same as in children whose mothers were treated with insulin alone. Further follow up is required to examine whether these findings persist into later life, and whether children exposed to metformin will develop less visceral fat and be more insulin sensitive. If so, this would have significant implications for the current pandemic of diabetes. (Diabetes Care, 34: 2279, 2011)
The results of the 2-3yr assessment of the cognitive and psychomotor development of the offspring in the Adelaide cohort of the study, were presented as a poster at the ADIPS/SOMANZ conference in November 2011. Whilst this is a preliminary result, it suggested that there is no difference at the age of approximately 33 months in the cognitive and psychomotor development of children exposed to metformin in utero when compared with children whose mothers received insulin.

In 2011, follow up assessment of the children of mothers who took part in the trial and now aged between 6½ and 7½ years has begun. Assessments have included measurements of fasting blood glucose and lipids, and body composition studies (including anthropometry, bioimpedance and dual x-ray absorptiometry), as well as intellectual and psychomotor assessment and physical examination.

**LIMIT**: follow up of children at 6 and 18 months to assess the effect of dietary and lifestyle advice to overweight and obese women during pregnancy to limit weight gain on childhood development.

Number of children followed up at 6 months at 31/12/2011 (of total needed): 931 (1800)

Number of children followed up at 18 months at 31/12/2011 (of total needed): 348 (1800)

**Key research staff**: Andrea Deussen (coordinator), Caroline Sheppard, Danielle Post, Angela Halyburton, Courtney Cramp, Stephanie Hendrijanto, Joanne Koch, Cath Danz, Robyn Bartley, Hannah Deussen, Nogol Salehi, Aurianne Webber, Lavern Kannieppan, Meredith Kelsey, Kaye Robinson, Caroline Holst.

**Investigators**: Professor Jodie Dodd, Professor Deborah Tumbull, Professor Gary Wittert, Dr Andrew McPhee, E/Professor Jeffrey Robinson, Professor Julie Owens, Professor Matthew Gillman, Professor Caroline Crowther.
The Cerebral Palsy Research Group is the world’s premier group investigating the interaction of genetic and environmental causes of cerebral palsy. It is a multidisciplinary group based in ARCH within the Robinson Institute and the University of Adelaide Discipline of Obstetrics and Gynaecology. The group is headed by Professor Alastair MacLennan ably assisted by the members listed below. The group changing name reflects its widening relationships with other Australian researchers as last year it was called the South Australian Cerebral Palsy Research Group and now is the Australian Collaborative Cerebral Palsy Research Group. The group collaborates widely with national and international groups interested in cerebral palsy causation and has again won funding from the NHMRC (2012-14). The Cerebral Palsy Research Foundation (NSW) and Tenix (an Australian industrial group) also support our research.

This year the research group has been collaborating with leading genomic laboratories in the US including Professor Evan Eichler in Washington State University and Professor Christa Martin at Emory University, Atlanta. New links have also been established with Professor Richard Gibbs at Baylor University, Houston. In 2011 Gai McMichael visited all our US collaborators, presented our early findings on copy number variations in children with cerebral palsy and their parents at a major international genetic congress in Montreal and received an invitation to spend two months in the Houston genetic laboratories analysing a new series of our DNA samples. These samples come from our growing biobank of DNA from cerebral palsy families and they are a unique research resource being linked to an extensive epidemiological database. Gai McMichael has submitted her Master of Science thesis and will now progress to a PhD on the new genetics of cerebral palsy.

Dr Michael O’Callaghan won his PhD thesis in 2011 is based on his coordination of the world’s largest gene-association study in cerebral palsy. He obtained 4,320 buccal (cheek) swabs from case and control mother and child pairs along with extensive epidemiological data. The swabs provide DNA for the detection of specific genes of interest. His data provided important insights into the epidemiological and genetic associations with cerebral palsy and his thesis concerns the interaction of genetic susceptibility genes with environmental risk factors such as infection. Michael went on a 6 month Endeavour scholarship to Auckland, New Zealand to further his career in bioinformatics and also help establish a New Zealand Cerebral Palsy Register. Michael will rejoin the Adelaide Cerebral Palsy Research Team in 2012.

Jessica Broadbent and Dr Catherine Gibson have both been on very successful maternity leave in 2011 and rejoin the research team part time in 2012. In the absence of the above three team members we have been greatly supported by Corrine Reynolds who has coordinated our enlarging biobank and database. Samples now come from our research nurse in Perth and we shall be extending this sampling to Sydney and Hobart.

Several papers were published from the group in 2011 with data on both the epidemiological and the genetic associations with cerebral palsy. Professor MacLennan contributed to the national Productivity Commission on the National Disability Insurance Scheme and has published a proposed supplementary pension scheme specifically for cerebral palsy children, which could greatly reduce inappropriate litigation in this area, defensive obstetrics and the high caesarean delivery rate.

Current members of the Australian Cerebral Palsy Research Group are Professor Alastair MacLennan, Professor Eric Haan, Professor Jozef Gecz, Professor Paul Goldwater, Professor Gus Dekker, Dr Catherine Gibson, Jessica Broadbent, Gai McMichael, Dr Michael O’Callaghan, Corrine Reynolds, Kevin Priest, Professor David Adelson, Dr Ray Russo, Dr Suzanna Thompson and Professor Grant Montgomery (Qld). Grateful thanks to all our interstate collaborators especially at the Cerebral Palsy Institute (NSW).
Obstetric Medicine Research Group

The focus of the Obstetric Medicine Research Group is to investigate the effect of treatment of maternal medical disorders, such as gestational diabetes, thrombophilia, and hypertension, on maternal, fetal/neonatal and child health. The ongoing follow-up of the mothers and their offspring from the landmark MiG study, together with the continuing collection of data from women in the TIPPS trial have been our major focus. Data have been published on body composition of the offspring in the MiG trial as well as data addressing the importance of maternal glycaemic control, irrespective of therapy, on the maternal, fetal and neonatal outcomes in women with gestational diabetes. Data have been presented on the impact of metformin on maternal and neonatal B12 metabolism, on the cardiovascular risk factors, including lipids and inflammatory markers, in the offspring, and on the intellectual and psychomotor development of such children.

We have been pleased to welcome Mansi Singh, whose PhD studies under the joint supervision of Professor Hague, Professor Michael Fenech at CSIRO and Professor Julie Owens, will coordinate the investigation of DNA damage markers in offspring in relation to their nutrition, with the studies of the impact of folate supplementation on the development of pre-eclampsia, as well as the potential for epigenetic changes affecting placental, fetal and neonatal growth and development. In addition, we are exploring in a randomised placebo-controlled trial the potential use of metformin in the prevention of recurrent gestational diabetes (the MPG study).

**Current collaborators:** Professor Bill Hague, Professor Julie Owens, Professor Jenny Couper, Professor Michael Fenech, Dr Janet Rowan, Dr Kathy Gatford, Dr Suzette Coat, Dr Shalini Nilaigi, Mansi Singh, Rachel Koszegi, Dr Josie Nozza, Dr Richard Cockington, A/P Professor Ross Haslam, Chris Schultz, A/Professor Barry Chatterton, Dr Zhong Lu, Dr Ken Sikaris, A/Professor Peter Baghurst, Candice Houda.

★★ Folic acid supplementation in the prevention of pre-eclampsia

Pre-eclampsia is a major cause of maternal and fetal morbidity and mortality, affecting 5-7% of all pregnancies. It has been observed that pregnant women who subsequently developed pre-eclampsia had an increased frequency of micronuclei, a biomarker of chromosomal damage in lymphocytes, at 28 weeks’ gestation, compared with low risk pregnant women, who had a subsequent normal outcome. For the fetus, pre-eclampsia can result in preterm delivery, intrauterine growth restriction or stillbirth. Several nutrients may influence the risk of pre-eclampsia.

Recent retrospective studies suggest that folic acid supplementation throughout pregnancy may be protective against pre-eclampsia. The mechanism and effect of folic acid status on both maternal and infant genome integrity have not been extensively investigated. It is well known that breast feeding a baby enhances his/her immunity but whether breast milk protects infants from chromosomal damage relative to alternative feeding is not known. It is therefore proposed to recruit prospectively high risk pregnant women at the Women’s and Children’s Hospital taking part in the FACT (Folic Acid Clinical Trial) study, who have been randomised to take high dose folate or placebo, throughout pregnancy, together with low risk pregnant women from the DaDHI (Diet and DNA Health in Infants) study conducted at CSIRO, Nutrigenomics laboratory, Adelaide, between 16 and 28 weeks’ gestation.

**Number of women recruited as at 31/12/2011** - 89 (all low risk). Recruitment of high risk mothers (120 in treatment and placebo group each) to begin mid 2012.

**Investigators:** Mansi Dass Singh, Professor Bill Hague, Professor Julie Owens, Professor Michael Fenech, Dr Phil Thomas.
Perinatal Ethics and Decision-Making Group

Developments in diagnostic tests and in life-saving interventions raise profound questions for perinatal and neonatal care. A/Professor Wilkinson arrived in Adelaide in early 2011, and has established a new research group, The Perinatal Ethics and Decision-Making Group, investigating the ethical questions arising from advances in perinatology, including the care of fetuses and newborn infants at the borderline of viability, those diagnosed with severe congenital malformations, and those with acquired brain injury. In 2011 he gave invited presentations at the World Congress of Pediatric Critical Care, the Perinatal Society of Australia and New Zealand, the Women’s and Children’s Hospitals of Australasia conference and the Westmead international update on controversies in perinatal care.

He has recently finished a full-length book manuscript, which has been submitted to a major publisher, prepared a briefing paper for the Royal College of Obstetrics and Gynaecology, and was involved in an invited revision of a major clinical guideline for the Royal College of Paediatrics and Child Health. In addition, he was appointed as an associate editor of the BMJ group Journal of Medical Ethics.

Ongoing research projects include:

- the development of a website and handbook to help parents of critically ill newborn infants make decisions about life-sustaining treatment
- guidelines for commencing and discontinuing life-sustaining treatment, and the boundaries of parental discretion in decision making in newborn and paediatric intensive care
- a prospective study of end-of-life decision-making for critically ill children and newborn infants in newborn and paediatric intensive care
- what is the place and potential for tissue and organ donation in newborn intensive care?

A/Professor Wilkinson is also actively involved in the development of teaching resources for clinical ethics committees and ethics teaching for trainees in neonatal-perinatal medicine.

Research Leader: A/Professor Dominic Wilkinson
Indigenous Maternal and Perinatal Health Division

Aims

To continue to expand our collaborations with indigenous organisations and communities to conduct research of relevance for indigenous women and their babies.

Highlights of 2011

ARCH continues to maintain and build its collaborations with indigenous organisations keeping up to date on current issues and policy changes and endeavours to seek collaborative funding opportunities where possible.

New Research Initiatives of 2011

★ Aboriginal Families Study: closing the gap in Indigenous maternal and child health outcomes.

The Aboriginal Families Study is a research study that has been developed in collaboration with the Aboriginal Health Council of South Australia based on state-wide consultations with Aboriginal communities and policy makers in South Australia.

The study aims to collect population level data documenting:

- women's experiences of services during pregnancy, childbirth and the first few months postpartum.
- the social health of Aboriginal women and families during and after pregnancy.

The purpose of collecting this information and conducting the study is to inform development of maternity and postnatal services for Aboriginal women and families in South Australia.

Key research staff: Donna Weetra, Karyn McCue, Roxanne Miller, Jan Wiebe, Hayley Wilson

Funding: NHMRC Project Grant 2011-2014, $950,984

Investigators: A/Professor Stephanie Brown, Dr Jane Yelland, E/Professor Jeffrey Robinson, Karen Glover, Amanda Mitchell, Professor Jonathon Newbury, A/Professor Fiona Arney, Dr Georgina Stamp
Conferences, Presentations and Meetings

- Philippa Middleton participated in the Iga Warta Cultural Awareness Retreat held in the Northern Flinders Range in October 2011.

- Philippa Middleton was invited by the Women's and Children's Health Network to help develop an evaluation framework for the SA Aboriginal Family Birthing Program Framework

- Alice Rumbold, Philippa Middleton and Jessica Reid attended the RANZCOG 2011 Indigenous Women’s Health Meeting held in Cairns, June 3-5 2011. Alice presented her work on antenatal care and infection.

- Philippa Middleton continues as a member of the Reducing Low Birthweight Committee, a group which contributes to the State Strategic Plan. Much of the committee’s work pertains to health of Aboriginal women and their babies.

- Philippa Middleton was invited to give a keynote address on “Reducing disparity in birth outcomes for Aboriginal and teen women” at the Women’s Health Australasia conference held in Adelaide in November 2011.
Aims
To expand our wide collaborative research links within South East Asia and internationally to facilitate maternal and perinatal research, support and education.

Highlights of 2011
South East Asian Maternal Perinatal Research Network

The SEA-URCHIN initiative (South East Asia – Using Research for Change in Hospital-acquired Infection in Neonates) builds on the successful SEA-ORCHID (South East Asia – Optimising Reproductive and Child Health In Developing countries) Project that aimed to build capacity amongst health practitioners in evidence-based maternal and perinatal health.

The first contributors’ meeting was held in Yojyakarta in May 2011.

**SEA-URCHIN: South East Asia – Using Research for Change in Hospital-acquired Infection in Neonates**

**Funding:** NHMRC Project Grant, 2011-2015, $2,179,916

**Investigators:** Professor Sally Green, Professor Heather Jeffrey, Steve McDonald, Dr Monica Lahra, A/Professor Malinee Laopaiboon, Joanne McKenzie, Professor Pisake Lumbiganon, Professor Caroline Crowther.

Joint initiative with four key University institutions in South East Asia and Australia, funded by the NHMRC Wellcome Trust.
SEA-ORCHID
(South East Asia – Optimising Reproductive and Child Health In Developing countries)

Capacity building and evidence based health care in South East Asia.

The burden of mortality and morbidity related to pregnancy and childbirth remains concentrated in developing countries. SEA-ORCHID showed a multifaceted intervention to strengthen capacity for research synthesis, evidence-based care and knowledge implementation and improved adoption of best clinical practice recommendations leading to better health for mothers and babies. In this study we assessed current practices in perinatal health care in four South East Asian countries and determined whether they were aligned with best practice recommendations.

We concluded that recording of clinical practices should be an essential step to improve quality of care. Based on these findings, the SEA-ORCHID project team developed and implemented interventions aimed at increasing compliance with evidence-based clinical practice recommendations to improve perinatal practice in South East Asia. The final publication of the SEA-ORCHID Project shows that this multifactorial intervention was effective in providing evidence-based health care for mothers and babies in these health care settings.

**South East Asia Investigators**

- Professor Mario Festin, Institute of Clinical Epidemiology National Institutes of Health, University of The Philippines, Manila, Philippines.
- Professor Mohammad Hakimi, Gadjah Mada University Faculty of Medicine, Yogyakarta, Indonesia.
- Professor Jackie Ho, University of Penang, Penang, Malaysia.
- Professor Pisake Lumbiganon, Khon Kaen University, Thailand.

**Australian Investigators**

- E/Professor David Henderson-Smart, The University of Sydney.
- Professor Sally Green, Monash University.
- Professor Caroline Crowther, The University of Adelaide.

**Widening our International Network of Collaborators: Undertaking Individual Participant Data Meta-Analyses**

Analysis of thoroughly checked and updated data from individual people in all the available randomised trials has been described as the gold standard in systematic reviews. Estimates of treatment effects are often different from those obtained from aggregate published data due to inclusion of additional or updated data. The methods and advantages of IPD review have been well described.

An integral component of conducting this IPD meta-analysis is the formation of an international collaborative group of trialists where all researchers endorse the IPD protocol and provide data from their trials.

We have established the AMICABLE Collaboration to conduct an IPD on the use of magnesium sulphate prior to preterm birth for neuroprotection of the fetus.

We have established the PRECISE Collaboration to conduct an IPD on the effects of repeat dose of corticosteroids.
Undertaking International Multicentre Trials

★ MCA Doppler Study and PPROMPT Trial
Both of these trials have established a network of researchers and clinicians across Australia, New Zealand, Canada, United States, Argentina, Brazil, United Kingdom, Europe and the Arab States.

Contributing to International Medical Education

★ Working with the International Stillbirth Alliance (ISA) to synthesise and publish evidence about the epidemiology of stillbirth, interventions to prevent stillbirth and implementation research gaps. The work was published as an invited series of papers in The Lancet in 2011 (Philippa Middleton and A/Professor Vicki Flenady).

★ Facilitated workshops for Indonesian trainees at the Bali Fellowship Program in June (Professor Jodie Dodd and Dr Rosalie Grivell).

★ Attended a collaborators meeting in Toronto (Professor Jodie Dodd).

★ Invited visiting Professor Harvard School of Public Health in Boston during April 2011 (Professor Jodie Dodd).

Invited International Presentations and Conferences

★ Invited speaker at the Cerebral Palsy Alliance International Summit in San Francisco in October 2011 where strategies for future cerebral palsy research were generated (Professor Caroline Crowther).
Translational Health Division

Aims
To promote evidence based practice in women’s and babies’ health by the dissemination and implementation of clinical research findings into clinical practice.

Highlights of 2011

Lancet Stillbirth series
Together with Associate Professor Vicki Flenady from Mater Medical Research Institute and other colleagues, Philippa Middleton has been working on an international project investigating the causes of stillbirth, effective interventions to reduce rates of stillbirths, strategies for implementation and determining future research priorities. Part of this work was published in the 2011 Lancet stillbirth series, launched via simultaneous media release in London, New York, Geneva and Hobart. Philippa presented an ‘Indigenous perspective on stillbirth’ at the Hobart launch.

WISH PROJECT

Working to Improve Survival and Health for babies born very preterm
A grant from the Cerebral Palsy Alliance is enabling us to monitor the uptake of antenatal magnesium for fetal, neonatal and infant neuroprotection in Australian tertiary maternity hospitals, as part of the WISH (Working to Improve Survival and Health for babies born very preterm) Project. All tertiary maternity hospitals within Australia and New Zealand with a neonatal intensive care unit have been invited to take part in WISH by forming implementation teams using resources and support mechanisms designed by the research team based in ARCH. Some hospitals are also participating in an audit of women who gave birth at less than 30 weeks’ gestation. The WISH Project will optimise the care of women at risk of imminent early preterm birth and so improve the chances of survival and long term good health for their babies

Key research staff: Tanya Bubner, Melissa Ewens, Dr Emer Heatley, Lucy Simmonds, Emily Bain.

Funding: The Cerebral Palsy Institute Grant, 2011-2013, $274,998

Investigators: Professor Caroline Crowther; Philippa Middleton; A/Professor Vicki Flenady; Professor Jonathan Morris, Sarah McIntyre.
Guideline Development

★ Perinatal Mental Health
As a member of the beyondblue’s Guideline Expert Advisory Committee, Philippa Middleton helped to develop their perinatal mental health guidelines ‘Clinical practice guidelines for depression and related disorders (anxiety, bipolar disorder and puerperal psychosis) in the perinatal period’ were endorsed by NHMRC in early 2011 (see publications 2011). These guidelines are intended for health professionals providing care in the perinatal period and are being implemented throughout Australia as an integral part of the Australian National Perinatal Depression Initiative (www.beyondblue.org.au). The following paper has been published as part of the guideline dissemination process:


★ Dietary guidelines for pregnant and breastfeeding women
Philippa Middleton has been leading a team consisting of Professor Caroline Crowther (ARCH), Dr Carmel Collins, Professor Maria Makrides and Dr Jo Zhou (Child Nutrition Research Centre), Dr Alice Rumbold (Discipline of Obstetrics and Gynaecology at the University of Adelaide), and A/Professor Vicki Flenady (Mater Medical Research Institute in Brisbane) to synthesise the evidence relating to outcomes for dietary intakes of mothers before and during pregnancy and while breastfeeding. This material is informing the overall NHMRC Australian Dietary Guidelines, which were released for public consultation in late 2011.

★ NHMRC Evidence Panel
As well as the synthesising dietary evidence for pregnant and breastfeeding women, ARCH assisted the NHMRC Obesity Guidelines Development Group in establishing its methods and scope. Philippa Middleton was invited to address a NHMRC Meeting on Appropriate Guidance for Clinical Practice Guideline Developers in June 2011.

★ National Institute for Clinical Studies (NICS)
In May 2011, NICS requested Philippa Middleton to train their staff in how to use and apply the NHMRC system “FORM” for formulating and grading guideline recommendations in evidence-based clinical guidelines. Philippa also assisted NICS in a project to assess the uptake and impact of Australian clinical practice guidelines.

★ Perinatal Society of Australia and New Zealand (PSANZ) Clinical Practice Guideline for Perinatal Mortality
Philippa Middleton has been invited to join the Guideline Development Group to update the PSANZ Clinical Practice Guideline for Perinatal Mortality.
Aims
To provide high profile research opportunities by identifying research gaps and defining research questions of major importance in maternal and perinatal health.

Highlights of 2011
Our high-profile program of research training and support in maternal and health for students, early career researchers and health professionals includes:

- The program with RANZCOG coordinated by Jodie Dodd and Rosalie Grivell.
- Cochrane work-ins, and a mentoring program for individual review authors.
- Philippa Middleton was appointed to the beyondblue National Priority Driven Research (NPDR) program Steering Committee in 2011.
- Philippa Middleton was appointed to the Australian and New Zealand Stillbirth Alliance (ANZSA) Research Committee in 2011.
- The Women and Babies Health and Wellbeing: Action through Trials (WOMBAT) Trials Booklet was produced by ARCH staff.

This booklet provides details of all maternal and perinatal trials currently recruiting in Australia, including trials seeking further collaborators and promotes and supports the conduct of high quality randomised trials.

Awards, Scholarships & Fellowships

**Awards**

*Professor Alastair MacLennan*
- Officer of the Order of Australia 2011

*Professor Caroline Crowther*
- International Anne Anderson Award from The Cochrane Collaboration 2011

*Philippa Middleton*
- 2011 Robinson Institute Director’s Award
- Most Outstanding Clinical Paper from the Discipline of Obstetrics and Gynaecology 2011

*Emily Bain*
- Most Outstanding Honours Student, School of Paediatrics and Reproductive Health, Discipline of Obstetrics and Gynaecology 2011

*Gai McMichael*
- Head of Discipline Award, Discipline of Obstetrics and Gynaecology 2011

*Shanshan Han*
- PSANZ 2011 ERC Travel Grant Award

**Scholarships**

*Shanshan Han*
- Robinson Institute PhD Top-up Scholarship, 2011

**ARCH Travel Scholarships**

*Emily Bain*
- ARCH Honours Travel Scholarship 2011

*Shanshan Han*
- ARCH PhD Travel Scholarship 2011

*Dr Emer Heatley*
- ARCH Research Fellow Travel Scholarship 2011

**Fellowships**

*Professor Jodie Dodd*
- NHMRC Practitioner Fellowship 2010-2014

*Dr Lisa Moran*
- Heart Foundation Cardiovascular Research Development Fellowship (Category 1) and SA Health Fellowship 2012-15 ‘Reducing cardiovascular disease in young women of reproductive age and their children’ $450,000
### Research Training Highlights

#### University of Adelaide Medical Student Research Projects

<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Supervisor(s)</th>
<th>Year</th>
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</thead>
<tbody>
<tr>
<td>Debby Utama</td>
<td>&quot;Direct fetal injection of antenatal corticosteroids prior to preterm birth – a Cochrane Review&quot;</td>
<td>C Crowther</td>
<td>2009 - 2011</td>
</tr>
<tr>
<td>Thuy-My Nguyen</td>
<td>&quot;Magnesium sulphate for women at term for neuroprotection of the fetus – a Cochrane Review&quot;</td>
<td>C Crowther, D Wilkinson, E Heatley</td>
<td>2010 - 2011</td>
</tr>
<tr>
<td>Kristin Hsu</td>
<td>&quot;Relaxin for preventing preterm birth in threatened preterm labour &quot;</td>
<td>C Crowther, E Heatley</td>
<td>2010 - 2011</td>
</tr>
<tr>
<td>Kate Martin</td>
<td>&quot;Gestational diabetes amongst women who are overweight and obese&quot;</td>
<td>J Dodd, R Grivell</td>
<td>2011</td>
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</table>

#### Clinical Research Fellows (affiliates)

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<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Supervisor(s)</th>
<th>Year</th>
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<tbody>
<tr>
<td>Asha Short</td>
<td>&quot;Maternal views and knowledge of risks of overweight and obesity in pregnancy&quot;</td>
<td>J Dodd, R Grivell</td>
<td>2009 - 2011</td>
</tr>
<tr>
<td>Casie Staehr</td>
<td>&quot;Effect of maternal obesity on fetal cardiac development as measured by ultrasound&quot;</td>
<td>J Dodd, R Grivell</td>
<td>2009 - 2011</td>
</tr>
<tr>
<td>Nicole Edge</td>
<td>&quot;Clinical care of women who are overweight or obese in pregnancy – a survey of practice of obstetricians and midwives&quot;</td>
<td>J Dodd, R Grivell</td>
<td>2009 - 2011</td>
</tr>
<tr>
<td>Aimee Reilly</td>
<td>&quot;Outcomes associated with induction of labour&quot;</td>
<td>J Dodd, R Grivell</td>
<td>2009 - 2011</td>
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<tr>
<td>Kylie Gayford</td>
<td>&quot;Cervical ripening before dilatation and curettage for non-viable pregnancy – A Cochrane systematic review&quot;</td>
<td>J Dodd, R Grivell</td>
<td>2009 - 2011</td>
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<tr>
<td>Adele Crowley</td>
<td>&quot;Sealing procedures for preterm prelabour rupture of the membranes – A Cochrane systematic review&quot;</td>
<td>J Dodd, R Grivell</td>
<td>2009 - 2011</td>
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<td>Name</td>
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<tr>
<td>Kate Walsh</td>
<td>“Use of endoanal ultrasound for reducing the risk of complications related to anal sphincter injury after vaginal birth”</td>
<td>2009 - 2011</td>
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<tr>
<td></td>
<td>Supervisors: J Dodd, R Grivell</td>
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<tr>
<td>Sally Reid</td>
<td>“Women’s and Children’s Hospital Clinical Leader for the WISH Project: Implementation of the Antenatal Magnesium Sulphate Guidelines”</td>
<td>2010 - 2011</td>
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<tr>
<td></td>
<td>Supervisors: P Middleton, C Crowther</td>
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<tr>
<td>Rachel Earl</td>
<td>“Customised fetal and infant weight in women who are overweight or obese”</td>
<td>2011</td>
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<td></td>
<td>Supervisor: J Dodd, R Grivell</td>
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<tr>
<td>Joanna Tieu</td>
<td>Cochrane Review Updates</td>
<td>2011</td>
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<td></td>
<td>“Preconceptual care for women with previous gestational diabetes”</td>
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<td></td>
<td>Supervisors: C Crowther, P Middleton</td>
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<tr>
<td>Shanshan Han</td>
<td>Cochrane Reviews</td>
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<td></td>
<td>“Interventions for pregnant women with hyperglycaemia not meeting gestational diabetes and type 2 diabetes diagnostic criteria”</td>
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<td>“Exercise for pregnant women for preventing gestational diabetes mellitus”</td>
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<td></td>
<td>“Different types of dietary advice for women with gestational diabetes mellitus”</td>
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<td>Supervisors: C Crowther, P Middleton</td>
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<tr>
<td>Payam Nikpoor</td>
<td>“Customised birth weight assessment and detection of intrauterine growth restriction”</td>
<td>2011</td>
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<td></td>
<td>Supervisors: C Crowther, R Grivell</td>
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<tr>
<td>Morven Crane</td>
<td>“Diet and exercise advice for the prevention of gestational diabetes”</td>
<td>2011</td>
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<td></td>
<td>Supervisor: C Crowther</td>
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<tr>
<td>Emer Heatley</td>
<td>“Audit on the use of antenatal magnesium sulphate for fetal neuroprotection at the WCH 2009 and 2010”</td>
<td>2011</td>
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<tr>
<td></td>
<td>Supervisors: P Middleton, C Crowther</td>
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<tr>
<td>Honours Students</td>
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<tr>
<td>Emily Bain</td>
<td>“Different magnesium regimens for neuroprotection of the fetus for women at risk of preterm birth”</td>
<td>2011</td>
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<td></td>
<td>Supervisors: C Crowther, P Middleton</td>
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<tr>
<td>Kathleen Wright</td>
<td>“Midwives attitudes towards overweight and obesity during pregnancy”</td>
<td>2011</td>
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<td></td>
<td>Supervisors: J Dodd, D Turnbull</td>
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<tr>
<td>Graduate Student</td>
<td>Thesis Title</td>
<td>Supervisors</td>
<td>Year</td>
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<tr>
<td>Ellen Lytzris</td>
<td>“Psychological issues surrounding weight control in overweight and obese pregnant women”</td>
<td>J Dodd, D Turnbull</td>
<td>2011</td>
</tr>
<tr>
<td>Ellen Lytzris</td>
<td>“Hypnosis antenatal training for childbirth”</td>
<td>J Robinson, C Crowther</td>
<td>2004 - 2011</td>
</tr>
<tr>
<td>Rosalie Grivell</td>
<td>“The effect of obesity and gestational weight gain on fetal growth”</td>
<td>J Dodd, C Crowther</td>
<td>2008 - 2011</td>
</tr>
<tr>
<td>Philippa Middleton</td>
<td>“Contribution of Australian maternal and perinatal trials to health outcomes”</td>
<td>C Crowther, S Green</td>
<td>2008 - 2012</td>
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<tr>
<td>Tulika Bose</td>
<td>“Research synthesis and clinical studies assessing the effects of diet and lifestyle on pregnancy outcomes for women with glucose impairment”</td>
<td>C Crowther, P Middleton</td>
<td>2010 - 2012</td>
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<tr>
<td>Zhixian Sui</td>
<td>“Effect of exercise on limiting weight gain for women who are overweight or obese in pregnancy”</td>
<td>J Dodd, C Crowther</td>
<td>2010 - 2012</td>
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### ARCH Staff and Students *new/returning members in 2011*

<table>
<thead>
<tr>
<th>ARCH Executives</th>
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<tr>
<td>Professor Caroline Crowther [Director]</td>
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<tr>
<td>Professor Jodie Dodd [Co-Director]</td>
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<tr>
<td>Philippa Middleton [Co-Director]</td>
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<tr>
<td>Tanya Bubner [Manager]</td>
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<tr>
<td><strong>Research Group Leaders</strong></td>
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<tr>
<td>Professor Caroline Crowther</td>
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<td>Professor Jodie Dodd</td>
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<td>Professor Alastair MacLennan</td>
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<td>Philippa Middleton</td>
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<td>E/Professor Jeffrey Robinson</td>
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<td>Dr Rosalie Grivell</td>
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<td>Professor William Hague</td>
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<td>Dr Chad Andersen</td>
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<td>A/Professor Ross Haslam</td>
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<td>Dr Andrew McPhee</td>
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<td>A/Professor Dominic Wilkinson</td>
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<td>A/Professor Peter Baghurst</td>
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<tr>
<td>Dr Lisa Moran</td>
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<tr>
<td><strong>Visiting Research Fellows</strong></td>
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<tr>
<td>Dr Alice Rumbold</td>
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<tr>
<td>Dr Carmel Collins</td>
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<tr>
<td>Professor Maria Makrides</td>
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<tr>
<td><strong>Trial Coordinators</strong></td>
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<tr>
<td>Pat Ashwood</td>
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<tr>
<td>Andrea Deussen</td>
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<tr>
<td>Daniela Gagliardi</td>
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<tr>
<td><strong>Data Management</strong></td>
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<td>Vincent Ball</td>
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<td>Sasha Zhang</td>
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<tr>
<td><strong>ARCH Staff and Students</strong></td>
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<tr>
<td>Carol Holst</td>
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<tr>
<td>Kaye Robinson</td>
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<tr>
<td><strong>Statistical Support</strong></td>
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<tr>
<td>*Dr Lisa Yelland</td>
</tr>
<tr>
<td>Kristyn Willson</td>
</tr>
<tr>
<td><strong>Research Fellows</strong></td>
</tr>
<tr>
<td>Dr Emer Heatley</td>
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<tr>
<td>*Dr Thach Son Tran</td>
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<tr>
<td><strong>Research Officers</strong></td>
</tr>
<tr>
<td>Melissa EWens</td>
</tr>
<tr>
<td>Danielle Crosby</td>
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<tr>
<td>Lucy Simmonds</td>
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<tr>
<td><em>Elen Shute</em></td>
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<tr>
<td><em>Claire Binnion</em></td>
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<tr>
<td><strong>Research Scholars</strong></td>
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<tr>
<td>Dr Sally Reid</td>
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<tr>
<td>Dr Debby Utama</td>
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<td>Dr Joanna Tieu</td>
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<td><em>Dr Kate Martin</em></td>
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<td>Dr Kylie Gayford</td>
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<td>Thuy-My Nguyen</td>
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<td>Dr Kristin Hsu</td>
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<td>Dr Courtney Cramp</td>
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**ARCH Publications**

**2011 - Journal Articles**


23. Han S, Crowther CA, Middleton P. Exercise for pregnant women for preventing gestational diabetes...


30. MacLennan AH. Do the results of the Women's Health Initiative studies have relevance for the assessment of the benefits and risks of post menopausal Hormone Therapy? Changes/ Rome Debate IMS-Climacteric 2011;3:5-7 (not ranked).


2011 - Guidelines

2010 - Journal articles


8. Crowther CA, Crosby DD, Henderson-Smart DJ. Phenobarbital prior to preterm birth for preventing neonatal periventricular haemorrhage. Cochrane Database Syst Rev. 2010(1). (IF:5.653; ERA A*).


16. Dodd JM, Crowther CA. Misoprostol for induction of labour to terminate pregnancy in the second or third trimester for women with a fetal anomaly or after intrauterine fetal death. Cochrane Database Syst Rev. 2010(4). (IF:5.653; ERA A*).


20. Gibson CS, MacLennan AH, Haan EA, Priest K, Dekker GA. Fetal MBL2 haplotypes combined with viral exposure are associated with adverse pregnancy


34. Middleton P, Crowther CA, Simmonds L, Muller P. Different intensities of glycaemic control (tight versus very tight) for pregnant women with pre-existing diabetes (Protocol). Cochrane Database Syst Rev. 2010(6). (IF:5.653; ERA A*).

35. Middleton P, Crowther CA, Simmonds L, Muller P. Different intensities of glycaemic control for pregnant women with pre-existing diabetes. Cochrane Database Syst Rev. 2010(9). (IF:5.653; ERA A*).


41. Reid SM, Middleton PF, Cossich MC, Crowther CA. Interventions for clinical and subclinical hypothyroidism in pregnancy. Cochrane Database Syst Rev 2010(7). (IF:5.653; ERA A*).

42. Robinson J. Why getting a healthy start makes all the difference. Aust NZ J Obstet Gynaecol 2010;50(1-1)Suppl1. (IF:0.431; ERA C).


Making a meaningful difference for women and babies


2010 - Books, Chapters & Guidelines


Abstracts of presentations given by ARCH members at PSANZ - 2011

Members of ARCH presented the following key research findings at the Perinatal Society of Australia and New Zealand (PSANZ) in 2011 at the 15th Annual Congress, 10-13 April 2011, Hobart, Tasmania, Australia


Website and Media

The ARCH website contains information on the aims and mission of ARCH and each research division. There is also information for students on various study options available and another area for media releases. The ARCH website can be found at www.adelaide.edu.au/arch.

Media for 2011 include:
- Distinguished international award to Professor Caroline Crowther – SPRH Ebulletin 1 November 2011
- Record $44.8 million health funding for Uni of Adelaide – Adelaide Uni Media Release 17 October 2011
- Research highlights stillbirth factors – Otago Daily Times 16 April 2011
- Stillbirth continues to cause heartbreak for thousands of Australian families – SIDS and Kids 15 April 2011
- Magnesium Sulphate WISH – Breakthrough, Official newsletter for the research foundation of cerebral palsy alliance May 2011
- Professor Alastair MacLennan AO – Australasian Menopause Society 27 January 2011
- Australia Day honour for cerebral palsy researcher – Robinson Foundation 26 January 2011
Grants

New funding to commence 2012

NHMRC Project Grant - $1,978,760. 2012 - 2016
“Does antenatal magnesium sulphate given to women at risk of preterm birth between 30 and 34 weeks’ gestation reduce the risk of death or cerebral palsy in their children? – a randomised controlled trial”
Chief Investigators: C Crowther, P Middleton, D Wilkinson, R Haslam.

NHMRC Centre for Research Excellence Grant - $2,500,000. 2012 - 2016
“Food for future Australians”

NHMRC Project Grant - $639,880. 2012 - 2016
“Copy number variation in Cerebral Palsy”
Chief Investigators: A MacLennan, C Gibson, D Adelson.

Diabetes Australia Research Trust Millennium Grant. $158,385. 2012 - 2014
“Identifying epigenetic pathways from maternal obesity to type 2 diabetes in offspring”
Chief Investigators: J Owens, J Dodd.

Diabetes Australia Research Trust Millennium Grant. $34,318. 2012
“Lifestyle interventions during pregnancy to reduce type 2 diabetes mellitus in overweight and obese women”
Chief Investigators: L Moran, J Dodd.

Women’s and Children’s Hospital Foundation Research Project Grant- $49,913. 2012
“The genetic determinants of cerebral palsy. Gene discovery in familial and isolated cases of cerebral palsy using massively parallel sequencing”
Chief Investigators: G McMichael, J Gecz, E Haan, S Thompson, A MacLennan.

National Health & Medical Research Council (NHMRC) Grants

NHMRC Project Grant - $2,179,916. 2011 - 2015
“SEA-URCHIN: South East Asia – Using research for change in hospital-acquired infection in neonates”
Chief Investigators: S Green, H Jeffrey, S McDonald, M Lahra, M Laopaiboon, J McKenzie, P Lumbiganon, Al: C Crowther.

NHMRC Project Grant - $632,979. 2011 - 2014
“Dietary and lifestyle advice and treatment of women with Borderline Gestational Diabetes: The IDEAL Randomised Controlled Trial.”
Chief Investigators: C Crowther, B Hague, P Middleton, P Baghurst, J Robinson.
NHMRC Project Grant - $447,281. 2011 - 2013
“Prenatal Repeat Corticosteroids in women at risk of preterm birth for improving neonatal health.”
Chief Investigators: C Crowther, L Askie, H Oakey, P Middleton.

NHMRC Project Grant - $832,928. 2011 - 2013
“Immediate delivery vs expectant care in women with preterm prelabour rupture of the membranes close to term – A randomised clinical trial (PPROMT).”
Chief Investigators: J Morris, C Roberts, J Ford, J Bowen, S Buchanan, S Lain, AI: C Crowther.

NHMRC Project Grant - $901,600. 2010 - 2012
“Vaginal progesterone for the prevention of neonatal respiratory distress syndrome-a randomised controlled trial.”
Chief Investigators: C Crowther, J Dodd, A McPhee, V Flenady.

NHMRC Project Grant - $433,750. 2010 - 2012
“Fetal middle cerebral artery Doppler to time second and subsequent transfusions for women with red cell alloimmunisation.”
Chief Investigators: J Dodd, J Dickinson, C Andersen, R Windrim, G Ryan.

NHMRC Project Grant - $268,751. 2010 - 2011
“Magnesium sulphate given to women at risk of preterm birth for neuroprotection of the fetus - an individual patient data review.”
Chief Investigators: C Crowther, L Doyle, P Middleton, H Oakey, L Askie.

NHMRC Project Grant - $1,674,250. 2009 - 2013
“Child health at two years’ corrected age after exposure to dexamethasone or betamethasone: a randomised trial.”
Chief Investigators: C Crowther, J Harding, P Middleton, C Andersen, J Robinson.

NHMRC Project Grant - $1,746,788. 2009 - 2012
“Can better clinical practice lower the rates of sexually transmitted infections in remote Aboriginal communities?”

NHMRC Project Grant - $674,250. 2008 - 2012
“The MiG study: mothers and their offspring at 2 and 5 years: body composition, insulin resistance and development”.

NHMRC Project Grant - $1,466,625. 2008 - 2011
“Limiting weight gain in overweight or obese women during pregnancy to improve health outcomes: a randomised trial.”
Chief Investigators: J Dodd, D Turnbull, A McPhee, G Wittert, J Robinson.
Other Competitive Research Grants

Cerebral Palsy Institute/Foundation, NSW - $600,000. 2011 - 2013.
“Special Initiative and Infrastructure Grant”
Chief Investigator: A MacLennan.

Cerebral Palsy Institute/Foundation, NSW - $274,998. 2011 - 2013.
“WISH Project (Working to Improve Survival and Health for babies born very preterm)”
Chief Investigators: C Crowther, P Middleton, V Flenady, J Morris, S McIntyre.

AusAid, Department for International Development and International Initiative for Impact Evaluation (3ie), $80,000. 2011 - 2012
“Effectiveness and impact of nutrition support programs in reducing maternal mortality and morbidity”
Chief Investigators: C Crowther, P Middleton, T Bubner, V Flenady, Z Bhutta, Z Lassi, T Thach.

Channel 7 Children’s Research Foundation - $50,000. 2011
“Do maternal and infant obesity related genotypes influence efficacy of interventions to limit weight gain in obese pregnant women and obesity in their offspring?”
Chief Investigators: J Robinson, J Dodd, J Owens.

Women’s and Children’s Hospital Foundation Research Project Grant - $50,000. 2011
“Are genomic copy number variations associated with cerebral palsy?”
Chief Investigators: C Gibson, A MacLennan, G McMichael.
Australian Federation of University Women Postdoctoral Grant - $4,795. 2011
Chief Investigator: LJ Moran.

Cerebral Palsy Institute/Foundation, NSW - $146,000. 2010 - 2011.
“A genomic basis for Cerebral Palsy-Studies on a large Australian cohort”
Chief Investigator: A MacLennan.

Department of Health and Ageing - $180,000. 2009 - 2011
“Australian institutions or networks providing support to Cochrane reviewers with respect to methodology, reviewer support or training”.
Chief Investigators: C Crowther, J Dodd, V Flenady, P Middleton.

NIH (USA) - $1,313,377. 2008 - 2012
“Limiting weight gain in overweight pregnant women – effects on mother and child (LIMIT study).”

“The Thrombophilia in Pregnancy Prevention Study (TIPPS): Australian Arm”.
Chief Investigators: M Rodger, W Hague.

Diabetes Australia Research Trust (Category 1)- $39,769.50. 2011
“Lifestyle interventions during pregnancy to reduce type 2 diabetes mellitus in overweight and obese women”
Making a meaningful difference for women and babies

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