Australasian Cerebral Palsy Clinical Trials Network

AusCP-CTN

Centre for Research Excellence

Roslyn Boyd, The University of Queensland

Early Detection & Early Intervention for CP

QLD Paediatric Society, November 2018
Prof Roslyn Boyd  
Prof Iona Novak  
Prof Euan Wallace  
Prof Nadia Badawi  
A/Prof Michael Fahey  
Prof Stephen Rose  
Prof Paul Colditz  
Prof Jenny Ziviani  
Prof Cath Elliott  
Prof Susan Stott  

Dr Lee Barber  
Prof Peter Davies  
Dr Andrea Guzzetta  
Dr Sarah McIntyre  
Dr Leanne Sakzewski  
A/Prof Anthony Smith  
Dr Koa Whittingham  
Prof Rob Ware  
A/Prof Ray Russo  

Dr Joanne George  
Dr Kerstine Pannek  
Dr Hayley Smithers-Sheedy  
Dr Cathy Morgan  
A/Prof Mark Chatfield  
Dr Roz Ward  
Dr Sian Williams
AusCP-CTN

Vision

✓ decline in the rate & reduced severity of CP
✓ improve health outcomes
✓ enable full participation in society.

Mission

✓ Detect cerebral palsy earlier
✓ Fast-track children to new neuro-protectants and early interventions;
✓ Conduct multi-site randomised clinical trials to develop and test new interventions and rehabilitation methods;
✓ Transfer new knowledge to enhance clinical practice;
✓ Develop international clinical practice guidelines guided by a consumer network.
1. Pre-clinical & Neuroprotection
2. Early Detection & Neuroimaging
3. Clinical Trials
4. Knowledge Translation
5. Engagement & Health Policy

- New Knowledge Generation
- Training (Clinical & Research)
- Implementation & Translation
- Health Economics & Telehealth Solutions
We wish to partner with you

PhD Top-Up Scholarships

Recruitment and conduct Clinical Trials

Training in General Movements

Training in Hammer-smith (HINE)

Grant Writing Workshops

Support Your Research Along the Pipeline

auscpnetwork@uq.edu.au
Pre-clinical & Neuroprotection

Professor Nadia Badawi
Iona Novak, Hayley Smithers-Sheedy, Sarah McIntyre
Prevention of prematurity

43% of people with CP were preterm compared with 7.2% live births

Birth defects in CP Research
Gene bank
Gene research hub

Magnesium Sulphate

Antenatal Steroids

CP decreased 30%

Caffeine

Smoke-free legislation
Hypothermia

CP decreased 15%

Kernicterus Prevention

Child Restraints

NEVER, NEVER SHAKE A BABY
Erythropoietin

Improves white matter development in preterm babies
Declining prevalence of pre/perinatally acquired CP

Mcintyre et al, AUSACPDM 2018; Australian Cerebral Palsy Register 2016
Age of Cerebral Palsy Diagnosis

- 0-6MOS: 26%
- 7-12MOS: 27%
- 13-24MOS: 23%
- 25-36MOS: 11%
- >36MOS: 13%

Australian Cerebral Palsy Register (2016)
## Severity of Physical Disability

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<tbody>
<tr>
<td>Walks</td>
<td>50%</td>
<td>66%</td>
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<tr>
<td>Uses wheelchair</td>
<td>50%</td>
<td>34%</td>
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*Reid et al., 2016*
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<tbody>
<tr>
<td>Epilepsy</td>
<td>44%</td>
<td>24%</td>
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<tr>
<td>Intellectual Disability</td>
<td>64%</td>
<td>47%</td>
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Pre-clinical & Neuroprotection

Associate Professor Michael Fahey
Nadia Badawi, Euan Wallace, Paul Colditz
Melatonin Reduces Brain Injury

Melatonin reduces markers of brain injury following hypoxia.

Melatonin could potentially be used to treat newborns with brain injury.

Appears additive to cooling.

James Aridas
Creatine kinase isoforms located in:

- cerebellum,
- choroid plexus,
- hippocampal granular layer
- pyramidal cells

Creatine Deficiency Syndrome:

- delayed onset mental retardation,
- developmental delays,
- lack of motor co-ordination
- epilepsy and autism-like syndromes

Hypotheses

- Following premature birth there will be a period when peripheral and cerebral creatine levels fall.
- This will jeopardize normal brain metabolism and development, predisposing the infant to neurological decline.
- With identification of this creatine deficiency, and a better understanding of creatine accretion by the preterm infant, we can normalize cerebral creatine levels, through infant dietary creatine supplementation.
Early Detection & Neuroimaging

Stephen Rose, Jurgen Fripp, Kerstin Pannek, Ros Boyd, Michael Fahey
Timeline

Only 26% CP diagnosed before 6-months
50% CP is Preterm, 50% term born

Preterm  Term  12weeks CA  Diagnosis Clinical patterns From 12-24 months  Confirmation of CP diagnosis 36-60 months
Early, Accurate Diagnosis and Early Intervention in Cerebral Palsy
Advances in Diagnosis and Treatment

Iona Novak, PhD; Cathy Morgan, PhD; Lars Adde, PhD; James Blackman, PhD; Roslyn N. Boyd, PhD; Janice Brunstrom-Hernandez, MD; Giovanni Cioni, MD; Diane Damiano, PhD; Johanna Darrah, PhD; Ann-Christin Eliasson, PhD; Linda S. de Vries, PhD; Christa Einspieler, PhD; Michael Fahey, PhD; Darcy Fehlings, PhD; Donna M. Ferriero, MD; Linda fetters, PhD; Simona Fiori, PhD; Hans Forssberg, PhD; Andrew M. Gordon, PhD; Susan Greaves, PhD; Andrea Guzzetta, PhD; Mijna Hadders-Algra, PhD; Regina Harbourne, PhD; Angelina Kakooza-Mwesige, PhD; Petra Karlsson, PhD; Lena Krumlinde-Sundholm, PhD; Beatrice Latal, MD; Alison Loughran-Fowlds, PhD; Nathalie Maitre, PhD; Sarah McIntyre, PhD; Garey Noritz, MD; Lindsay Pennington, PhD; Domenico M. Romeo, PhD; Roberta Shepherd, PhD; Alicia J. Spittle, PhD; Marelle Thornton, DipEd; Jane Valentine, MRCP; Karen Walker, PhD; Robert White, MBA; Nadia Badawi, PhD
Hammersmith Trainers

Western Australia:
Jane Valentine
Kate Langdon

South Australia:
Felicity Baker
Kirstie Morgan

Victoria:
Alicia Spittle, Abbey Eeles,
Catherine Hough, Cate Clancy

NSW:
Cathy Morgan
Iona Novak
Cathryn Crowle
Michelle Juarez

NZ:
Anna Mackay
Sian Williams

Queensland:
Jo George, Rachel Thomas, Carly Dickinson,
Kym Morris, Bernadette Shannon
3. PREMO/NEMO toolboxes

Accurate biomarkers
MRI markers of brain injury
From preterm, TEA to childhood
Clinical correlates
Screening for early detection in preterm
and at risk term neonates
Measure effects of neuroprotection
Test early interventions
Prognosis/ prediction of outcome
2. QEDIN: QLD early detection & early intervention network

Clinician Champions of Change
Train the Trainers
From the accredited experts (GMs & HINE)

State-wide ethics for data sharing:
• Clinicians (Paediatricians, Neonatologists, Neurologists, PT, OT, Nursing)
• 2 stage consent
• Screening
• Referral to early intervention
Automated MRI Quantification
Cloud-based quantitative radiological reporting

- Right infants
- Right time
- Right intervention
- Right Intensity
- Reduced costs
- Better outcomes
- Better prediction
- Targeted Surveillance
4. Fast track & test early intervention
REACH RCT [Unimanual v Bimanual]

70-90 hours of Baby CIMT  
*n=* 75

70-90 hours of Bimanual Therapy  
*n=* 75

Roslyn Boyd, Jenny Ziviani, Leanne Sakzewski, Iona Novak, Nadia Badawi, Catherine Elliott, Sue Greaves, Kerstin Pannek, Andrea Guzzetta
Goals Activities Motor Enrichment RCT

GAME
Weekly home visits until 2\textsuperscript{nd} birthday
n=150

Usual Care
n=150

Prof Iona Novak, Dr Cathy Morgan, Prof Nadia Badawi, Prof Ros Boyd, A/Prof Alica Spittle, Prof Russell Dale, Adrienne Kirby, Prof Rod Hunt, Dr Koa Whittingham, Dr Kerstin Pannek
LEAP-CP RCT [Learning through Everyday Activities with Parents]

Early detection of CP + Early Intervention [Parent Delivered] in Low Resource Setting India

n=527 referred, 90% screened, 30% CP, 100/120 recruited

Dr Katherine Benfer, Prof R Boyd, Prof I Novak, Dr C Morgan, Dr K Whittingham

Waitlist Control
VISIBLE RCT [Central Visual Impairment]

Fortnightly home visit from < 6-12 months of active goal directed training with salience & consistency of the environment

CIA: A/Prof Andrea Guzzetta, Prof Roslyn N Boyd, Prof Iona Novak, Dr Cathy Morgan, Dr Alison Salt, Prof Catherine Elliott, Dr Kerstin Panneck, Dr Jurgen Fripp.
Early PACT RCT

Parenting Acceptance & Commitment Therapy in newly diagnosed families n=60, using online training

Waitlist Control

Dr Koa Whittingham, Prof Ros Boyd, Dr Jeannie Sheffield
Participate RCT

Physiotherapy & Motivational Interviewing to increase participation in motivating physical activities of choice

Dr Leanne Sakzewski, Prof Roslyn N Boyd, Prof Iona Novak, Prof Catherine Elliott, Dr Cathy Morgan, Prof Annette Manjnemere, Dr David Rowell, Prof Robert Ware
Hand Arm Bimanual Intensive Training Including Lower Extremity training HABIT-ILE RCT

65 hours of HABIT-ILE will be achieved through a 2 week intensive camp
GMFCS II-IV

Waitlist Control

Dr Leanne Sakzewski, Prof Roslyn N Boyd, Prof, Yannick Bleyenheuft, Prof Iona Novak, Prof Catherine Elliott, Dr Cathy Morgan, Dr Kerstin Panneck, Dr David Rowell, Prof Robert Ware

Australian Government National Health and Medical Research Council
Knowledge Translation
Professor Iona Novak
Dr Leanne Sakzewski
Australasian CP Clinical Care Network

QLD: UQ QLD CP Research (QCPRRC), Perinatal Research Centre, CSIRO

NSW: Uni of Sydney, Cerebral Palsy Institute, Westmead Childrens Hospital.

VIC: Ritchie Centre, Monash Uni, Monash Medical Centre

WA: Princess Margaret Hosp. Curtin Uni, Telethon Kids

SA: Adelaide Children’s Hospital, SA Rehab service

NZ: University of Auckland Starship Children’s Hospital

Policy: NDIS, Better Start

Practice: 5 State-wide CP Rehabilitation services

Consumer Council & Network

Research: AACPDM, AusAACPDM, IAACP

Education: Universities, CP Training, RACP, FRARM

IMPACT: International Multidisciplinary Prevention & Cure Team Network

National and International Translation Networks

Australasian Cerebral Palsy Clinical Trials Network
Basic Science Discovery → Proposed Human Use → Proven Clinical Use → Clinical Practice → Public Health Impact
Engagement & Public Policy
Professor Jenny Ziviani
Professor Catherine Elliott
Dr Leanne Sakzewski
Dr Sarah McIntyre
Consumer and clinician training

Anne McKenzie, AM, Telethon Kids Institute

5. Knowing what to research next
4. Letting people know the results
3. Doing it
2. Deciding how to do it
1. Deciding what to research

THE RESEARCH CYCLE

Involving People In Research

Australasian Cerebral Palsy Clinical Trials Network
AusCP-CTN

Centre for Research Excellence
## Upcoming Events

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<tr>
<th>SYDNEY November 2018</th>
<th>MELBOURNE November 2018</th>
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<tr>
<td>Monday</td>
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<tr>
<td>General Movements</td>
<td>General Movements</td>
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<tr>
<td>Training</td>
<td>Training</td>
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<td>Tuesday</td>
<td>Thursday</td>
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<tr>
<td>HINE Training</td>
<td>Grant</td>
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<td>Wednesday</td>
<td>Friday</td>
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<td>Hot Topics Update</td>
<td>Writing</td>
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<td>Thursday</td>
<td>Saturday</td>
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<tr>
<td>Prof Steve Miller</td>
<td>Workshop</td>
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<tr>
<td>Sick Kids</td>
<td>Sunday</td>
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**PERTH July 2018**

- Grant Writing Workshop
# Hot Topics in Cerebral Palsy

**Monday 5 November 2018**  
Cerebral Palsy Alliance, Allambie Heights, NSW

## Morning Session

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<tr>
<th>Time</th>
<th>Topic</th>
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<td>0900-0905</td>
<td>Introduction, Prof. Nadia Badawi</td>
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<td>0905-0910</td>
<td>Vision of the CRE, Prof. Ros Boyd</td>
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<td>0910-0920</td>
<td>Engagement and Health Policy: Chair - Theme Leader, Prof. Catherine Elliott</td>
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<tr>
<td>0920-0930</td>
<td>Importance of engagement in research and the CRE, Prof. Catherine Elliott</td>
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<td>0930-1030</td>
<td>Parent view on early detection, Hiam Sakakini</td>
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<td>1030-1045</td>
<td>Early Detection and Neuroimaging: Chair - Theme Leader, Prof. Stephen Rose</td>
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<td>1045-1100</td>
<td>Prediction of CP: CUS vs MRI and when to use what, Prof. Rod Hunt</td>
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<td>1100-1120</td>
<td>MORNING TEA</td>
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<td>1120-1135</td>
<td>Automated reading of early MRIs, Dr Kerstin Pannek</td>
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<td>1135-1150</td>
<td>Automated reading of MRI’s for Cerebral Palsy, Dr Alex Pagonzzi</td>
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<td>1150-1220</td>
<td>Clinical Trials: Chair – Theme Leader, Prof. Ros Boyd</td>
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<td>1220-1230</td>
<td>Parenting Interventions PACT, Dr Koa Whittingham</td>
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<td>1230-1240</td>
<td>AMNION: Stem cell clinical trial, Prof. Iona Novak and Prof. Rod Hunt</td>
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<td>1240-1250</td>
<td>Q and A time with Theme Presenters</td>
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<td>1250-1340</td>
<td>LUNCH</td>
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**More Information:**  
**SPEAKERS**

<table>
<thead>
<tr>
<th>Speaker</th>
<th>Institution</th>
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<tbody>
<tr>
<td>Prof. Richard Lieber</td>
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<td>A/Prof. Glenn Lichtwark</td>
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<td>Prof. Ros Boyd</td>
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<td>Dr Steven Obst</td>
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<td>Prof. David Lloyd</td>
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<td>Prof. Andy Cresswell</td>
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<td>Prof. Ngaire Susan Stott</td>
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<td>Dr Lee Barber</td>
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<td>A/Prof. Jane Valentine</td>
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<td>Dr Christopher Carty</td>
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**PROGRAM**

**Australasian Cerebral Palsy Clinical Trials Network**

**Centre for Research Excellence**

**CHRC (Muscle in CP)**

**30 October 2018**

**9:00am-5:00pm**

Centre for Children's Health Research
62 Graham St, South Brisbane QLD 4101

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**Time** | **Topic**
---|---
9:00-10:00 | International Keynote Speaker: Chair, Professor Ros Boyd
10:00-10:15 | Musculoskeletal adaptations to CP: Implications for therapy, Prof. Richard Lieber, Northwestern University, Chicago
10:15-10:45 | MORNING TEA
10:45-11:15 | Q & A time with international keynote

**Invited National Speakers: Chair, Professor Rick Lieber**

11:15-11:45 | Assistive Wearable Devices for Rehabilitation for Children with Disability, Prof. David Lloyd, Griffith University
11:45-12:15 | MRI of muscle in healthy children & children with CP, Prof. Ngaire Susan Stott, The University of Auckland
12:15-12:30 | Impact of Botulinum toxin A on muscle in children with CP, A/Prof. Jane Valentine, The University of WA
12:30-13:30 | Q & A time with national speakers

**LUNCH AND STUDENT POSTERS**

**13:30-14:30** | Clinically relevant skeletal muscle anatomy and physiology, Prof. Richard Lieber, Northwestern University, Chicago

**Invited CRE Speakers: Chair, Professor Sue Stott**

14:30-15:00 | Muscle Growth and Quality in Individuals with CP, Dr Lee Barber and Dr Steven Obst, Central Queensland University
15:00-15:30 | Muscle mechanics during walking in CP, A/Prof. Glen Lichtwark, The University of Queensland
15:30-16:00 | AFTERNOON TEA

**Invited CRE Speakers: Chair, Associate Professor Jane Valentine**

16:00-16:30 | Use and Mis-use of EMG, Prof. Andy Cresswell, The University of Queensland
16:30-17:00 | Personalised neuromusculoskeletal modelling for CP gait, Dr Christopher Carty, Griffith University
17:00-17:20 | Q & A time with Theme Presenters
17:20-17:30 | Closing remarks, Prof. Ros Boyd

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**AusCP-CTN CRE Partners:**

W: www.cre-auscpctn.centre.uq.edu.au E: auscpnetwork@uq.edu.au

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**Australian Government**

**National Health and Medical Research Council**

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**The University of Queensland**

**The University of Sydney**

**Curtin University**

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**Griffith University**

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**CSIRO**

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**Monash University**

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**University of New South Wales**

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In 5-years time

- Given rise to novel neuroprotective studies
- Fostered the career development of researchers to build capacity
- Accelerated translation from clinical trial to clinical practice to improve health outcomes
- Engaged with consumers & researchers across 5 states
QEDIN-CP
Queensland Early Detection & Early Intervention Network

Project lead: Prof Roslyn Boyd
Clinical Co-ordinator: Dr Joanne George
Ethics & Governance Co-ordinator: Dr Tracey Evans

www.qcprrc.uq.au/qedin-cp
qedincp@uq.edu.au
Find out more at AusCP-CTN

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auscpnetwork@uq.edu.au;

W: www.cre-auscpctn.centre.uq.edu.au

SIGN UP TODAY for regular research briefings, education, training and involvement in research and implementation.

We want to collaborate!!