Message from the Co-Directors

The Centre of Excellence in Severe Asthma is working hard to bring severe asthma to the forefront of clinical research in Australia and indeed internationally, and to translate new knowledge into practice to improve outcomes for people with severe asthma.

Over the last two years the investigators and scholars of the centre have made significant progress in defining the research agenda, developing and conducting new research, and in developing educational material to aid in the translation of knowledge into clinical practice. We have also effectively developed new research collaborations with clinicians and researchers from the international severe asthma community. This report describes some of these activities.

Over the next 12 months, we look forward to advancing this new research and engaging with the wider community to further develop tools and resources to improve the management of severe asthma. We will also work with key peak bodies to translate new research and develop contemporary public health messages as they relate to severe asthma.

We hope to continue to develop as a sustainable translational research and training centre for this important health care area.
About the Centre of Excellence in Severe Asthma

The Centre of Excellence in Severe Asthma supports training, research, collaboration and translation of findings for the management of severe asthma. It is funded by the Australian National Health and Medical Research Council (NHMRC) Centres of Research Excellence programme from 2014-2019. The centre brings together researchers from universities and hospitals in Australia and internationally. Our Chief Investigators are located in Newcastle, Sydney, Melbourne, Brisbane and Perth. Leading researchers, clinicians and healthcare providers are teaming up with stakeholders, people with asthma and their significant others to improve the diagnosis, management and treatment of severe asthma.

Why Study Severe Asthma?

Asthma is a common disease, which directly affects 10% of Australians. Most people with asthma are able to achieve control of their disease. People with severe asthma however, have persistent symptoms that remain uncontrolled with standard treatment. This reasonably small population contributes to the major burden of illness from asthma.

Severe asthma negatively impacts health and quality of life for people with the disease and their families, and it represents a major healthcare cost for society. New approaches to the management of severe asthma are urgently needed in order to improve outcomes for patients and the health care system.

Our Mission

The mission of the Centre is to develop innovative solutions for severe asthma. We are developing innovative approaches to understand why severe asthma occurs, to improve disease diagnosis and management and to inform the use of new therapies.

The specific objectives of the centre are to:

- Generate new knowledge on the prevalence and burden of severe asthma in Australia
- Design and validate tools and programmes to more effectively manage severe asthma in the clinic
- Test new management strategies that combine multidisciplinary team management with personalised diagnostic testing
- Inform uptake and access of new targeted therapies for severe asthma
- Translate these initiatives into practice through policy development and collaboration
People

Chief Investigators:

Prof. Peter Gibson
University of Newcastle
Hunter Medical Research Institute
John Hunter Hospital

Prof. Vanessa McDonald
University of Newcastle
Hunter Medical Research Institute
John Hunter Hospital

A/Prof. Greg King
University of Sydney
Woolcock Institute of Medical Research
Royal North Shore Hospital

Clin. Prof. Helen Reddel
University of Sydney
Woolcock Institute of Medical Research

A/Prof. Lorraine Smith
University of Sydney

Prof. Guy Marks
University of New South Wales
Woolcock Institute of Medical Research
Liverpool Hospital
South Western Sydney Clinical School

Prof. Peter Wark
University of Newcastle
Hunter Medical Research Institute
John Hunter Hospital

Prof. Bruce Thompson
Monash University
Alfred Hospital

Prof. John Upham
University of Queensland
Princess Alexandra Hospital

Clin. Prof. Alan James
University of Western Australia
Sir Charles Gairdner Hospital
Hollywood Private Hospital

Associate Investigators:

Prof. Ian Yang
A/Prof. Sinthia Bosnic-Anticevich
A/Prof. Kerry Inder
Prof. Frank Thien

Prof. Paul Reynolds
Prof. Christopher Doran
A/Prof. Celeste Porsbjerg

Prof. Nicholas Zwar
Prof. Sandra Hodge
Dr. Anne Vertigan

Post Doctoral Researchers:

Dr. Michael Fricker (University of Newcastle)
Dr. Vanessa Clark (University of Newcastle)
Dr. Tong Gong (University of Sydney)

Daniela Eassey (University of Sydney)
Jeeva Sanjeevan (Monash University)
Bilal Malik (University of Newcastle)
Sai Praneeth Narla (University of Queensland)
Natalie Niessen (University of Newcastle)
Getachew Mulu (University of Newcastle)

Affiliated Researchers:

Laura Cordova Rivera (University of Newcastle)
Katrina Tonga (Woolcock Institute)
Catherine Farrow (Woolcock Institute)

Dr. Steven Maltby
Mrs. Deborah Hall

BUILDING COLLABORATION:
The development of new knowledge, patient management strategies and effective implementation requires effective teamwork and collaboration. Our Centre’s investigators have a long track record of collaborative research, integrating research findings and developing strategies for future research.
Highlights

Training the next generation

The Centre of Excellence has recruited PhD scholars and post-doctoral fellows, as well as affiliated trainees. Further PhD students and post-doctoral fellows will be joining the Centre.

We have implemented an innovative and engaging training programme, with the goal of building the next generation of severe asthma clinical researchers. Our scholars are supported in developing new research ideas and have access to seed funding to help generate pilot data and to further develop their research careers. Scholars are actively involved with the severe asthma research community, this is facilitated within our Annual Scientific Meeting, through educational activities and within the mentor programme. To support our scholars’ research training and career development, we have developed a number of programmes, including career development sessions and a monthly severe asthma journal club. Further, we launched a trainee-mentoring programme in October 2016, where trainees are connected with a chief investigator and encouraged to discuss their research progress, career development and future directions.

Meet Some of Our Researchers!

<table>
<thead>
<tr>
<th>Michael Fricker</th>
<th>Vanessa Clark</th>
<th>Daniela Eassey</th>
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<td>will be characterising existing and identifying new biomarkers to inform severe asthma diagnosis and treatment strategies. During his PhD studies he trained as a cell biologist with expertise in cell signaling at the University of Cambridge. In subsequent post-doctoral roles he investigated the contribution of defective cell signaling to neurodegenerative disease (University of Cambridge) and lung disease (HMRI, University of Newcastle). He is a member of TSANZ, Lung Foundation Australia and the European Respiratory Society.</td>
<td>is a behavioural researcher with an undergraduate degree in Psychology and PhD in Psychiatry. Vanessa has an interest in mental health and physical health research, in particular the interaction between mental health and chronic disease. In collaboration with other members of the CRE, Vanessa will pilot test a brief intervention targeting anxiety, depression and physical inactivity among at-risk patients with severe asthma. Outside of research she loves shopping, wine and cheese and is a part-time farmer.</td>
<td>completed her Bachelor of Pharmacy (Hons class 1) from the University of Sydney. She is a registered pharmacist and is currently working in a community pharmacy. Daniela’s research focuses on looking at people’s experiences of living with severe asthma. She is at the stage of recruiting participants and will be starting the interviews shortly. Recently, she attended a conference in Tenerife, where she presented her systematic review and won best video presentation. You can view it here.</td>
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Research & Translation

A primary focus of the Centre of Excellence is to generate new knowledge through research and translate new findings into clinical practice. Research outcomes inform translation and training activities, which in turn improve disease management.

**THME 1: Monitoring the Burden of Severe Asthma in Australia**

To better understand the impact of severe asthma, we are using disease registers to determine disease prevalence and impact, performing data linkage analysis to assess patient outcomes and using qualitative methods to better understand the experience of patients with severe asthma and improve management approaches.

**Research Programs Underway:**

- **Developing National Indicators for Severe Asthma**
- **Phenotypic Heterogeneity and Illness Burden in Severe Asthma**
- **Concordance and Goal Setting in Severe Asthma Care**
- **Managing New Therapies in Severe Asthma**

**Outputs:**

- **Australian Xolair Registry (AXR):** A series of published analyses provide real-world insight into the use of Xolair / Omalizumab (anti-IgE) in the clinic, by identifying patient populations likely to respond to treatment. In a series of publications, we have reported data supporting the effectiveness and response predictors for omalizumab in the Australian population ([link](#)), as well as the effectiveness of omalizumab above the recommended dosing range ([link](#)) and the response of individuals with overlapping severe allergic asthma and chronic obstructive pulmonary disease to omalizumab therapy ([link](#)).
- **Severe Asthma – Uncovering the Reality:** Data generated in this qualitative study of the lived experience of Australians with severe asthma were presented in a series of symposia across Australia in 2016. Conducted by Juliet Foster, Helen Reddel, Michael Guo and Vanessa McDonald in partnership with Asthma Australia.

**THEME 2: Initiatives To Aid Management Of Severe Asthma**

Severe asthma requires a different management approach to that of mild or moderate asthma. Phenotyping provides personalised information in individual patients and allows for rational treatment approaches using new targeted therapies. We are assessing the utility of new diagnostic tests and techniques to better inform patient phenotyping and management.
Research Programs Underway:

- Multidimensional Management of Severe Asthma
- Accessible Severe Asthma Biomarkers
- Developing a Severe Asthma Treatment Algorithm
- Exacerbation Risk in Severe Asthma
- Small Airway Physiology in Severe Asthma

TRANSLATION

Our translation activities have focused on implementing new knowledge into practice. These activities include involvement in the development of clinical practice guidelines and knowledge transfer tools and engagement with clinicians and key stakeholders to inform our research and practice agenda.

Examples of translation activities:

- **Roundtable Meeting**: Australian experts were convened to discuss models of care and integration of new, targeted therapies for the management of severe asthma.

- **Severe Asthma Expert Forum**: Clinical experts in severe asthma discussed new treatment and management approaches for severe asthma, focussed on how they treat patients and what evidence is required to inform management.

- **How to Treat (Australian Doctor)**: The How-to-Treat Series provides practical insights to a clinician audience, to inform practice with evidence-based approaches and updates on treatment options.
  - **Publication**: How to Treat Severe Asthma Part 1 – Diagnosis & Part 2 – Management (2016) Maltby S, Gibson PG, Mattes J, McDonald VM.

- **Seeking Innovative Solutions in Severe Asthma**: A review series edited by CRE investigators in Respirology, featuring reviews of aspects relevant to severe asthma.
  - **Publications**:
    - Severe Asthma: Can We Fix It? (2017) McDonald VM, Maltby, S., Gibson, PG. Respirology

- **Expert Reviews**: Provide up-to-date insight into best practices for patient treatment and management in the severe asthma clinic.
  - **Example Publications**:
    - Diagnosis and Investigation in the Severe Asthma Clinic (2016) Wark PAB, Hew M, Maltby S, McDonald VM, Gibson PG. Expert Reviews in Respiratory Medicine

- **International Guideline Development**
- **Resources**: Available on our [website](#).  
  - **Mepolizumab / Omalizumab Clinical Recommendations**: An overview of each monoclonal treatment. These documents can be integrated with local requirements, to inform implementation.
  - **Severe Asthma Assessment Checklist**: Provides a practical structure to inform the diagnosis and characterisation of severe asthma in the clinic.
Online Content:

We officially launched our website at the Thoracic Society of Australia and New Zealand (TSANZ) Annual Scientific Meeting in Perth, on 05 April 2016.

www.severeasthma.org.au

The website provides useful resources relating to severe asthma, for a range of audiences. If you are interested in hearing more about our activities, please sign up for our newsletter, at the bottom of our homepage.

Topics Include:

- News
- Events
- Recorded Seminars
- Toolkits
- Educational Materials
- Publications

Additional content is currently under development for:

- Individuals With Severe Asthma And Their Families: Informative summaries about severe asthma, available treatment options and tests and useful links.

Website Metrics (to 05 January 2017)

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You can also follow us on Twitter @SevereAsthmaCRE

Toolkits and Resources

We are working toward developing a clinician toolkit, algorithms and checklists to help with severe asthma diagnosis, management and treatments, which will be made available on our website (www.severeasthma.org.au/tools-resources/toolkits/)

Current Resources Available Include:

- Clinical Recommendations For The Use Of Omalizumab In Severe Asthma
- Clinical Recommendations For The Use Of Mepolizumab In Severe Asthma
- Severe Asthma Assessment Checklist
- Newcastle Laryngeal Hypersensitivity Questionnaire
Webinar Presentations

The Centre regularly hosts national and international experts for seminars on topics related to severe asthma. Whenever possible, these seminars are recorded and made available on our website (www.severeasthma.org.au/tools-resources/past-webinars/).

Highlighted Recorded Webinars Available:

**Stratified Medicine in Severe Asthma**  
**Prof. Liam Heaney.** This presentation focuses on clinical assessment in difficult-to-treat asthma and mechanisms involved in severe disease, including the identification and management of poor adherence to therapy and development of novel biomarkers and translational therapeutics in severe disease.

**Biomarkers of Inhaled Corticosteroid Response in COPD**  
**Prof. Ian Pavord.** This presentation focuses on the use of biomarkers to inform disease management decisions in respiratory disease. Specifically, it provides insight on biomarkers of inhaled corticosteroid in chronic obstructive pulmonary disease (COPD), to identify patient groups that are most likely to respond to steroid therapies.

**Occupational Asthma**  
**Dr. Krystelle Godbout.** Occupational asthma is asthma that is caused or worsened by exposure in the workplace environment. This session focussed on the evaluation of occupational asthma and the utility of various diagnostic modalities for the diagnosis of sensitiser-induced occupational asthma.

**Living With Severe Asthma**  
**Prof. Helen Reddel & A/Prof. Lorraine Smith.** This presentation provides insights into individuals’ experience of living with severe refractory asthma and how it impacts on their lives. The study was supported by Asthma Australia.

**Thunderstorm Asthma**  
**Prof. Guy Marks.** This webinar was in response to the thunderstorm that hit Melbourne during the afternoon of 21st November 2016, which lead to an acute spike in asthma symptoms for many people. This tragically resulted in the loss of eight lives. On behalf of the Centre of Excellence in Severe Asthma we offer our sincere condolences to the families who lost loved ones. In this seminar, Guy Marks provides insight into what causes thunderstorm asthma and treatment and management strategies to improve patient outcomes.

**Monoclonal Antibody Therapy and Severe Asthma**  
**Prof. Peter Wark.** Monoclonal antibodies have emerged as new therapeutic options for the treatment of severe, treatment-refractory asthma. This presentation focusses on currently approved therapies and treatments in development. It also provides insights into the use of these therapies in the clinic.

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**Webinar Metrics (to 05 January 2017)**

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Highlighted Events

Events and seminars are regularly hosted and form an integral part of our training programme and promote collaboration. We post regular updates about upcoming events, including face-to-face meetings and seminars, and live webinars on our website (www.severeasthma.org.au).

**Official Launch Event (21st October 2015, HMRI, Newcastle)**

Our official launch featured presentations by A/Prof. Geraint Rogers, Prof. Vanessa McDonald and Prof. Guy Marks. A/Prof. Lorraine Smith also facilitated an excellent discussion with four consumers who live with severe asthma, highlighting the impact of disease on their lives and promising results from new treatments.

**Roundtable Meetings (3rd December 2015, Woolcock Institute)**

A roundtable meetings of Australian experts from academia, primary & tertiary healthcare, health policy and biopharma was convened. Areas of discussion were 1) models of care and 2) integration of new targeted therapies for the management of patients with severe asthma.

A summary of these discussions was recently published in *Respirology*.

**Special Interest Group at TSANZ (5th April 2016, Perth)**

We hosted a symposium at the 2016 TSANZ Annual Scientific Meeting titled “Towards Innovative Solutions for Severe Asthma”, which featured A/Prof. Mark Hew, Clinical A/Prof. Richard Loh, Prof. Jo Douglass and international expert Professor Liam Heaney.

**Annual Research Meeting (19th October 2016, Newcastle)**

Our annual research meeting was held at the HMRI in Newcastle. It included presentations by our funded trainees, a career development workshop on “Getting Published” led by Prof. Peter Gibson and a webinar by Prof. Helen Reddel on the “Living With Severe Asthma Study”. A recording of these seminar is available on our website.

**Dr. Robert Niven (University of Manchester) – March 2017**

Dr. Niven leads one of 4 centres developing the Severe Asthma National Database Programme in the UK. The CRE hosted his international visit, which included presentations in Sydney, Newcastle, Brisbane, Melbourne and Perth. An online webinar recording is available on our website.

**TSANZ Annual Conference 2017 (25th March 2017, Canberra)**

We will host a symposium at the 2017 TSANZ Annual Scientific Meeting titled “Pathophysiology of Severe Asthma”, featuring presentations on biopsy, lung histology, animal models and cryobiopsy techniques, in severe asthma.

We are also excited to host a post-graduate workshop at the 2017 TSANZ conference. The workshop entitled “Severe Asthma: A Clinical Focus” will provide practical insights into the assessment of severe asthma, targeted therapies, disease registries and case studies.
Funded Projects

As part of our research programme, the Centre of Excellence funds small research seed grants on topics relevant to severe asthma. The goal of this scheme is to provide pilot funding that will serve as the basis of future grant applications and to facilitate translation and implementation of existing findings.

**Round 1 (commenced mid-2015)**

- **Sinthia Bosnic-Anticevich**: Severe asthma: identifying patterns of medication taking behavior in primary care
- **Phan Nguyen**: The Mechanism of Action of Bronchial Thermoplasty in Asthma
- **Lorraine Smith / Helen Reddel**: A systematic review and qualitative analysis of patient experiences of severe asthma.
- **Peter Wark**: Inflammation based management of severe asthma: utility of blood eosinophils
- **Peter Wark**: How oxidative stress makes severe asthmatics susceptible to infection with Rhinovirus

**Round 2 (commenced January 2016)**

- **Katherine Baines**: A sputum gene expression signature of 6 biomarkers can predict azithromycin treatment responsiveness and future frequent exacerbations in severe asthma
- **Claude Farah**: Understanding the effects of bronchial thermoplasty in severe asthma: a pilot study
- **Alan James**: Heterogeneity of airway remodelling in severe asthma
- **Vanessa McDonald**: Development and validation of the first patient-reported outcome measure (PROM) for severe asthma patients
- **John Upham**: Aberrant immune responses to viruses in severe asthma: what role does IL-33 play?
- **Jodie Simpson**: The impact of azithromycin therapy on the airway microbiome in severe asthma
- **Cindy Thamrin**: Home monitoring of lung function using forced oscillations in severe asthma: a prospective, proof-of-concept study
Publications

Research published by Centre of Excellence in Severe Asthma investigators is highlighted below, focused on publications that are directly relevant to severe asthma. Chief Investigators are indicated in **bold**, staff and associate investigators are underlined.

**2016**

18. Loymans RJF, Honkkoop PJ, Termeer EH, Snoeck-Stroband JB, Assendelft WJJ, Schermer TRJ,
Centre of Excellence in Severe Asthma


2015:


Contact Information

Would you like to get involved with the Centre of Excellence in Severe Asthma? We would be happy to speak with you. The best way to contact us is via email: please include a brief description of your enquiry and we will get back to you ASAP.

Email enquiries: severeasthma@newcastle.edu.au

Our website (http://www.severeasthma.org.au) is the best source of information on the Centre of Excellence in Severe Asthma and is regularly updated with news and upcoming events. If you would like to receive updates on events, useful resources and research please join our mailing list, at the bottom of our homepage, and follow us on Twitter @SevereAsthmaCRE.

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