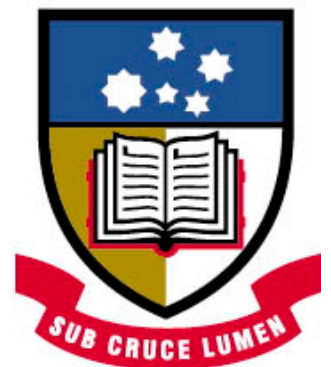


# Frontal Sinus Surgery: Indications and Outcomes in Chronic Rhinosinusitis



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Submitted for the title of Doctor of Philosophy

March 2014

This thesis is dedicated to my incredible family who have sacrificed so much, and supported me without reservation.

Karuna, Sachin and Vivek

# Financial Support

No outside financial support has been received for this PhD

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# Thesis declaration

This work contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution to Yuresh Naidoo and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text.

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Dr Yuresh Naidoo

# Acknowledgements

I would like to formally acknowledge the many people who have made this PhD possible.

Firstly, to Professor PJ Wormald, who has been a most incredible and generous mentor. He is an inspiration and without his support and encouragement to engage in this project, I would never have even thought it possible. I hope that I can live up to his expectations not only as a past fellow and clinician, but also as an academic surgeon.

To my co-researchers and friends Dr Ahmed Bassiouni, Dr Mark Keen, Dr Neil Tan, Dr David Wen, and Dr Deetpi Singhal- it was an honour working with you all. Ahmed deserves a special mention. He is without doubt, one of the smartest and hardest working individuals I have ever met. His enthusiasm for anything and everything is infectious.

Dr Sam Boase, Dr Andrew Foreman and Dr Rowan Valentine have helped me immensely in the nitty-gritty of research and preparation of papers and presentations. They have made my life as a researcher as painless as possible. I also acknowledge the contribution of all members of the Queen Elizabeth Hospital ENT department, in particular Ms Lyn Martin, who has been the bedrock of the department and solved most, if not all, of my many administrative problems. Closer to home, a huge thank you to my other family at the ENT Centre: Ray Sacks, Niell Boustred and Bill Johnston who have

been so encouraging and supportive; and Di Russell for helping with editing and proof reading.

To my brother-in-law, Krishan, thank you for being there whenever I needed a bit advice and encouragement. My parents, Anand and Molly, and my sister Sayuri, have had an unwavering belief in my ability and that belief has driven me to achieve all that I have. Thank you.

To my boys Sachin and Vivek, your sacrifices in not having as much of me as you both deserve is genuinely acknowledged. You boys have been incredibly generous in allowing me to put my PhD ahead of your needs on so many occasions. I promise now that I have more time on my hands, we will spend much more time together.

Finally and on a personal note, a huge thank you to my wonderfully supportive and loving wife, Karuna. Without her unconditional love and support this PhD would have been impossible. Karuna has been most understanding of the pressures of my work and research. She has been a brilliant mother and father to our boys. She shared the pain that comes with 3 years of research and long hours, and deserves the plaudits for its completion.

Thank you.

# **Publications arising from this thesis**

## **Chronic rhinosinusitis assessment using the Adelaide Disease Severity Score**

Naidoo, Y., Tan, N., Singhal, D., Wormald, P. J.  
*Journal of Laryngology and Otology* 2013 Jul;12 Suppl 2:S24-8.

## **Long-term results after primary frontal sinus surgery**

Naidoo, Y., Wen, D., Bassiouni, A., Keen, M., Wormald, P. J.  
*International Forum of Allergy & Rhinology*, 2012 May-Jun; 2(3): 185-90

## **Risk factors and outcomes for primary, revision, and modified Lothrop (Draf III) frontal sinus surgery.**

Naidoo, Y., Wen, D., Bassiouni, A., Keen, M., Wormald, P. J.  
*International Forum of Allergy & Rhinology*, 2013 May; 3(5): 412-7

## **Long-term outcomes for the endoscopic modified lothrop/draf III procedure: A 10-year review**

Naidoo, Y., Wen, D., Bassiouni, A., Keen, M., Wormald, P. J.  
*Laryngoscope*, 2014 Jan; 124(1): 43-9.

# **Presentations arising from this thesis**

## **Long-term outcomes after frontal sinus surgery**

American Rhinological Society Annual Meeting

San Francisco, USA, September 2011

## **Risk factors and outcomes for primary, revision, and modified Lothrop (Draf III) frontal sinus surgery**

American Rhinological Society Annual Meeting

Washington, USA, September 2012

## **Frontal Sinus Surgery – Philosophy, Decision Making, Tips and Pitfalls**

The Australian Society of Otolaryngology Head & Neck Surgery Scientific Meeting (SA), Adelaide, November 2012.

## **Philosophy, Decision Making and Outcomes of Frontal Sinus Surgery**

14th Advanced Functional Endoscopic Sinus Surgery Course

Adelaide, November 2011

**Philosophy, Decision Making and Outcomes of Frontal Sinus  
Surgery**

Australasian Rhinological Society Meeting

Coolum, Queensland, Australia, October 2012

.

# Abbreviations

ADSS	Adelaide Disease Severity Score
AFS	Allergic fungal sinusitis
AFRS	Allergic fungal rhinosinusitis
AR	Allergic rhinosinusitis
ARS	Acute rhinosinusitis
A-P	Anterior-Posterior
CL	Caldwell-Luc
CRS	Chronic rhinosinusitis
CRSsNP	Chronic rhinosinusitis without nasal polyps
CRSwNP	Chronic rhinosinusitis with nasal polyps
CFT	Canine Fossa Trephination
CT	Computed Tomography
rCRS	Refractory CRS
EM	Eosinophilic mucus
ESS	Endoscopic sinus surgery
EM-CRS	Eosinophilic Mucus Chronic Rhinosinusitis
ECRS	Eosinophilic Mucus Chronic Rhinosinusitis
EMLP	Endoscopic Modified Lothrop Procedure
FDO	Frontal Drillout
FESS	Functional Endoscopic Sinus Surgery
IgE	Immunoglobulin E

INCS	Intranasal Corticosteroids
L-M	Lund-Mackay
MMA	Middle Meatal Antrostomy
MRI	Magnetic resonance imaging
NAFES	Non Allergic Fungal Eosinophilic Sinusitis
NANFES	Non Allergic Non Fungal Eosinophilic Sinusitis
NSAID	Non-steroidal Anti-inflammatory Drug
OMU	Osteomeatal Unit
OR	Odds Ratio
<i>P. aeruginosa</i>	<i>Pseudomonas aeruginosa</i>
PROM	Patient Reported Outcome Measure
QoL	Quality of Life
<i>S. aureus</i>	<i>Staphylococcus aureus</i>
SNOT-20	Sino-nasal Outcome Test 20
VAS	Visual Analogue Scale



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## Thesis summary

The research described in this PhD thesis follows an extensive literature review of the role of the medical and surgical management of CRS. Despite the utilization of surgery to alleviate the symptoms of CRS refractory to medical therapy, there are clear deficiencies in our understanding of what type of surgery to perform, and how extensive this surgery should be so as to maximize long-term symptom alleviation and control. Particular controversy exists regarding addressing the frontal sinus with a wide variety of philosophies employed, but with limited scientific rationale to support such approaches.

Chapter two describes a prospective study to validate a quality of life tool, the Adelaide Disease Severity Score. This study showed a simple 5 question tool directly related to sinus symptoms and visual analogue quality of life score correlated very highly with other more complex rhinological quality of life tools – the SNOT 20/22. It further correlated with radiological disease burden (Lund Mackay CT score) and endoscopic disease (Lund Kennedy endoscopic score) burden. This study validated our use of this tool to measure quality of life and symptom improvement in patients undergoing surgery.

Chapter three describes a detailed retrospective study of the outcomes of primary frontal sinus surgery. This is the largest study in the literature of

primary frontal surgery and forms the basis to support an approach where the diseased frontal sinus should be addressed surgically to optimize long-term outcomes. It also identified that certain anatomical factors such as a narrow frontal ostium seemed to play a role in persistence of symptoms. This raised questions as to whether these outcomes were as successful for revision and extended frontal sinus surgery. Were there identifiable risk factors for success and failure?

The fourth chapter describes the outcomes of primary and revision standard frontal sinus surgery and investigates which patient, anatomical and disease factors were poor prognostic factors for failure. It identified a select cohort of patients that would benefit not just from frontal sinus surgery, but extended frontal sinus surgery (EMLP) in the first instance.

The final chapter investigates the outcomes of extended frontal sinus surgery (EMLP) and seeks to determine the risk factors for its success and failure. This study found that the EMLP had excellent outcomes in the majority of patients, but there was a significant minority of patients that had persistence of symptoms. The relevance of the host immune system response to sinonasal microorganisms, and anatomical risk factors was also explored and lays open the basis for further study.