



MEDICAL IMAGING CLINICAL SUPPORT SERVICES

DEPARTMENT OF MEDICAL IMAGING



Gillian Nasato
Executive Director
Clinical Support Services

The Department of Medical Imaging (DMI) provides a full range of diagnostic and interventional imaging services. DMI actively undertakes clinical research in departmental, interdepartmental and multi-site collaborative research projects. Under the directorship of Professor Alan Coulthard, the DMI Research Office supports many departmental research projects and clinical trials while further supporting external, service-based research studies established by other RBWH departments or external research groups. Our consultants, registrars, radiographers and nurses all provide expertise on imaging protocols, clinical diagnosis and interventional procedures to best support these projects.

DMI has established strong research collaborations with local research institutes such as the Herston Biofabrication Institute, Queensland Brain Institute, the Centre for Advanced Imaging, QIMR Berghofer, HIRF, UQCCR and CSIRO. Over the coming years we hope to extend these research collaborations with international hospitals such as Mount Sinai Hospital in New York, as well as, collaborating with global industry partners.



Assoc. Prof. Karin Steinke
Acting Medical Director
Medical Imaging

Highlights of our research from 2019 include:

CONSULT Study: The aim of this project is to clinically validate custom-made tractography software. Images created by the software will assist radiologists and neurosurgeons in their pre-surgical planning of patients about to receive brain surgery. This project has been conducted in two stages. Stage One was completed in 2018 and Stage Two is reaching completion in 2019. The project has been a joint venture between DMI, Dept. Neurosurgery and CSIRO.

EPPICS Study: This year we completed a three-year clinical trial designed to identify the optimal means of keeping patients anti-coagulated during intercranial aneurysm procedures.

PICC Study: This radiographer-driven study is designed to determine the optimal vein size-to-catheter ratio to reduce the occurrence of thromboembolic events in patients with PICC lines.

Formalising the Interventional Oncology Unit: There has been a steady rise in the demand for interventional radiologists to treat cancer patients. The Interventional Oncology Unit was developed to help meet that demand and exists as an on-going collaboration between Medical Imaging and Cancer Care Services. This Unit has been formalised by the addition of a research nurse, who is supported by the by Cancer Care Services, but embedded within Medical Imaging. This additional research support has fast-tracked protocol development and data collection which will immediately contribute to a number of research initiatives currently under development.

Centre of Excellence for Interventional Neuroradiology – Progress is on-going to establish a process for First in Human Clinical Trials for medical devices used in interventional neuroradiology procedures such as treating unruptured aneurysms and clot retrieval.



Prof. Alan Coulthard
Director of Research
 Medical Imaging

The Medical Imaging Department has been fortunate to secure the opportunity to install four Spectral CT Scanners across the Herston Precinct. Once installed, the Herston Precinct will be the only site globally to contain this number of Spectral CT Scanners thereby providing endless opportunities to perform cutting edge imaging research. Collaborations with various universities and research institutes currently investing in artificial intelligence and deep-machine learning algorithms that integrate with imaging platforms are already being developed. In turn, this will give our imaging staff exposure to leading technology in diagnostic imaging.

2019 has been a dynamic time for research within the Medical Imaging Department. Our research has provided valuable insights into the standards of practice within the department by exploring new diagnostic and interventional avenues. The diverse range of clinical trials currently being conducted within DMI will lead to changes of practice which will directly affect patient treatment and care across all imaging modalities.

Supervised Post-Graduate Research Students

Name <i>(RBWH staff in bold)</i>	Current Studies <i>(e.g. PhD, Masters etc.)</i> University <i>(duration)</i>	Research Project Title	Supervisors <i>(RBWH staff in bold)</i>
Rachael Anstey	MPhil, UQ (2018-2020)	The Use of MRI and Ultrasound in Foetal Ventriculomegaly	Gail Durbridge
Muhammed Latif	MSc, Anglia Ruskin University, UK (2019-2020)	Magnetic Resonance Imaging	Catherine Westbrook
Kate Smith	MPhil, QUT (2019-2021)	The Impact of Patient Arm Position for Multi-trauma Patients with Upper Extremity Injuries	Karen Dobeli
Rebekah Onsley	MPhil, University of Sydney (2019-2021)	Image Interpretation (Specialty in CT imaging)	Karen Dobeli
Yi Jiun Yong	Graduate Certificate, University of South Australia (2019)	N/A	N/A
Jerry Casey	Graduate Diploma, UQ (2019-2020)	Magnetic Resonance Imaging	N/A
Cathy Chiem	MPhil, University of Adelaide	Image Interpretation (Specialty in Ultrasound and sonography)	N/A

RBWH Research Staff with research roles, positions or appointments: e.g. Coordinators, Fellow, Adjunct and Honorary appointments

Name <i>(RBWH Staff in bold)</i>	Type of Position	FTE	Funding Source <i>(operational/external/in-kind)</i>	Research Program	Affiliated University/ies
Alan Coulthard	Director of Research	0.1	In-kind	Directing research development for Medical Imaging – medical staff	UQ, School of Medicine
Marita Prior	Research Development Officer	0.5	Operational	Research development for Medical Imaging – medical staff, radiographers, nurses	N/A
Maria Sathi	Senior House Officer – Research	1.0	Operational	Research development for Medical Imaging – medical staff	UQ, School of Medicine
Janice den Elzen	Research Project Manager	0.8	Operational	Research development for Medical Imaging – medical staff, radiographers, nurses	N/A
Karen Dobeli	Senior Radiographer	0.05	Operational	Research development for Medical Imaging – radiographers	University of Sydney
Helen-Louise Morris	Research Nurse	0.4	External <i>(Cancer Care Services)</i>	Interventional Oncology Unit	N/A

Honorary Positions: e.g. Non-RBWH staff with research appointments at RBWH

Name	Position	Research Program	Affiliated University/ies
Daniel Zumsteg	Honorary Research Fellow	Factors Affecting Skeletal Muscle Cross-sectional Area in a Normal Population and Subsequent Outcomes After Traumatic Injury with Special Reference to the Elderly	UQ, School of Medicine
Everett Chu	Honorary Research Fellow	Factors Affecting Skeletal Muscle Cross-sectional Area in a Normal Population and Subsequent Outcomes After Traumatic Injury with Special Reference to the Elderly	UQ, School of Medicine
James O'Leary	Honorary Research Fellow	Factors Affecting Skeletal Muscle Cross-sectional Area in a Normal Population and Subsequent Outcomes After Traumatic Injury with Special Reference to the Elderly	UQ, School of Medicine
Phoebe Lam	Honorary Research Fellow	Factors Affecting Skeletal Muscle Cross-sectional Area in a Normal Population and Subsequent Outcomes After Traumatic Injury with Special Reference to the Elderly	UQ, School of Medicine
Rohit Rajendran	Honorary Research Fellow	Factors Affecting Skeletal Muscle Cross-sectional Area in a Normal Population and Subsequent Outcomes After Traumatic Injury with Special Reference to the Elderly	UQ, School of Medicine
Samuel Tan	Honorary Research Fellow	Factors Affecting Skeletal Muscle Cross-sectional Area in a Normal Population and Subsequent Outcomes After Traumatic Injury with Special Reference to the Elderly	UQ, School of Medicine
Amelia Bernard	Honorary Research Fellow	1. Splenic Embolisation Study; 2. Breast MR Coil Study; 3. Case Report in Microwave Ablation in Lung Cancer	UQ, School of Medicine
Camille Dunn	Honorary Research Fellow	1. Pancreatic Cysts; 2. Breast MR Coil; 3. CT Guided Lung Biopsy Study	UQ, School of Medicine
Dallas Platt	Honorary Research Fellow	Interventional Neuroradiology Database	UQ, School of Medicine

Current RBWH Research Group / Department Led Research Activity

RBWH Research Group / Department Led Researchers <i>(RBWH staff in bold)</i>	Collaborative Researchers and Others <i>(RBWH staff in bold)</i>	Research Project Title
Sathi M, M Fielder, J Hocking, N Waters, M Prior, A Coulthard	Dept. Medical Imaging	Bright Spots Study – Prospective study of clinically silent ischaemic events post elective endovascular treatment of intracranial aneurysms
M Fielder, J Hocking, M Prior, A Coulthard	R Jeffree (<i>Neurosurgery</i>), T Robertson (<i>Anatomical Pathology</i>), D Reutens (<i>Centre for Advanced Imaging</i>)	High field magnetic resonance imaging of hippocampal sclerosis
J Hocking, M Fielder, M Prior, A Coulthard	Dept. Medical Imaging	Enoxaparin for postoperative prophylaxis in intracranial coiling and stents (EPPICS).
J Hocking, M Prior, A Coulthard	Dept. Medical Imaging	Silent intracranial lesions in endovascular treatments (SILEnT).
M Fielder, N Waters, M Prior, A Coulthard	Dept. Medical Imaging	Verify Now Study – Effect of collection technique on platelet inhibition results.
H Thalagala, M Fielder, M Prior, A Coulthard	Dept. Medical Imaging	The effect of Grey Blanket Protocol on clot retrieval times
A Bernard, M Fielder, R Bains	Dept. Medical Imaging	The role of interventional radiology in splenic trauma
M Fielder, J Sommerville	R Sommerville (<i>ENT</i>), HIRF Centre for Advanced Imaging (<i>CAI</i>)	Perineural Spread of Head and Neck Cancers
J Sommerville, M Fielder	R Sommerville (<i>ENT</i>)	Utility of Black Blood MRI Sequence in Evaluating Perineural Spread in Head and Neck Cancers
M Fielder, A Coulthard	N Surendran (<i>Neurosurgery</i>)	Common Vertebral Artery Variants and their Clinical Implications
M Prior, A Coulthard, T Rajah	R Jeffree (<i>Neurosurgery</i>), L Reid, (<i>CSIRO</i>)	CONSULT – Predicting Surgery-induced Neurological Deficits using CONSULT
M Lu, P Jenvey, M Prior	J van de Pol, J Kinyanjui, L Daniel , (<i>Orthopaedics</i>), HIRF	Prospective assessment of graft incorporation and ligamentisation after anterior cruciate ligament (ACL) reconstruction using two different hamstring tendon fixation techniques.
T Mason, N Newman, M Prior	Dept. Medical Imaging	PICC Study – What is the optimal vein size-to-catheter ratio to reduce the occurrence of thromboembolic events in patients with PICC lines?
A Rao, S Gustafson, M Lu, F Sitheeque, M Prior	Dept. Medical Imaging	MR Enterography – Impact on image quality using split dose Buscopan

Collaborative Research Activity involving RBWH Research Group / Department

Collaborative Led Researchers	RBWH Researchers and Others <i>(RBWH staff in bold)</i>	Research Project Title
Brooke-Mai Wheelan (UQ)	Alan Coulthard, Marita Prior	Be Clear Online Study
Gail Robinson (UQ)	Alan Coulthard, Marita Prior	Stroke Study
Mark Midwinter (UQ)	Marita Prior	CT KUB and Trauma
Patrick Brennan (University of Sydney)	Karen Dobeli, Marita Prior	Advancing lung cancer detection in developed and developing countries
Mark Allenby (QUT/Herston Biofabrication Institute)	John Clouston, Marita Prior	An Intelligent Risk Stratification Software to Predict Intracranial Aneurysm Rupture
Reade deLeacy (Mount Sinai Hospital)	Ken Mitchell, John Clouston, Alan Coulthard, Kate Mahady, Marita Prior	PADUANO registry
Amanda Ullman (Griffith University)	Alan Coulthard	PICNIC Trial
Joanne George (UQ)	Jane Bursle	PREB)-6 Trial

Research Awards and Achievements

Recipient <i>(RBWH staff in bold)</i>	Award	Event
Donna Napier	Sonographer and Educator of the Year	2019 ASA Annual International Conference. Australia

Research Grants

Investigators <i>(RBWH staff in bold)</i>	RBWH Research Groups / Departments	Project Title	Granting Body	Total of funds awarded	Funds used in 2019	Years
Jennifer Sommerville, Ryan Sommerville, Matthew Fielder, Maria Sathi	Dept. Medical Imaging, Dept. of E.N.T	Perineural Spread of Head and Neck Cancers	RBWH Diamond Care	\$31,200.00	\$18,260.00	2018-2019
Lee Reid, Marita Prior, Rosalind Jeffree, Alan Coulthard, Thulasi Rajah	Dept. Neurosurgery, Dept. Medical Imaging, CSIRO	CONSULT – Predicting Surgery-induced Neurological Deficits using CONSULT	RBWH Diamond Care	\$15,500.00	\$4,920.00	2018-2019
Amanda Ullman, Patrick Harris, Andrew Bulmer, Rachael Walker, Naomi Runnegar, Tricia Kleidon, Paul Lee-Archer, Benjamin Pearch, Alan Coulthard (AI)	Griffith University, PAH, LCCH, Dept. Medical Imaging RBWH	PICNIC Trial	NHMRC	\$706,580.00	N/A	2018-2020
Joanne George, Alex Pagnozzi, Samudragupta Bora, Jane Bursle (AI)	University QLD, CSIRO, Dept. of Medical Imaging RBWH.	Prebo-6 Trial – Prediction of Childhood Brain Outcomes in Infants born Preterm using Neonatal MRI and concurrent clinical biomarkers	NHMRC	\$832,000.00	N/A	2018-2020
Craig Winter, Mark Allenby, John Clouston, Marita Prior	Dept. of Neurosurgery, Herston Biofabrication Institute, Medical Imaging RBWH	A Biofabricated Surgical Referral Suite to Predict Intracranial Aneurysm Rupture	RBWH and RBWH Foundation Research Project Grant	\$39,876.34	\$9,660.00	2019-2020

2019 Research Publications

Journal Articles

1. Roxbury T, McMahon K, **Wong A., Coulthard A, et al.** Brain activity during spoken word recognition in subacute aphasia. *Brain and Language*. (2019). DOI: 10.1016/j.bandl.2019.04.004
2. Wenderoth J, McAuliffe W, **Coulthard A, et al.** The Role of Interventional Radiologists in Acute Stroke Interventions: A Joint Statement from the Australia and New Zealand Society of Neuroradiology (ANZSNR), the Society of Neurointerventional Surgery (SNIS), the United Kingdom Neurointerventional Group (UKNG), the British Society of Neuroradiology (BSNR), and the European Society for Minimally Invasive, Neurological Therapy (ESMINT). *Journal of Vascular and Interventional Radiology*. (2019). DOI: 10.1016/j.jvir.2019.05.008
3. Black L, Baker K, Ponsonby A-L., **Coulthard A, et al.** A higher Mediterranean Diet score, including unprocessed red meat, is associated with reduced risk of central nervous system demyelination in a case-control study of Australian adults. *The Journal of Nutrition*. (2019). Vol149(8): 1385-1392
4. Pierot L, Jayaraman M, Szikora I., **Coulthard A, et al.** Standards of practice in acute ischemic stroke intervention: International recommendations. *Interventional Neuroradiology*. (2019). Vol 25(1): 31-37
5. Mander GTW, **Dobeli K,** Steffensen C, Munn Z. Diagnostic accuracy of computed tomography coronary angiography utilizing recent advances in technology in patients with high heart rates: a systematic review protocol. *JBHI Database System Rev Implement Rep*. (2019) Vol 17(7):1312-1318
6. **Harvey J,** Windsor MN, **Steinke K.** Delayed complications following microwave ablation of lung tumours. *J Med Imaging Radiat Oncol*. 2019 Dec;63(6):770-778
7. Lee A, Ellul D, **Sommerville J, et al.** Bony orbital changes in allergic fungal sinusitis are reversible after treatment. *Orbit*. (2019). DOI.org/10.1080/01676830.2019.1576740
8. **Fielding DIK,** Bashirzadeh F, Son JH, Todman M, Chin A, Tan L, **Steinke K,** Windsor MN, Sung AW. First Human Use of a New Robotic-Assisted Fiber Optic Sensing Navigation System for Small Peripheral Pulmonary Nodules. *Respiration*. 2019;98(2):142-150. doi: 10.1159/000498951
9. Sharpless M, **Mahady K,** Sullivan T. Conservative management of spontaneous intraorbital arteriovenous fistulas. *Clinical and Experimental Ophthalmology*. (2019). doi: 10.1111/ceo.13640
10. Cherian P, Blake C, Appleyard M, **Clouston J, Mott N.** Outcomes of radiologically inserted gastrostomy versus percutaneous endoscopic gastrostomy. *Journal of Medical Imaging and Radiation Oncology*. (2019) Vol 63: 610-616
11. **Napier D.** Ultrasound in the diagnosis of rib fracture following blunt chest trauma: a case study. *Sonography* (2019) Vol 6(2)
12. **Napier D.** Splenic artery aneurysm rupture in the pregnant patient - the importance of utilising ultrasound in differentiating the acute abdomen from obstetric causes of abdominal pain. *Sonography* (2019) Vol 6(3).

Books

1. **Scally P.** iBook Disease Profiler: The links from Pathology to Treatment. <https://itunes.apple.com/au/book/disease-profiler>.

Book Chapters / Letters

1. **Hacking C.** Aortic dissection in iBook Disease Profiler: The links from Pathology to Treatment
2. **Hacking C.** Hyperpituitarism in iBook Disease Profiler: The links from Pathology to Treatment
3. **Hacking C.** Pheochromocytoma in iBook Disease Profiler: The links from Pathology to Treatment
4. **Hacking C.** Seronegative arthropathies in iBook Disease Profiler: The links from Pathology to Treatment
5. **Steinke K.** Complications in Non-Vascular Interventional Therapy and Interventional Oncology, Thieme, 2019, ISBN: 9783132412873.

2019 Conference Presentations – Invited Speaker, Oral and Poster

Invited Speakers

1. **Clouston J.** Value-based Healthcare. IRSA ASM. Australia. 2019
2. **Coulthard A.** Queensland Experience with the new Derivo Flow Diverter. ANZ Stroke Solutions PEER Meeting. 2019
3. **Coulthard A.** Australian Experience with the ATLAS endovascular stent. NeuroSummit APAC Emerging Leaders' Segment. 2019
4. **Dobeli K.** CTCAE – CT chest acronyms explained. RADaim. Australia. 2019
5. **Dobeli K.** A close look at medications used for patient preparation in cardiac CT. RADaim. Australia. 2019
6. **Hacking C.** Emergency imaging of stroke. Everlight EverLearning Webinar series. Australia. 2019
7. **Hacking C.** Emergency imaging of stroke. Northern Ireland Registrar education night. Northern Ireland. 2019
8. **Hacking C.** Contrast injection techniques for trauma imaging. Australasian Trauma Society Trauma Conference. Australia. 2019
9. **Hacking C.** Trauma imaging Kahoot quiz. Australasian Trauma Society Trauma Conference. Australia. 2019
10. **Hacking C.** Trauma Radiology Workshop. Australasian Trauma Society Trauma Conference. Australia. 2019
11. **Hacking C.** CT brain and spine workshop. Social media and critical care (SMACC) conference. Australia. 2019
12. **Hacking C.** CT chest and abdomen workshop. Social media and critical care (SMACC) conference. Australia. 2019

Invited Speakers *(cont)*

13. **Hacking C.** Emergency Radiology: CXR. Pre-Internship (PRINT) Medical Conference. Australia. 2019
14. **Hacking C.** Emergency Imaging in Stroke. Herston State of the Art Healthcare Symposium. Australia. 2019
15. **Hacking C.** Radiology in Trauma: Tips and traps. TraumaTRAPS course. Australia. 2019
16. **Hacking C.** Paediatric emergency radiology. Australasian College of Emergency Medicine Autumn Symposium. Australia. 2019
17. **Hacking C.** TREW: Trauma, Radiology and Emergency Management Workshop. Queensland Trauma Symposium. Australia. 2019
18. **Napier D.** The role of ultrasound in the diagnosis of penile fracture. ASA Annual International Conference. Australia. 2019
19. **Napier D.** Splenic artery aneurysm rupture in the pregnant patient. Queensland Diagnostic Imaging Education Day. Australia 2019
20. **Newman N.** Radiology EDucation: Implementation of a Clinical Education Program. Medical Imaging Nurses Assoc Qld. Australia 2019
21. **Sommerville J.** Horse or Zebra? Case based review of common mimics in the head and neck - Sinonasal polyps. RSNA. 2019
22. **Sommerville J.** Neck nodes: What's new? ANZSNR. 2019
23. **Sommerville J.** Anatomy of the central skull base. ANZSNR. 2019
24. **Sommerville J.** Post-operative skull base. ANZSNR. 2019
25. **Steinke K.** MASERATI trial Combined SBRT and Microwave ablation for node-negative NSCLC. TROG ASM. Australia. 2019
26. **Steinke K.** Lung MTA Ablation - Planning and Troubleshooting. Advanced Ablation Workshop. Australia. 2019
27. **Steinke K.** Of dense breasts and more. Invited Lecture Annual I-MED QLD Radiology Imaging Conference. Australia. 2019.

Oral Presentations

1. Van den Heuvel, **Sommerville J.** Friend, Foe or Fake? Lymph node mimics in the head and neck. RANZCR ASM. 2019. New Zealand
2. **Gustafson S.** Exenteration audit review of R1 cases. RANZCR ASM. 2019. New Zealand
3. Benard A, Sathi M, **Steinke K.** "Microwave ablation for primary lung cancer – How many are too many?" RANZCR ASM 2019 New Zealand
4. Dunn C, **Sathi M**, Benard A, **Steinke K.** The evaluation of iatrogenic anatomic distortion of breast tissue landmarks on follow-up MRI due to a change in breast coil. RANZCR ASM. 2019. New Zealand
5. Dunn C, **Sathi M**, Mellam Y, Rich J, **Steinke K.** Clinical outcomes of CT-guided lung biopsy and diagnostic agreement with bronchoscopic tissue biopsy in suspicious lung lesions. RANZCR ASM. 2019. New Zealand
6. Dunn C, **Sathi M**, Mellam Y, Rich J, **Steinke K.** Clinical outcomes of CT-guided lung biopsy and diagnostic agreement with bronchoscopic tissue biopsy in suspicious lung lesions. RANZCR ASM. 2019. New Zealand
7. Thalagala H, **Sathi M**, **Steinke K.** "Understanding bubble-like subsolid pulmonary lesions on CT – a case series" . RANZCR ASM. 2019. New Zealand
8. **Prior M**, Reid L, **Coulthard A.** Validating tractography software called CONSULT. RANZCR ASM. 2019.

Poster Presentations

1. **Tusek X.** An Introduction into the use of intraoperative Computed Tomography in complex spinal procedures. ASMIRT. 2019
2. Devine M, **Gillespie J**, Kaniyur S, Gandhi M. Large nerve perineural spread involving the peripheral facial nerve divisions. ASHNR. 2019
3. **Cossens M**, Dunn C, **Gillespie J.** Improved quality of thyroid ultrasound reports following the implementation of the ACR Thyroid Imaging Reporting and Data System Nodule Lexicon. RANZCR ASM. 2019
4. MacManus D, **Gillespie J.** A pictorial review of 4D CT for localising parathyroid adenomas. RANZCR ASM. 2019
5. **Gillespie J**, MacManus D, **Lovell S.** Investigating Cauda Equina Syndrome: A Review of a Tertiary Trauma Centre's Experience. RANZCR ASM. 2019
6. **Gustafson S.** Upper renal tract imaging. USANZ. 2019
7. **Gustafson S.** Career experiences. RANZCR Qld Branch Meeting. 2019
8. Thalagala H, **Sathi M**, **Felder M**, **Hacking C**, **Coulthard A.** tA review of the effectiveness of a 'grey blanket' protocol for workflow improvement in acute ischemic stroke with large vessel occlusion. RANZCR ASM. 2019
9. **Hapugoda S**, Bekhit P, **Hacking C.** Liver trauma injury grading 2018 update: review of CT imaging features. RANZCR ASM. 2019
10. **Hapugoda S**, Bekhit P, **Hacking C.** Spleen trauma injury grading 2018 update: review of CT imaging features. RANZCR ASM. 2019
11. **Hapugoda S**, Bekhit P, **Hacking C.** Kidney trauma injury grading 2018 update: review of CT imaging features. RANZCR ASM. 2019
12. **Sommerville J.** Van den Heuvel J. Pitfalls in post-operative imaging in the head and neck. ANZSNR. 2019
13. Rich J, **Sathi M**, **Steinke K.** CT-guided microwave ablation for the treatment of primary lung lesions – efficacy based on lesion size and location. RANZCR ASM. New Zealand. 2019.