Dunedin 2022

Programme
&
Abstracts

ANZSNM New Zealand Branch Meeting 2022
Dunedin

Saturday 3rd September	
08:30	Registration, goodie bags, meet, greet, tea and coffee
	Chair: Dr Sue O'Malley & Dr Rachelle Steyn
09:00	**Welcome** Professor Rathan Subramaniam
09:05	**Karakia** Karen Roeske
09:10- 09:40	**Dr Elizabeth Baily Award Presentation** Prue Lamerton
09:40- 10:05	**The SeHCAT Study and Low Anterior Resection Syndrome – Can We Predict Response to Treatment?** Dr Cara Lucas
10:05- 10:30	**What Harry Houdini and the Sentinel Lymph Node of Melanoma Have in Common?** Dr Sonya Cameron
10:30- 10:50	**Morning tea** Sponsored by GMS
	Chair: Pru Burns & Jane Hassell
10:50- 11:15	**Molecular Imaging and Theranostics - What did We Learn in the Last Two Decades?** Professor Rathan M. Subramaniam
11:15- 11:30	Radpham Award **PET/CT in Sarcoidosis Diagnosis and Workup: A Patient Journey** Madeline Buttfield
11:30- 11:45	Radpham Award **A first Yttrium-90 Bremsstrahlung imaging experience with GE-NM/CT 870 CZT** Dr Rudresh Chandrashekar
11:45- 12:00	Paul Orr Award **Determining the Value of 68Ga-Nitroimidazole PET/CT Dual Time Point Imaging in Tuberculosis Hypoxia** Dr Philippa Bresser
12:00- 12:25	**Humour in Medicine** Professor Terence Doyle

12:25- 12:30	**Global Medical Solutions Presentation** Ray Pang
12:30	**Lunch** Sponsored by Siemens
	Chair: Dr Berry Allen & Professor Rathan Subramaniam
13:15- 13:35	**Cardiac Amyloid** Dr Sean Coffey
13:35- 13:55	**Prostate-Specific Membrane Antigen PET/CT for Prostate Cancer Management: Health Inequities in a New Zealand Population** Kari Clifford
13:55- 14:15	**Elemental: The Politics of Naming the Elements** Professor Lyall Hanton
14:15- 14:35	Sue O'Malley
14:35- 14:50	**General Electric Presentation** Peter Peralta
14:50- 15:15	**Afternoon tea** Sponsored by Alphatech
	Chair: Clare McKenzie & Prue Lamerton
15:15- 15:35	**Do I Know What my Radiation Dose is? Do I Know What Yours is? Do I Care?** Jeremy Nicoll
15:35- 15:45	**Siemens Presentation**
15:45- 16:45	**NZ Nuclear Medicine Discussion** ANZSNM

19:00	**Dinner Gala** Theme: Colourful Sponsored by GE

Sunday 4th September	
08:30	**Tea and coffee**
09:00- 10:00	**NZ Branch AGM**
10:00- 10:30	**Morning tea** Sponsored by Cyclotek
	Chair: Chrissie Roodt & Karen Roeske
10:30- 10:55	Sue O'Malley
10:55- 11:15	**Three Cases of Three P's: Pinholes, Precision and Palliation in 80 Days** Prue Lamerton
11:15- 11:35	**Bringing PRRT to New Zealand** Trish Mead and Yasmine Rennie
11:35- 11:55	**Perceived Barriers to Medical Imaging Technologists Being Able to Complete their CPD Requirements for Registration – A New Zealand Perspective** Clare McKenzie
11:55- 12:15	**Our Regenerative Journey** Madeline Buttfield
12:15- 12:30	**The Changing Landscape of the Gamma Camera … The Wellington Hospital Journey** Pru Burns
12:30	**Karakia** Karen Roeske
12:30- 12:35	**Thank You and Farewell** Chrissie Roodt
13:00	**Lunch** Sponsored by ANZSNM

* Posters will be up for the duration of the conference.

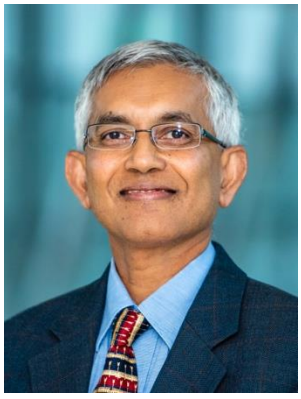
Notes

Notes

Guest Speakers

Dr Cara Lucas

Ko Tainui raua ko Takitimu oku Waka
Ko Ngāti Ranginui raua ko Ngāti Raukawa oku iwi
Ko Hangarau raua ko Kirihika oku hapū
Ko Hangarau raua ko Ūkaipō oku marae
Dr Cara Lucas is a 4th year Diagnostic Radiology trainee at Dunedin Public Hospital.



Professor Rathan M. Subramaniam

Professor Subramaniam is a Professor of Radiology and Nuclear Medicine at the University of Otago Medical School and a Consultant Radiologist and Nuclear Medicine Physician at Dunedin Hospital. He trained in Radiology at the Waikato Hospital, Hamilton, and in Nuclear Medicine at the Mayo Clinic, USA. He is the immediate past Dean of the Otago Medical School, held the inaugural Robert W. Parkey MD Distinguished Professorship in Radiology and Chief of Nuclear Medicine at the University of Texas Southwestern, Dallas, and Director of Clinical PET/CT at Johns Hopkins Hospital. He established and led the 177Lu DOTATATE and 177Lu PSMA theranostic programme at the University Hospital in Dallas. He is President of the PET Centre of Excellence of the Society of Nuclear Medicine and Molecular Imaging and has published over 255 peer-reviewed articles, eight books, and delivered more than 150 CME lectures and twenty named lectures. He co-chairs multiple international cancer clinical trials and received numerous international awards, including the Life Time Achievement Award of the American College of Nuclear Medicine and elected fellow of the Royal Society of New South Wales, Australia in 2022.

Professor Lyall Hanton

Lyall grew up in Mataura, Southland. He has an honours degree in Chemistry from the University of Otago and a PhD from the University of Cambridge. He is the Mellor Professor of the Chemistry at the University of Otago. His research is concerned with the structure and function of extended chemical systems with the aim of developing new advanced materials. His particular interests include metal-organic framework and supramolecular Chemistry, polymers and gels. The research team he works with successfully commercialised a wound healing gel for sinus surgery and received FDA approval and the CE mark for this product. Their start-up company Chitogel now employs 14 people and Chitogel is sold in New Zealand, Australia and the United States. He is a Fellow of the New Zealand Institute of Chemistry, the International Union of Pure and Applied Chemistry and the Royal Society of Chemistry. He works as a hazardous substance advisor to Fire and Emergency New Zealand and the Police.

Terence Doyle

Terence Doyle was formerly a Radiologist and Nuclear Medicine Physician. Now retired from active medical practice he is Emeritus Professor in the Department of Medicine, and Society of Apothecaries of London Lecturer in History of Medicine at University of Otago. He lectures widely on all aspects of History of Medicine and Science.

Kari Clifford

I am a Research Fellow in the Department of Surgical Sciences. I cover all areas of clinical research, with a focus on surgical outcomes. I am privileged to work with consultants in Surgery, Medicine, and Radiology. The major themes of my research are prehabilitation to improve patient fitness and post-surgical outcomes, the treatment of functional bowel disorders, and equity in healthcare delivery.
In the field of nuclear medicine I am involved with projects looking at the accuracy of emerging radiotracers diagnostic tools and socioeconomic disparities in access to scanning technology, such as PSMA PET scans for patients with prostate cancer in New Zealand.

Abstracts

The SeHCAT Study and Low Anterior Resection Syndrome – Can We Predict Response to Treatment? - Dr Cara Lucas and Chrissie Roodt

Can the nuclear medicine SeHCAT study can be used to predict if a patient with Low Anterior Resection Syndrome (LARS) will benefit from colesevelam, a bile sequestrant which reduces symptoms of bile salt malabsorption?
This presentation will outline the current research being undertaken at Dunedin Hospital to investigate the response to treatment of bile salt malabsorption in local patients with LARS, with a focus on the utility of SeHCAT testing in predicting this response.
Although improved treatment of low-lying colorectal cancer has led to improved life expectancy, one major complication which impacts quality of life is LARS. LARS is a constellation of bowel symptoms occurring after treatment for low rectal cancer, including urgency, frequency and incontinence. Colesevelam is a medication which is not funded in New Zealand and has been shown to improve symptoms in people with bile salt malabsorption overseas. If there was a test which could predict which patients would benefit from this medication, maybe this could change?
This presentation will outline the evolution of treatment for low rectal cancer, the symptoms and pathophysiology of LARS and its impact on quality of life.
The results of the SeHCAT tests which have been performed in Dunedin as part of the LARS research will be presented. As part of describing the SeHCAT test, I will outline the problem solving undertaken by Chrissie to create a formular which allowed the for the interpretation of the SeHCAT test in Dunedin.
The current quality of life data for this subset of patients will be discussed. And we will consider the utility of SeHCAT testing in this group of patients in the future.

What Harry Houdini and the Sentinel Lymph Node of Melanoma Have in Common? - Dr Sonya Cameron

Background: Currently, a sentinel lymph node biopsy is recommended when the Breslow thickness is equal to or greater to 0.8mm and should be considered in other cases on an individual basis. It is estimated that pre-operative imaging fails to identify the sentinel lymph node in 3-7% of cases. Failure to localise the sentinel node can result in a management dilemma with no established guidelines as to how to proceed.

Aim: To estimate the failure rate of pre-operative sentinel node imagining and the subsequent management strategies employed.

Methods: Lymphoscintigram data from patients in Dunedin hospital over a ten-year period was reviewed. Patient demographics and melanoma -specific data was collected. The rate of non-localisation of the sentinel node was calculated and the management strategies employed were examined. In addition, a convenience sample of melanoma surgeons across Australasia and Ireland were invited to complete an online survey to establish international practice when such cases are encountered. The cohort included plastic and reconstructive surgeons, general surgeons and head and neck surgeons respectively. Participants were identified via surgical colleges and professional organisations. The study was approved by the Human Ethics Committee of the University of Otago, Dunedin, New Zealand.

Results: The rate of non-localisation of the sentinel node by lymphoscintigram in Dunedin hospital was consistent with rates reported internationally. All patients were subsequently managed in the setting of a multidisciplinary meeting and underwent further imaging in addition to the recommended clinical follow-up. Responses to the online survey indicated similar management strategies were employed by melanoma surgeons across Australasia and Ireland.

Conclusion: Currently, there are no evidence-based guidelines as to how to proceed when pre-operative imaging fails to detect a sentinel lymph node in melanoma patients. The results of this study provide valuable information regarding the current practices of melanoma surgeons when faced with this dilemma.

Molecular Imaging and Theranostics - What did We Learn in the Last Two Decades? - Professor Rathan M. Subramaniam

Objective: To review and reflect on the advancements in the field of molecular imaging and theragnostics over the first two decades of 21st century and the challenges facing the field.

Abstract: This lecture will highlight and reflect on the lessons the field of molecular imaging and theranostics learned over the last two decades. The important landmark events which lead to advancement in molecular imaging technology, discovery of new radiopharmaceuticals leading to unprecedented approvals for human use by national regulatory agencies, growth and implementation of theranostics and improvement in patient care and outcomes will be discussed. It would further outline the challenges facing the field in the coming decades and anticipate contributions the field would make to human health.

PET/CT in Sarcoidosis Diagnosis and Workup: A Patient Journey - Madeline Buttfield

Cardiac involvement in sarcoidosis (CS) forms a large portion of sarcoid-related mortality. Cardiac PET- CT scans have proven to be a key diagnostic and management tool for CS. This presentation summarises a patient journey to evaluate steroid treatment outcomes through 18F-fluorodeoxyglucose (18F-FDG) based PET-CT imaging.

Material and Method: 58-year-old male with biopsy-proven CS was referred for PET/CT to determine pre-treatment metabolic activity. Previous CT imaging noted multiple pulmonary lesions. The patient subsequently completed three PET/CT scans over three years to assess treatment response. ^{18}F-FDG scans were completed after a 60-minute uptake period with diagnostic CT covering from the vertex to thighs. A keto diet with 12 hours of fast before radiopharmaceutical administration was followed. Standardized uptake values (SUVs) were used to establish baseline and monitor treatment response.

Findings: Initial imaging (2018) noted two FDG-avid left ventricular masses (SUV 10.5 and 7.8) consistent with CS, as well as multiple hilar nodes (SUV 7.1). Post-treatment imaging (2021) found new cardiac avidity (SUV 9.9). Post-revised treatment imaging (2021) demonstrated a complete metabolic response. Follow-up imaging (2022) noted sustained metabolic response. Known pulmonary nodules on all imaging remained stable in size, with no FDG avidity.

Conclusion: 18F-FDG PET-CT imaging is a suitable method for determining the efficacy of treatment for CS. It eliminates the need for additional biopsies while monitoring for metastatic disease simultaneously. In this instance, imaging findings led the patients' treatment journey resulting in a durable therapeutic response. PET/CT imaging was additionally helpful in monitoring lung nodules, ruling out pulmonary sarcoidosis and eliminating the need for routine surveillance.

A First Yttrium-90 Bremsstrahlung Imaging Experience with GE-NM/CT 870 CZT - Dr Rudresh Chandrashekar

Introduction: Yttrium-90 (Y90) is an efficient therapeutic radioisotope for tumour treatment due to its high-energy beta rays. However, due to the vast energy spectra of Y-90, its always been challenging for Y-90 Bremsstrahlung imaging with traditional Phtomultipliar tube-based Anger gamma cameras. In the last few years, the solid-state gamma camera with a Caediumium Zinc Telluride (CZT) crystal has changed the imaging experience due to its direct conversions of signals and high signal-to-noise ratio, which produces high spatial and contrast resolution in the images compared to the traditional Anger PMT-based gamma camera. This presentation explained our site's experience of post-Y^{90} Bremstrulung imaging, probably the first globally with the general electronics (GE)© NM/CT 870 CZT model.

Material and Method: A patient who received intra-arterial Y-90 microsphere therapy underwent pre-treatment planning imaging with Technitium-99m Macroaggregated albumin (99mTc-MAA) and hepatic contrast angiography. In addition, to evaluate the success of the treatment infusion, post-treatment bremsstrahlung images were taken using a CZT-based gamma camera and compared with pre-treatment images. Three-dimensional fused images (3-D) with the help of SPECT-CT were acquired and processed as per the vendor protocol to review Liver uptake.

Results: Pre-treatment radionuclide imaging, hepatic angiography, and post-treatment bremsstrahlung imaging all revealed identical liver morphologies. Moreover, bremsstrahlung pictures exhibited increased tumour-to-normal ratios of visible tumours with no extrahepatic activity.

Conclusion: Bremsstrahlung imaging generates high-quality images with a CZT-based gamma camera, improves overall image resolution, and effectively demonstrates intrahepatic radioisotope distribution and extrahepatic activity identification.

Determining the Value of 68Ga-Nitroimidazole PET/CT Dual Time Point Imaging in Tuberculosis Hypoxia - Dr Philippa Bresser

Introduction: Dual time point imaging (DTPI) in Positron Emission Tomography / Computed Tomography (PET/CT) has proven useful in some clinical contexts by offering better contrast resolution, subsequently leading to improved lesion detection. There is however uncertainty whether this holds true for low-grade uptake of radiopharmaceuticals such as that seen when targeting hypoxia in tuberculosis (TB) using ^{68}Ga-nitroimidazole. The purpose of this study was to investigate whether there was a difference in early and delayed hypoxic uptake in TB

lesions using ^{68}Ga-nitroimidazole PET/CT to establish whether DTPI added value in this context.

Methods: Twelve PET/CT scans from four positively diagnosed TB patients, prospectively recruited as part of a larger study, underwent DTPI after administration of ^{68}Ga-nitroimidazole. The radiopharmaceutical was prepared using the in-house ^{68}Ge/^{68}Ga generator. Semi-quantitative analysis including lesion to muscle (LMR) and lesion to blood (LBR) ratios were determined for both time points for lesions demonstrating increased uptake.

Results: The SUV_{mean} and SUV_{max} of the lesion and background decreased over time. There was rapid washout from the normoxic tissue. As such the LMR significantly ($Z = -2.942$, $p=0.003$) increased from a median of 1.39 in the early images to 1.60 in the delayed images. There was however a decrease in both LBRs consistent with slower blood pool clearance at the delayed imaging time point.

Conclusion: Delayed imaging yielded improved background clearance and increased LMRs and is thus recommended to image hypoxic burden in TB with ^{68}Ga-nitroimidazole PET/CT. These results require further clarification in a larger, more controlled study.

Humour in Medicine – Professor Terence Doyle
No abstract available

Cardiac Amyloid - Dr Sean Coffey
No abstract available

Prostate-Specific Membrane Antigen PET/CT for Prostate Cancer Management: Health Inequities in a New Zealand Population - Kari Clifford

Background: This study investigated the association of patient, societal, and health system related factors influencing access to Prostate-Specific Membrane Antigen (PSMA) PET/CT scans in a New Zealand population.

Methods: We performed a retrospective observational cohort study examining data for prostate cancer patients from the Southern District Health Board (SDHB) of New Zealand from 2017-21. Data were provided by the Prostate Cancer Outcomes Registry of Australia and New Zealand (PCORNZ). PSMA-PET/CT eligibility criteria were applied to patients based on international guidelines and clinical consultation. Patient demographic and clinical data were compared using logistic regression according to receipt of a PSMA-PET/CT scan for eligible patients.

Results: We collected data for 919 patients, (mean age 68 years, 92% NZ European). Differences were seen in multiple deprivation indices (Indices 9 and 10: 0% and 10% for those with and without scans, respectively) and NCCN risk group. We found 214 (23%) patients were eligible for a scan, of which 33 (15%) received a scan. There were no significant associations between patients' ethnicity, age of diagnosis, rurality, or travel time and receipt of a PSMA-PET/CT scan ($P>0.05$). Patients' multiple deprivation index was

significantly associated with the receipt of a PSMA-PET/CT scan [OR 0.79, CI (-0.4, -0.08); p<0.005].

Conclusion: Patient deprivation index is associated with receipt of PSMA PET/CT scan, highlighting inequities in healthcare provision for prostate cancer patients in a New Zealand population.

Elemental: The Politics of Naming the Elements - Professor Lyall Hanton

In 2019 Mendeleev's Periodic Table, the great icon of Chemistry, turned 150 years old. In Mendeleev's original Periodic Table, there were 63 elements whereas today there are now 118 elements. The International Union of Pure and Applied Chemistry (IUPAC) is the protector of this icon. It is responsible for establishing the names and symbols of the elements. However, IUPAC does take into account recommendations from those responsible for first discovering the element.

IUPAC rules determine that elements can be named after a mythological character, a mineral, a place, or geographical region, property of the element, or a scientist. This limited naming system, if a little self-serving, seems designed to prevent controversy. However, IUPAC has had to arbitrate on the names of elements where controversies have arisen due to the disputed priority of who provided the most conclusive evidence of first finding the element.

This light-hearted talk will explore the Periodic Table, the names of the elements and it will describe some of the naming controversies. Here gender- and geo-politics and a small town in Sweden have important roles to play.

Sue O'Malley
No abstract available

Do I Know What my Radiation Dose is? Do I Know What Yours is? Do I Care? -
Jeremy Nicoll
No abstract available

The Changing Landscape of the Gamma Camera … The Wellington Hospital Journey -
Pru Burns

From the 19 year old ADAC Forte gamma camera, to the state-of-the-art Siemens Intevo SPECT/CT was a jump similar from penny-farthing to electric mountain bike! From room renovations during a pandemic, to online applications training following the new camera installation, the journey was a roller coaster. The business case process alone was enough to put off the faint at heart – perhaps that's what the bureaucrats hope for, to drown you in paper work so in the end you just give up!
From our learnings, both good and bad, and some suggestions for future projects. A light-hearted look at the highs and lows of a successful gamma camera replacement program and installation.

Three Cases of Three P's: Pinholes, Precision and Palliation in 80 Days - Prue Lamerton

This presentation will cover three separate cases.
The first case looks at a change in protocol for Parathyroid imaging in our department including dual phase isotope with subtraction using pinhole collimation along with a closer look at what SPECT/CT is offering in addition to the static images.
The second case is a Tc99m PSMA scan and how the fusion with the MRI prostate can increase the accuracy of activity seen in the prostate bed including follow up on the patient.
The last case is a sentinel node breast scan on a Tairāwhiti, Gisborne patient who has had previous breast surgery 12 years prior. At Te Matau a Māui, Hawkes Bay we image sentinel node breast scans for our Gisborne surgeons only however this case has brought about a change in protocol due to the surprising sentinel node tracking and SPECT/CT scan.

Bringing PRRT to New Zealand – Trish Mead and Jasmine Rennie

The Ministry of Health approved an Auckland DHB National Services Application in March 2019 for the establishment of a National PRRT Service.
In the interim, an arrangement had been made to fund a number of patients to access PRRT urgently at Peter Mac Cancer Centre (PMCC) in Melbourne, Australia,
With the Covid-19 pandemic, PRRT had ceased for New Zealand patients as they were unable to travel to Australia.
There were a group of 'urgent' patients who had either just started treatment or were waiting to start. There was a very high chance of adverse outcomes and death from delays in this programme, due to the highly selected population of late stage and urgent cases.
So in August 2020 the Nuclear Medicine department at Auckland City Hospital were asked to set up an interim PRRT service and we treated our first patients on 24 September 2020.
In July 2021, the permanent PRRT service was confirmed and to date we have treated over 60 patients and administered over 150 Lutate doses.
In this presentation we will share our experiences of setting up the service and demonstrate the positive affect it is having on our patients.

Perceived Barriers to Medical Imaging Technologists Being Able to Complete their CPD Requirements for Registration – A New Zealand Perspective – Clare McKenzie

Objectives: To examine the attitudes of Medical Imaging Technologists (MITs) in Aotearoa New Zealand towards Continuing Professional Development (CPD) and their perceived barriers to completing CPD.

Methods: A literature review showed that limited research had been performed previously on this topic, and none had been conducted in New Zealand. An online survey was distributed by email via the New Zealand Medical Radiation Technologists Board (NZMRTB) to all MITs who hold a current Annual Practicing Certificate (APC).

Results: There was a 13% response rate to the survey. A key finding was that the barriers identified by New Zealand MITs - lack of time to complete the requirements, lack of access to sufficient funding, lack of knowledge around the importance of CPD and reflective practice, and a lack of understanding of how to complete the required feedback successfully -

were similar to those identified in international literature. The study also demonstrated that there was a lack of awareness among New Zealand MITs of the benefits of CPD and reflective practice.

Discussion/Conclusion:
This research suggests that further exploration needs to be done into the reasons why MITs in New Zealand remain largely unaware of the benefits of CPD and how reflective practice can benefit them professionally. The best programme to adopt to correct this knowledge deficit also needs to be found.

Our Regenerative Journey - Madeline Buttfield

Background : The medical industry is one of the largest contributors to plastic waste - generating over 1 billion kilograms of plastic waste every year, accounting for 4% of the global greenhouse gas emissions. Medical waste is eight times more expensive to process than general waste, with all local hazardous waste transported to Australia for incineration. This presentation summarises the pilot project we did last year to develop a sustainable plan to identify and recycle plastic waste at our PET-CT department.

Procedures: The major contributors to our departmental waste were classified as soft plastics, hard plastics, and medical waste. We incorporated our recycling strategy with Countdown©'s soft plastic program to dispose of identified plastic wastes in sterile packaging only. Small, hard plastics were contained within empty, clean milk bottles and recycled with the help of Auckland city council waste.

Findings: On average, a sizeable 70L rubbish bag was filled with soft plastics each week at our two PET/CT sites. In addition, four 2L milk bottles were typically filled each week across the two sites. Based on this, it has been estimated that through the recycling initiative, our department now prevents 7488L of plastic from going into landfill each year.

Conclusion: The recycling initiative has proven easy to implement within our busy PET/CT department. While further learning and work are to be done to refine our practices, this is a project that will be applied company- wide. In addition, further projects will be implemented to accurately quantify our waste and track the reduction of our carbon footprint.

Special Thanks to our Sponsors

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