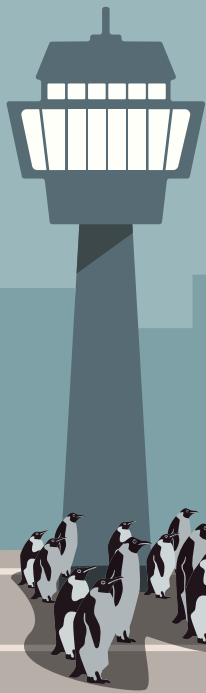


AEROSPACE MEDICINE: BEYOND FLIGHT

ASAM 2023 CONFERENCE

HOTEL GRAND CHANCELLOR HOBART

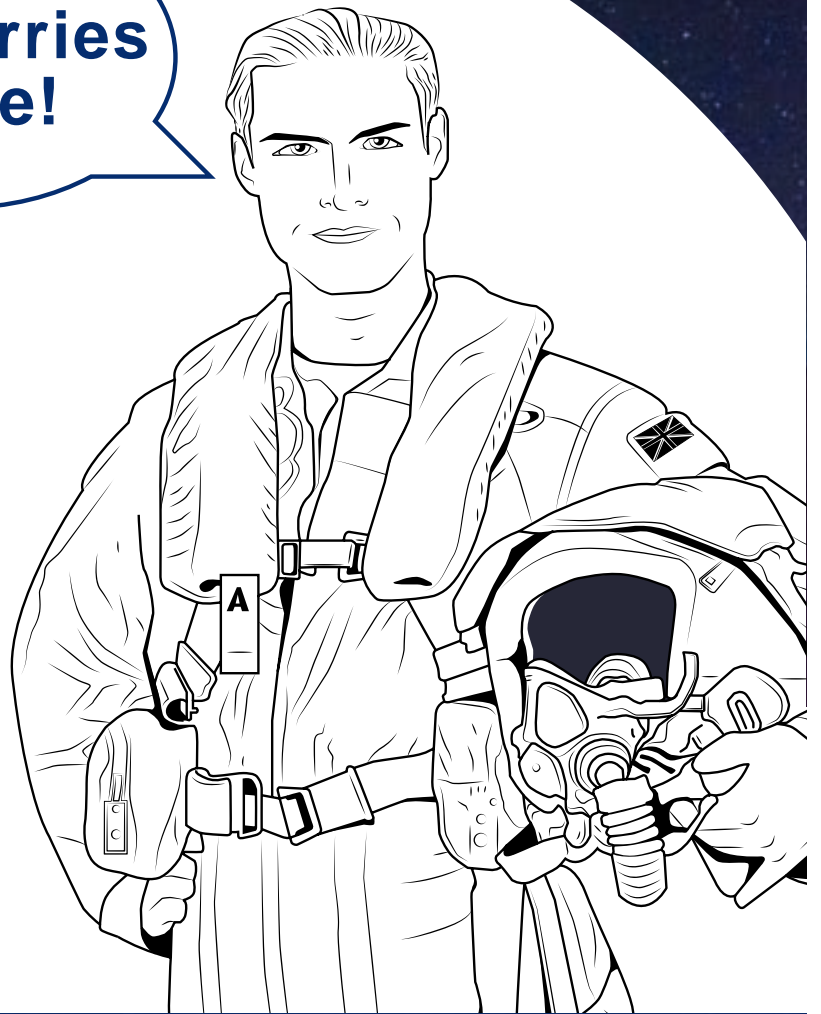
14 - 17 SEPTEMBER 2023



ABSTRACTS BOOK



No worries
mate!



ON-DEMAND?

GO₂Altitude®

Hypoxia and Physiological Training



Biomedtech Australia Pty Ltd
17 Roberna St Moorabbin VIC 3189, Melbourne Australia

info@go2altitude.com | ph: +613 9553 7200
www.hypoxic-training.com

CONTENTS

FRIDAY 15 SEPTEMBER 2023	4
JOHN LANE ORATION	4
SESSION 1 ABSTRACTS.....	5
SESSION 2 ABSTRACTS.....	9
SESSION 3 ABSTRACTS.....	13
SATURDAY 16 SEPTEMBER 2023	18
PATTERSON TRUST LECTURE.....	18
SESSION 4 ABSTRACTS.....	19
SESSION 5 ABSTRACTS.....	22

FRIDAY 15 SEPTEMBER 2023

0845 – 0945

JOHN LANE ORATION

Australia's Antarctic Program as a Space Analogue Dr Jeff Ayton

Dr Jeff Ayton commenced with the Australian Antarctic Division as Chief Medical Officer in 2002, with responsibility for the Australian Antarctic Program medical support and leadership of human biology and medicine research. Dr Ayton is Current Council Chair of the Centre for Antarctic, Remote and Maritime Medicine (CARMM).

In 1992, Jeff deployed for 13 months over winter at Casey Research Station, East Antarctica, as a remote generalist medical practitioner responsible for the comprehensive medical, surgical and dental care for 16 expeditioners totally isolated for the 9 month winter period.

Whilst overwintering he undertook immunology and epidemiological research. He has subsequently gained varied experience in other rural and remote medical practices as a procedural general practitioner obstetrician and anaesthetist including Rural Australia, Norfolk Island, and Papua New Guinea.

Dr Ayton is a past President and Chair of the Australian College of Rural and Remote Medicine (ACRRM)- the world leading college training and supporting rural and remote generalist medical practitioners.

Dr Ayton is an Adjunct Associate Professor at both the University of Tasmania and James Cook University.

Antarctica is a remote and extreme environment and is recognised as a hi-fidelity space analogue for models of medical support and research informing those planning long-term exploratory space missions. The total isolation over winter of up to 9 months, without hope of evacuation, requires comprehensive medical planning and solutions. Australian Antarctic leadership, medical training, support and research will be highlighted. Opportunity for further participation and contribution to Australasian Space and Extreme Medicine beckons!

1010 - 1230 (SESSION 1)

VASTITUDE

The Second Focus Colloquium on Space Life Sciences and Health: Showcasing Australian Experience in Space Medicine Dr John Cherry

Dr John Cherry is a Director of the Australasian Society of Aerospace Medicine (ASAM) and the Chair of ASAM's Space Life Science Committee. He is a member of the Australian Space Agency's Applied Space Medicine and Life Sciences Technical Advisory Group and he has previously worked for NASA and the European Space Agency developing medical support and training for astronauts. He is a Fellow of the Australian College of Rural and Remote Medicine, the Royal Aeronautical Society and the Royal Geographical Society and he currently works as an Antarctic Medical Practitioner for the Australian Antarctic Division where he remains actively engaged in Space Medicine research. In 2021 he completed an over-winter deployment with the Australian Antarctic Program as the wintering doctor at Davis Station and a summer doctor at Casey Station in Antarctica. Prior to medicine, he worked as an astrophysicist, commercial helicopter pilot, high school science teacher, and expedition leader.

Since the launch of the Australian Space Agency in 2018, Australian capabilities in Space Medicine and Space Life Sciences have grown substantially. The Australian Space Agency has cultivated a well-developed network of international experts through their Applied Space Medicine and Life Sciences Technical Advisory Group. This group has developed one of seven interconnected roadmaps which examine national civil space priority areas, focusing on Australian strengths and areas of national competitive advantage within the Space Medicine and Space Life Sciences domains. This process has highlighted the world-leading research, clinical systems and healthcare delivery that Australia has developed, while maintaining a focus on the future contributions our nation can make as human spaceflight extends further from Earth.

The Second Focus Colloquium on Space Life Sciences and Health will build on the work of the Australian Space Agency by bringing together Australia's Space Life Sciences community. The event is designed to strengthen existing collaborations and provide the opportunity for new initiatives in research and clinical practice.

The Focus Colloquium is the result of a well-developed collaboration between the Australasian Society of Aerospace Medicine, the University of Sydney, the Kolling Institute, the Australian Space Agency, the Civil Aviation and Space Authority and the Northern Sydney Local Health District (Arabanoo Precinct). This collaboration is testament to the multidisciplinary nature of the event which provides the opportunity to showcase unique Australian knowledge and expertise designed to support human spaceflight as astronauts begin returning to the Moon and looking onwards to Mars.

To infinity and beyond.... Dr Alicia Tucker

Dr Alicia Tucker is an Emergency Medicine and Diving and Hyperbaric Physician from Tasmania, Australia. Growing up on an island at the bottom of the world, the gateway to Antarctica, it was a natural progression for Alicia to become involved in Extreme Environment Medicine. Alicia has worked as a Retrieval doctor with the Royal Australian Flying Doctors Service, a Ship's Physician to Antarctica, an Event and Expedition Medical Officer and in International Medical Repatriation. Exploring Space Medicine was the next frontier for Alicia, and she has subsequently undertaken Space Medicine training both in Australia and Internationally at UTMB/NASA and with the European Space Agency. Alicia has additional qualifications in Aviation Medicine and is a Designated Aviation Medical Examiner and an Associate Fellow of the Australasian College of Aerospace Medicine and is currently developing the Altitude Physiology Training Program at the Royal Hobart Hospital's Department of Diving and Hyperbaric Medicine, where their chamber is also Hypobaric capable. Alicia has a particular interest in finding solutions to managing acute illness and injury beyond Low Earth Orbit and in the assessment and optimization of 'fitness to fly' for Commercial Spaceflight Participants.

If you believed what they show you in the movies, heading out for a spacewalk, or exploring a new planetary frontier is as simple as donning a perfectly fitted, fashion forward space suit and heading out the airlock.

Unfortunately, reality is not so straight forward. As humans, our bodies have not (yet?!) evolved to withstand the physical, physiological and psychological challenges of Space. In 60+ years of Spaceflight, we have been learning more about the risks and how to mitigate them, but we still have so much to learn.

The potential to develop Hypobaric/Altitude Decompression Syndrome whilst on a spacewalk, or Extravehicular Activity (EVA), is a very real risk for our Astronauts working on the International Space Station.

As we explore beyond Low Earth Orbit, on deep space and planetary missions, we will need to come up with new strategies to keep our Astronauts safe.

In this presentation, Dr Alicia Tucker will be reviewing the physics and physiology of decompression syndrome (DCS) and provide an overview of the current, and potential future, ways in which we can minimize the risk of DCS in Astronauts and other Spaceflight Participants.

From Earth to Orbit: How Teamwork Shapes an Astronaut's Journey Tori Tasker

Tori Tasker is currently the Australian Space Agency's Senior Space Technology Officer, leading human spaceflight, space medicine and life sciences. She is leading the Agency's study on value of an Australian human spaceflight program and the Applied Space Medicine and Life Sciences Roadmap. She is studying systems engineering at UNSW Canberra and is training to become a private pilot.

Tori has recently completed a Master of Business Administration and is an alumna of the Southern Hemisphere Space Studies Program (SHSSP2022) run by the International Space University and the University of South Australia.

Behind every successful mission to space lies the essential element of teamwork. In this talk, we will examine the intricate web of teamwork required to launch, operate, and return from space missions successfully.

Delving into the fascinating world of astronauts and their extraordinary journeys, examining how the power of collaboration, communication, and trust shapes their experiences. Drawing from experience of Australia's astronaut candidate, Katherine Bennell-Pegg, we will explore the critical role teamwork, and the team behind the astronaut, plays in every aspect of an astronaut's journey, from the rigorous training on Earth to the challenges faced in the vacuum of space.

One of the central aspects we will explore is the diverse set of roles that support a human spaceflight ecosystem. From mission control to ground crews, engineers, doctors, scientists, and astronauts themselves, each role plays a critical part in ensuring the success and safety of these missions. We will shed light on the challenges faced by each role and the collaborative efforts that enable humanity to reach new frontiers.

From Research Project to the European Space Agency: An Update on the Willis Island Spaceflight Analogue Dr Meg O'Connell

Dr Meg O'Connell is the current Medical Lead- Telehealth for Royal Flying Doctors Service Queensland Section. She has a passion for aerospace medicine and is a trainee with the Aerospace Medicine Training Program. In 2022 She completed her Diploma of Aviation Medicine, and was awarded the Dr. Gordon Cable Award for best space medicine presentation at the annual Australian Aerospace conference.

Introduction:

Willis Island is a remote isolated weather station located approximately 450km East of the coast of North Queensland, Australia. Six staff from the Bureau of Meteorology deploy for six-month rotations in isolated, resource limited, extremely remote circumstances. Like the International Space Station, research staff perform scientific experiments, weather forecasting and maintenance activities. Exploration medical support is provided by Royal Flying Doctors Service Queensland Service (RFDS) Telehealth Medical Officer and supported by an on island RFDS Medical Chest.

This Research project was presented at ASAM 2022 and won the Gordon Cable Award for best space medicine presentation. This presentation aims to update on the progress since then in turning this project into a longitudinal research project and how to turn your space idea into a research project. Creating this project led to an invitation to the European Space Agency Space Physician Training Course, and shared learnings and the opportunities available for further space research will be presented.

Conclusion:

Remote and isolated healthcare provided in Australia s represent a goldmine of useful data that can inform expedition and wilderness medicine, along with aerospace medicine. These research projects are able to be adapted and study to create meaningful research projects. Additionally, there are many opportunities to further your career in aerospace medicine in Australian and overseas.

1310 - 1450 (SESSION 2)

TOUGH TIMES NEVER LAST, BUT TOUGH PEOPLE DO

Pushing the envelope – the friction between ADHD and aviation Dr Carmel Cash

WGCDR Cash has worked as a permanent, uniformed psychiatrist in the Royal Australian Air Force (RAAF) since 2021. She first joined the RAAF in 2002 as a medical student, undertaking multiple postings, deployment and completion of FRACGP, before embarking on psychiatry training. She is based at RAAF Base Amberley, where her current role as RAAF Staff Officer Psychiatry includes provision of complex case and second opinion clinical services to all three services in South East Queensland, as well as input to organisational mental health policy and training delivery. She provides an Aviation Psychiatry clinic for serving members across the ADF via telehealth.

Global understanding and awareness of ADHD has rapidly shifted in the last 10 years. Increasingly inclusive societal attitudes, normalisation and reducing stigma have all contributed to an explosion of ADHD presentations, diagnoses and internet resources of widely varying quality. Historical medical beliefs that ADHD is a disorder of childhood alone, spontaneously resolving by age 18, are no longer supported internationally. And yet there remain many challenges for both the adult patient and their clinician – with regard to accessing diagnosis, restrictive treatment options, and navigating the inevitable social and occupational sequelae of diagnosis.

Possibly the greatest current challenge to accessing diagnosis and treatment in the aviation community is the likelihood that an ADHD diagnosis will be career-ending. There is a worrying potential for personnel to operate while undiagnosed, untreated or even on non-disclosed psycho-stimulant treatment – all of which carry their own performance and safety risks.

So, what does this changing environment mean for aircrew and controllers? In this talk, Dr Cash will provide a brief overview of the current relevant literature and clinical guidelines, followed by specific consideration of the implications, challenges and potential for future developments within the aviation setting.

Air Rage: The Role of Physicians Dr Trang Dao

Training: Harvard, Montréal and Paris Universities

Positions: CIUSSS, Est de Montréal, 2017-2022, Santa Cabrini, 2000-2022, McGill, 1990-2004

Psychiatry Expertise: Liaison, Trans-cultural, Aviation

BACKGROUND

Sixty years after the 1st air rage report in 1947, 66,000 cases were counted from 2007 to 2017. In 2018, air rages have caused flight disruptions every 3 hours, and one emergency landing monthly in the EU.

International bodies (ICAO, IATA, FAA, EASA) started to shift their focus away from hijacking and terrorism to publish the ICAO 1st Edition of the Guidance Material on Legal Aspects of Unruly Passengers (June 2019), very timely as the covid pandemic inflated air rage frequency and dangerousness to unprecedented levels worldwide.

In USA alone, during the pandemic (Jan-Sept 2021), 85% of flight attendants were involved in at least one incident, 58% handled over 5, and 17% were physically involved. The 150 cases/year average in decades increased to 6,800.

OVERVIEW

This magnitude is in fact massively minimized: most safety threatening behaviours were not reported in spite of mandatory reporting regulations, as exhausted staff prefer to avoid legal procedures. Indeed, Transport Canada statistics appear contrasting low.

More compelling are the responsibilities cabin crews endorse to manage unpredictable behaviours without the first responder safety trainings; mentally wounded travellers and bystanders are not eligible to compensations that are automatically granted to physical wounds.

OBJECTIVES

- 1 - Acquire awareness of potential physical and mental injuries during in-flight aggression
- 2 - Understand international convention complexities to defend victims's™ interest, and formulate treatment plans accordingly.

DISCUSSION

We will debate on the urgent needs of safety measure enforcements and prevention of eventual upcoming sanitary crises; concerted actions from all stakeholders; existing guidance materials improvement; and on physicians's™ roles.

TARGET AUDIENCE

All accountable ground personals, air crews, physicians, international authorities, States Members, airport managers, carriers, passengers, lawyers and more.

Holding Hands: Salutogenic Approach to Mental Health and Well-being Amongst Aviators Dr Sanjiv Sharma

Currently a senior medical officer at the Civil Aviation Safety Authority. Earlier served in the Indian Air Force and at the Singapore Aeromedical Centre. Formerly Professor of Aerospace Medicine, Rajiv Gandhi University of Health Sciences, India (2006-2010).

A recent convert to peer support and nascent practitioner of salutogenic approach to health and well-being. Currently a member of the ICAO's working groups on Mental Health and Problematic Use of Psychoactive Substances. Has avid interest in aeromedical decision making and aerospace physiology and human factors training.

A Fellow of the Australasian College of Aerospace Medicine (ACAsM), the Aerospace Medical Association (AsMA), and the Indian Society of Aerospace Medicine (ISAM); an academician of the International Academy of Aviation and Space Medicine (IAASM); and, a member of the Human Factors and Ergonomics Society (HFES), the Australasian Society of Aerospace Medicine (ASAM) and the Australasian Medical Review Officers Association (AMROA).

An aviation medical certificate holder in response to a stressful situation, has a diagnosis of adjustment disorder. Another one needed support during early days after an accident to help cope with the situation. Yet another one, impacted by the lack of opportunities due to COVID-19 pandemic, suffered from depression. Then there is the one who has a life changing event – loss of certification due to a medical condition. However, all these aviation medical certificate holders have one thing in common – an empathetic DAME. Alert about the stresses faced by those under their care, willingness to make difficult conversations, and if needed, discussions with the regulator, with the sole intent of assisting those going through turbulent times to regain or maintain their ongoing fitness for aviation.

Instead of seeing mental health, solely from a diagnosis, rather a pathogenic perspective, the DAMEs, using a salutogenic orientation, utilised available resources to nurture the individual and promote their well-being. Such salutogenic approach actively focuses on the individual's health and well-being on the health/dis-ease continuum rather than the disease.

This presentation aims to introduce the salutogenic approach to mental health and well-being in the aviation context. This includes brief discussion about the usefulness of peer support as a tool to complement the existing medical certification process, where the stakeholders continue to keep the focus on the aviator, rather than the incipient or diagnosed mental health condition. Such an approach to health promotion helps not just safeguard but enhance aviation safety.

A Paradigm Shift in Alcohol and Drug Issues in Aviation Dr Aparna Hegde

Dr Aparna Hegde is a Perth based GP with over 25 years of experience in Aerospace Medicine. She has qualifications in General Practice, Public Health and Tropical Medicine, Aerospace Medicine and Aeromedical Evacuation. Her background includes full time RAAF service as a SAVMO and Chief Instructor at RAAF IAM, a tenure with Emirates Airlines as VP-Aviation and Occupational Medical Services and part time public service with CASA. At present she is primarily employed in civilian practice as an integrative GP and DAME for a Wellness Clinic and has varied part time roles including public service with CASA and the RAAF Specialist Reserves as the Deputy Director of Aerospace Medicine. She continues to be associated with RAAF IAM as the WA based regional SAVMO and conducting hypoxia awareness training at RAAF base Pearce for 2FTS and 79SQN.

Drug and alcohol use is highly regulated in the aviation world. We have no idea of the true prevalence of Drug and Alcohol use, misuse and abuse due to the big stick approach and potential long term career implications. The problem is effectively underground and hidden and presents an even bigger problem to improve aviation safety. The use of Human Intervention Motivation Study (HIMS), a drug and alcohol prevention and rehabilitation program in conjunction with Addiction Medicine Specialists, motivated and supportive

DAMEs has been shown to facilitate a safer return to work. The aviator feels supported, there is effective monitoring and relapse prevention. Eventually this results in a cultural shift and problems are addressed early and safety is improved. I will present a case study that outlines how this has worked in practice.

1510 - 1730 (SESSION 3)

COLLAGE OF CLINICAL CASES

“Flying Gives me a Headache” Dr Ian Cheng

Ian is a Senior Staff Specialist in Occupational & Environmental Medicine based at Royal North Shore Hospital in Sydney. Ian also works in private practice specialising in Occupational and Aviation Medicine having previously consulted for IBM, QANTAS Airways and the Civil Aviation Safety Authority.

Ian is a Fellow of the Australasian Faculty of Occupational and Environmental Medicine, a Foundation Fellow of the Australasian College of Aerospace Medicine, an academician of the International Academy of Aviation and Space Medicine, a Fellow of the Royal Aeronautical Society and a past President of the Australasian Society of Aerospace Medicine.

A 53-year-old person who has flown extensively for work over 25 years develops “airplane headache”. The person’s risk assessment and management will be discussed.

2 Case Studies: Stroke and Subdural Haemorrhage Dr Pat Beresford

Dr Patricia (Pat) Beresford is originally from South Africa. Prior to studying medicine she attained a BSc honours and worked as a physicist for a number of years. She completed her MBBCh in 2007 and thereafter worked in the South African public hospital sector. She and her husband migrated to Victoria, Australia in 2011, where she worked as an SMO in Emergency for a number of years. She has also been involved in tutoring medical students at Monash University and University of Queensland. She moved to Brisbane in 2018 and joined CASA as an SMO in 2019, and continues to locum mostly in Emergency and ICU part-time. She was introduced to aviation by her husband, as a keen supporter of his aerobatics team in South Africa. She obtained her recreational pilot's licence in 2015.

Stroke, both haemorrhagic and ischaemic, carries a significant risk of recurrence as well as seizure. A number of factors may influence these risks. Similarly, subdural haemorrhage, both acute and chronic, confers an increased risk of recurrence as well as seizure. The presence of gliosis / evidence of haemosiderin on CT imaging may portend a poorer prognosis, with a relatively higher seizure risk. Seizure risk is aeromedically significant, with the potential for “excapacitation”, which may result in a catastrophic outcome if occurring in flight. In many cases a history of stroke may lead to refusal of or permanent restrictions attached to an aviation medical. I will present, in parallel, 2 case studies of 2 pilots who suffered stroke and subdural haemorrhage, respectively, and where the medical certification depended significantly on the findings on CT. This will include a discussion of the approach to risk assessment undertaken by CASA.

Pituitary Adenomas, their Aeromedical Significance and Certification Considerations

Dr Claude Preitner

Claude Preitner first graduated in engineering with a MSc before studying medicine in Switzerland, his country of origin. He eventually settled as a GP in his own practice at Rotorua – New Zealand in 1987. There he held a part time ENT Medical Officer position at Rotorua Hospital for many years. He has been involved with Occupational, Diving and Aviation Medicine since 1990. In 2001 he accepted a position as Senior Medical Officer with the Civil Aviation Authority of New Zealand and has been acting Principal Medical Officer over the past three years. He is FRNZCGP, FACASM, and a member of AsMA and ICASM. He currently lives in Nelson, commuting weekly to CAA in Wellington. He is the holder of a commercial pilot licence and is a past flight instructor.

Epidemiologic studies show that pituitary adenomas incidence is between 3.9 and 7.4 cases per 100,000 (NCBI publication).

These tumors are generally benign. Their clinical manifestations may be relatively innocent from an aeromedical perspective as they may be asymptomatic, being found incidentally, or present with symptoms of endocrine dysfunction such as infertility, decreased libido, galactorrhea, acromegaly or Cushing syndrome.

More serious from an aeromedical perspective are neurologic symptoms such as headache and visual changes due to mass effect on the chiasma and other structures. Hypopituitarism is common. Treatment may be by surgery, radiotherapy or via Dopamine agonists in the case of prolactinomas. Adenomas are classified as microadenomas if less than 1 cm in size and macroadenoma above that size. A rare but important complication from an aeromedical perspective is pituitary apoplexy, the result of infarction of the pituitary gland or adenoma, with or without haemorrhage.

Although pituitary apoplexy is usually spontaneous, one of the predisposing factors is treatment with dopamine agonists, especially bromocriptine and less so during cabergoline therapy. The likelihood of this complication increases with tumour size. We present cases representative of a spectrum of pituitary tumours, including a case of apoplexy, and discuss aeromedical certification.

Learning objectives:

1. Learn about pituitary tumours incidence and characterisation.
2. Learn about the related aeromedical risks.
3. Learn about risk assessment of pituitary tumours, and certification considerations.

Domestic Deafness or Something More? Dr Felicity Williams

Felicity Williams started her career as an undergraduate MO in RAAF through UNSW. Since then she has worked as an AVMO and GP with the ADF, both in Air Force and also as a contractor and has a keen interest in Aviation Medicine.

She holds post graduate qualifications including Family Medicine, psychiatry for General Practice as well as aviation medicine.

She is currently working in Canberra with Air Force.

This submission is about a case presentation of a pilot with asymmetric hearing loss. A mature aged RAAF pilot noticed decreasing hearing and had realised he was missing some conversations at home, with some suggestion of possible domestic deafness. After some prevarication the pilot presented to the local health centre for a check-up.

Investigations ensued, with MRI done to exclude pathology.

A diagnosis of acoustic neuroma was made.

The case presentation will go through the management of the condition, including treatment and employment impact, as well as more general, hopefully interesting information around the diagnosis, (i.e., symptoms, prevalence, natural history, and treatment advances).

It will also detail the specific occupational management undertaken in this case, and the ways that the potential impacts on flying career were considered.

Aeromedical Certification of Melanoma – CASA CPG Update Dr Ganesh Anbalagan

Ganesh is an Aviation Medicine and Occupational Physician. He works as a Senior Medical Officer at the Civil Aviation Safety Authority. His research interest is centred around developing evidence-based policy on aviation medical standards and the assessment of medical conditions for the issue of pilot and air traffic controller medical certificates. His training, academic qualifications and experience span the disciplines of Aviation Medicine, Occupational Medicine, Public Health, and Family Medicine. He is a fellow of the Aerospace Medical Association, the Australasian College of Aerospace Medicine, the Australasian Faculty of Occupational and Environmental Medicine, and the Academy of Medicine Singapore.

Australia has the highest age standardised incidence rate of melanoma in the world. Recent studies show an increased incidence of melanoma among aircrew when compared with the general population. Melanoma has the highest incidence of brain metastases among all solid tumours, may present with symptoms such as seizures, headache, and neurological deficits and can cause sudden incapacitation. Newer immuno-oncology agents have improved survival, but not all patients respond to treatment and there is a risk of mortality especially in advanced melanoma. Some patients may suffer from long-term adverse effects from systemic adjuvant therapy. Using the prognostic data from a large international melanoma database, annualised risk for melanoma post treatment was estimated and was used to update the CASA aeromedical certification guidelines. This presentation will cover the

aeromedical concerns of melanoma, CASA's approach to aeromedical decision making of melanoma and the risk assessment guidance chart.

High Grade Mitral Regurgitation: A freight dog's long journey back into the cockpit Dr. Oliver Brock

Undergraduate Social Sciences at the University of Hanover, Germany 1986

State examination Medicine at the Medical University of Hanover, Germany 1992

Promotional thesis about working conditions of flight attendants 1992

Specialist training Family Medicine/Occupational Medicine/ Aviation Medicine in Hanover and Hamburg

Different positions in major companies like Lufthansa German Airlines, German Post, City of Hamburg

Currently big own practice Hamburg for Family Medicine/ Aviation Medicine and Occupational Medicine

Senior medical examiner all classes EASA (since 20 years), CASA (since 16 years), CAA NZ (since 15 years)

Aeromedical presentations at various ICASM congresses since 1997), ASAM HKG 2013, ASAM SYD 2019, ASAM CME Sessions

Passionate active private pilot since >32 yrs with EASA and CASA PPL

A 34yrs old commercial pilot flying B757 freighters shows up for a regular class 1 renewal examination, 11 months after a Covid-19 infection with mild symptoms. The examination reveals a new 2/6 systolic murmur, which later becomes a 4/6 at the cardiological examination, LA is enlarged with 55mm. An endoscopic mitral reconstruction of the severe posterior mitral flail is being performed. After the operation during the initial cardiological rehab an aneurysma spurium, a retroperitoneal hematoma and a pneumopericard develop with a dramatic haemoglobin drop from 16 to 11 and is requiring intensive care.

6 months post-op aeromedical reassessment shows the LA high normal; EF is 74% and all other examinations are satisfying, the case is being referred to the national CAA. After a massive delay of another 5-month caused by CAA, finally fit to fly with conditions. A short comparison between EASA, CASA, and CAA NZ pathways in regard of this disease will be shown.

Take home message: early detection and successful therapy can still be counteracted by medical complications as well as administrative issues.

An Audit of the Aeromedical Assessment of Renal Stones Dr Lorenz Steinkohl

Hi, my name is Lorenz. I grew up in Germany and moved to New Zealand when I was 15. I studied medicine at Otago University and I am currently working in anaesthetics at Wellington Hospital. I'm fascinated by spaceflight and have always been on the lookout for a way to combine this interest with medicine. This is why I am hoping to become part of the aerospace medicine community.

I've moved around a fair bit throughout my life and picked up several hobbies along the way. I particularly like surfing and bike-packing around NZ's trails.

Background: The aeromedical assessment of renal stones requires a careful risk analysis. On the one hand, renal stones and the development of acute renal colic pose a safety hazard to air navigation. On the other hand, pilots must not be subjected to excessive investigation that may cause harm. Australia's Civil Aviation Safety Authority (CASA) provides a risk stratification and management guideline to aid decision making.

Aim: This quality improvement audit evaluated the extent to which the aeromedical examiners of an international airline followed this guideline.

Methods: A digital database query identified 42 pilots diagnosed with renal stone disease. A review of their medical records was conducted. Incidence and recurrence statistics were collected. The management of renal stone disease by aeromedical examiners was then compared with CASA's recommendations.

Results: Digitalisation of records was efficient for data extraction. Our results showed a high recurrence rate of renal stones and acute renal colic. Aeromedical decision making predominately followed CASA's guideline. However, many pilots were not formally risk-stratified, and surveillance protocols often differed from recommendations.

Conclusions: Using digital records greatly facilitates auditing and improving the quality of aeromedical assessment. Even in the small pilot population studied, recurrence rates confirmed the need for continuous surveillance of pilots with renal stone disease. Improved identification and documentation of risk status would ensure that appropriate surveillance screening occurs.

SATURDAY 16 SEPTEMBER 2023

0905 - 1005

PATTERSON TRUST LECTURE

Aviation & Emerging Infectious Diseases Dr Isaac Bogoch

Dr. Isaac Bogoch is an Associate Professor at the University of Toronto in the Department of Medicine, and an Infectious Diseases specialist and General Internist at the Toronto General Hospital with a focus on tropical diseases, HIV, and general infectious diseases. Dr. Bogoch works at the intersection of clinical medicine, epidemiology, public health, and policy. He divides his clinical and research time between Toronto and several countries in Africa and Asia. Dr. Bogoch also works closely with governments and public health agencies to combat emerging and re-emerging infectious diseases such as COVID-19, mpox (formerly monkeypox), and HIV.

This presentation will discuss the intersection between aviation and emerging infectious diseases and delve into recent emerging pathogens such as COVID-19, SARS, drug-resistant tuberculosis, and mpox (formerly monkeypox). We will look at transmission dynamics, and also discuss how public health can collaboratively work with the aviation sector to help predict and rapidly respond infectious disease outbreaks.

1030 - 1210 (SESSION 4)

THE EYES HAVE IT

Seeing Clearly with Colour Vision Deficiency Dr Tony Hochberg

Aviation Doctor with CAA New Zealand and CASA for many years including acting PMO New Zealand and currently Deputy PMO CASA. Aeromedical retrieval Doctor for hyperbaric injuries for 10 years. Fellow of Royal College of Physicians Ireland (Occupational Medicine) and trained in Family Medicine.

Abnormal colour vision is common. It is usually a congenital inherited defect for which there is no current remedy. It has long been recognised that it can be a handicap in a range of occupations in which colour is used to convey information.

Colour vision standards have been in force in civilian and military occupations for over 100 years and for the greater part of that 100 years there has been dispute and debate over the extent of the handicap caused by abnormal colour vision and the validity of occupational colour vision standards.

Colour Vision is important in commercial aviation and presents a safety risk in defined situations.

Colour vision deficiencies vary considerably in their nature and severity. The clinical assessment of colour vision deficiencies can be done at several levels: screening (to determine whether a deficiency exists, intermediate workup (to get an idea of the type and severity of a defect), and definitive workup (to determine the precise diagnosis of a defect and its quantified severity). Acquired and congenital colour vision defects need to be differentiated and assessed.

Colour Vision and Air Traffic Controllers – medical certification considerations Dr Tim Sprott

Tim has worked within the CAA NZ medical team since late 2018. Interests include pilot mental health and AOD programmes, insulin treated diabetes, as well as general aviation medicine.

5% of population (8% men and 1% of women) have some degree of colour vision deficiency. Colour vision in Air Traffic Control operations is required for tasks such as critical radar data block types and weather intensities, recognising and responding to conflict alerts within critical time constraints, and discriminating among different categories of conflict alerts.

The challenge is determining acceptable minimum safe and fair colour vision function requirements for ATC operations.

CAA UK published CAP 1429 “Analysis of European colour vision certification requirements for air traffic control officers”. This looked at the relationship between severity of colour

vision loss and the corresponding changes in visual performance when colour signals are involved using CAD vision testing.

Subsequently CAA UK published their Policy Statement “Colour Vision in Air Traffic Controllers”.

FAA has published acceptable colour vision standards for ATC operations based on CAD testing.

Two cases of air traffic controllers with congenital colour vision deficiencies are presented. CAA NZ has guidance for Medical Examiners for the assessment of colour vision in Class 1 & 2 applicants who fail Ishihara screening, but not for Class 3 applicants.

This presentation outlines how the CAA UK and FAA guidelines were applied in these two cases.

Learning objectives:

- Learn about the importance of colour vision in safe ATC operations
- Learn about the risk assessment of congenital colour deficiency in ATC operators
- Learn how CAA UK and FAA guidance was applied in these two cases.

Improving Test Re-Test Reliability for S-Cone Colour Vision with the CCT HD Cone-Isolation Contrast Test Dr Brianna Smith

Introduction: Acquired colour perception changes may occur prior to other signs of emerging aeromedically significant medical conditions, therefore it is recommended to re-test colour vision during routine aircrew physical examinations. The Konan Medical cone-isolation contrast test (CCT HD) is a standard test for colour vision screening, however it has significantly reduced test re-test reliability for S-cones compared with L- and M-cones. The aim of this study was to determine whether test re-test reliability could be improved for S-cones, without impacting reliability for L- and M- cones, by increasing the stimulus size, such that the image falls on the part of the retina with maximal density of S-cones.

Methods: Fifteen participants had their colour vision measured monocularly with three different sized stimuli (standard size, and two different increased sizes). Each participant then repeated these three tests. The difference in score between the two sessions for each cone type was calculated for each eye, and the mean of these differences was compared using a repeated measures ANOVA.

Results: Test re-test reliability was significantly improved for S-cones, with mean of score differences of 5.93 using the largest stimulus, compared with 10.96 for the standard size, with no significant change for L-(8.13 vs 8.68) or M-(7.14 vs 7.69) cones.

Conclusions: Increasing the stimulus size for the CCT HD such that the gap of the Landolt C stimulus falls on the part of the retina with maximal density of S-cones significantly improved test re-test reliability for S-cones, without significantly reducing test re-test reliability for L- or M-cones.

Characterising the Pattern of Colour Perception Changes During Sustained Mild Hypoxia Dr Alison Ryan

Dr. Alison Ryan is an Aerospace Medicine registrar and Senior Aviation Medical Officer with the Royal Australian Air Force. Since completing the Diploma of Aviation Medicine in the UK in 2020 she has worked for the RAAF Institute of Aviation Medicine in Adelaide and Brisbane. Alison studied medicine at James Cook University and is a Fellow of the Royal Australian College of General Practitioners.

As improvements in technology are integrated into aircraft, both pilots and mission controllers are required to process increasingly complex colours and symbology inputs to achieve mission requirements. Visual function, including colour vision is known to be particularly vulnerable to the effect of hypoxia. Especially under mesopic conditions, even mild hypoxia at altitudes that are considered to be within the physiological zone can cause a deterioration in colour vision. This presentation will discuss our current understanding of the effect of hypoxia on colour vision and the results of a recent study assessing the consequence of sustained mild hypoxia at an altitude of 8000ft.

Preventing Eye Disease in 2023 Dr Germaine Gock

Dr Gock completed her medical degree at the University of Sydney. Inspired by the intricate nature of the human eye and its impact on overall well-being, she pursued specialized training in ophthalmology at Sydney Eye Hospital followed by advanced training in Birmingham and Oxford, UK focusing her efforts on medical retinal conditions. With a deep understanding of the complex mechanisms underlying chronic eye diseases, she has dedicated her focus to early detection, intervention, and prevention. She firmly believes that by addressing the root cause of these conditions, long-term vision preservation can be achieved.

Outside of her practice, Dr. Gock enjoys spending time her golden retriever, exploring the open spaces of Sydney, and promoting a healthy lifestyle.

This presentation will be an update of the science and technology used by ophthalmologists in the early detection of chronic eye diseases. Excellent vision and good ocular health are basic requirements for pilots and air-traffic controllers. Learn to identify which clients are at risk of chronic eye diseases and when they should be screened for preventable, potentially debilitating eye diseases such as glaucoma, diabetic retinopathy and macular degeneration. Case studies will also be used to demonstrate the role technology plays in an ophthalmic practice.

1255 - 1415 (SESSION 5)

LIFE IS EITHER A DARING ADVENTURE OR NOTHING AT ALL

Re-attacking the 1% Rule for General and Recreational Aviation Dr Gordon Cable

Gordon is a Fellow of the Australasian College of Aerospace Medicine. He is co-founder and Head of Flight Medicine with Human Aerospace Pty Ltd and has had a long-standing role with the RAAF Institute of Aviation Medicine. Gordon worked on secondment at the Australian Space Agency 2020 – 2021 and now works part-time as Professor in the Practice of Space Medicine at Australian National University. He holds multiple Fellowships of professional aerospace organisations in Australia and internationally and in 2015 he was appointed a Member of the Order of Australia for contributions to aerospace medicine.

The so-called “1% Rule” has been a time-honoured approach to setting a threshold for aeromedical risk assessment worldwide. It requires that there be less than a 1% annualised rate of acute incapacitation for a medical condition to be considered for flight certification. The origins of this method date back to 1973 when it was proposed that pilot failures could be assessed in a similar way to other airworthiness requirements of jet transport aircraft, allowing an objective assessment of medical fitness. In 1982, at cardiology workshops convened by CAA UK, this idea was taken further with data contemporary at the time and the 1% Rule was born.

It is widely recognised that this approach has its limitations. Its derivation was based on data from more than 40 years ago such as the all-cause fatal aircraft accident rate at the time, it was specific to multicrew wide-bodied transport aircraft, and many assumptions were made in calculations. Regulatory authorities both civilian and military therefore tend to apply the rule flexibly when assessing medical risk in other aviation safety sensitive activities such as private flying and air traffic controllers.

This paper will review the derivation of the original 1% Rule, discuss its limitations, and propose a new objective risk threshold for general and recreational aviation in Australia using contemporary data and operational factors specific to that group of aviators.

The Role of Peer Support Within the Salutogenic Construct Capt. Laurie Shaw

Laurie is an A350/A330 Captain with Fiji Airways. Over the past 15 years Laurie has been actively involved with the global pilot profession in developing and evolving approaches to well-being.

He was the founding Chairman of the HIMS Australia in 2014. In 2019, Laurie assisted in the development and implementation of the Peer Assistance Network (PANHK) for the Cathay Pacific Airways Pilot Group.

Laurie is active with various organizations, including the International Federation of Airline Pilots Association (IFALPA), specifically around mental health and wellbeing best practice for the global pilot community. He is currently assisting Airservices Australia in developing a multi-layered peer support and wellbeing program for their employees.

With our brains natural tendency to catastrophize, the fear of reprisal from the employer or perhaps even worse, the fear of revocation of their medical certificate by CASA has traditionally led to under reporting or early disclosure by Pilots and Air Traffic Controllers to their DAME on a wide range of potential physical or mental health issues. An undiagnosed condition may remain hidden and continue to deteriorate for some time until the occurrence of a critical incident, such as a DAMP related event or an operational incident with the resultant investigation and possible consequences.

A collaborative, stakeholder supported, risk mitigation process built on Safety Management System principles is enabled by a robust Peer Support Program which creates an environment to allow early reporting, appropriate treatment, and an expeditious return to the workplace. This is achieved in this “SafeSpace” by a tripartite relationship between the Peer Supporter, the CASA accredited DAME/Specialist Panel and Pilot/Air Traffic Controller under appropriate guidelines and supervision with the regulator remaining at arm’s length.

This presentation will introduce the practical application of this model into an existing Peer Support Program. It will be co-presented by a Pilot who will describe his journey of the regulatory system requirements with a psychiatric diagnosis and his continued journey within the “SafeSpace” model.

Medical Clearance - Why it's important, and what happens if you don't have it Alex Leedham

Alex Leedham is the Aviation Health Specialist for Virgin Australia. She is a Registered Nurse by qualification with a background of Aeromedical evacuation, training, complex case management and health leadership. Prior to her role at Virgin Australia Alex served for 15 years in the Royal Australian Air Force, a role she has retained as a specialist reservist.

Virgin Australia Group Medical presents the following topic:

- Why patients need a medical clearance
- What happens if they don't
- What happens when a medical event occurs on a Virgin flight:
 1. MedAire
 2. Medically Qualified Volunteers
 3. Emergency Medical Kit
 4. Safety reporting
 5. Medical clearance prior to return flight (if applicable)

Case studies to present:

- Medical clearance identifies challenges for guest travelling
- Guest without medical clearance travels, has in flight event

- MQV saves the day

What is Virgin doing to improve the clearance process:

- Online form

- SSR codes

- Working groups for targeted issues

'Can you smell that?' Aeromedical considerations of Anosmia Dr Richard Costelloe

Dr. Richard Costelloe is an Aerospace Medicine Registrar with the Royal Australian Air Force, at the Institute of Aviation Medicine. Richard has completed USAF Flight Surgeon training, and the Diploma of Aerospace Medicine at King's College London. He studied medicine at the University of Notre Dame Sydney and is a Fellow of the Royal Australian College of General Practitioners. Curious about flight, beginning as a toddler picnicking at Kingsford Smith, he is currently interested in the challenges that flight and diseases place on the aviator. His current research explores the cognitive impacts of COVID-19 in aviation related roles.

Anosmia is a frequent occurrence in diseases such as COVID-19 and maxillo-facial trauma and has been identified as a potential aviation safety issue by the FAA. This presentation explores Olfactory Dysfunction and provides a structured, evidence-based insight into the associated conditions, clinical management and aeromedical advice for clinicians and aviators.