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Editorial

CASA AND COST RECOVERY

Cost recovery is now generally accepted as being an essential requirement of all Australian Government departments. What about the cost recovery process for the aviation medicine section within CASA? Much of the planning behind this remains unknown to the aerospace industry and ASAM has not been consulted, despite being the major organisation representing Designated Aviation Medical Examiners (DAMEs) and Designated Aviation Ophthalmologists (DAOs).

There is a public expectation that proposals for cost recovery would be appropriately staffed within a government department. The Department of Finance and Treasury advises that, should cost recovery exceed $5m or if significant industry concerns were anticipated, a Cost Recovery Impact Statement (CRIS) should be prepared for the relevant Minister.

There was an outcry from the aviation industry following CASA's 2005 decision to impose a processing fee of $130 for every aviation medical. ASAM wrote to the Minister for Transport and Regional Services seeking confirmation that a CRIS had indeed been developed. No response has yet been received on this issue. Given CASA's response of reducing the fee to $75 from 1 July 2007, it is probable that such an impact statement had not been performed. Based on a turnover of 30,000 medicals, the cost of running CASA aviation medicine section appears to be in the order of $2 million per annum. This low cost is consistent with comments from past Directors of Aviation Medicine that the aviation medicine section has been frugally funded for many years. It would be interesting to know the additional actual staffing required and costs incurred for the processing and auditing of the aviation medicine fees.

Now CASA has put on hold (presumably until after the Federal election) a proposal to introduce a fee of $130 for the purposes of certification or re-certification of medical practitioners as DAMEs or DAOs. The frequency (currently four years) and cost of certification remains the prerogative of CASA. Most DAMEs and DAOs perform aviation medicals as a service to the industry; only a few derive significant income from this source. Many DAMEs have privately indicated they would cease seeking appointment if this fee is imposed as it offers nothing apart from a public listing of approved practitioners.

As a further cost recovery measure, CASA has proposed delegation of issue of Class 2 certificates to DAMEs. Although CASA declared highest priorities involve services for fee-paying passengers, the unilateral decision to delegate Class 2 certification raises the question as to whether CASA understands the important role of medical certification in aviation safety assurance. Any reduction in consistency in medical examinations may result in development of unacceptable standards, as occurred in New Zealand.

From a whole of government perspective, any apparent savings for CASA are likely to be offset by the cost of investigating even one additional private pilot aircraft accident.

CASA is increasing the administrative requirements placed on DAMEs and DAOs. Uniquely, CASA requires examiners to purchase its medical examination forms. The CASA web-based medical records system (MRS online) is still inefficient. CASA also expects DAMEs to issue invoices to applicants on its behalf although DAMEs are not CASA staff. CASA intends to delegate its responsibilities for Class 2 medicals and may introduce a fee for certification of DAOs and DAMEs. CASA appears to be oblivious of the Red Tape Task Force, established by the Prime Minister and the Minister for Health and Aging in May 2003, to reduce administrative burdens on medical practitioners.

In addition, the $75 fee imposed on applicants for medical examination is hardly equitable. Those who require six-monthly recertification by CASA for medical reasons (usually just for confirmation of health status) will be charged on each occasion. Yet the medical examination is in essence only a component of licensing. Currently, CASA issues a pilot licence for life with the only requirement for renewal being a valid medical certificate - with only minimal requirement for demonstrated continued proficiency in some specified flight regimes.

There may be benefit for CASA to adopt equivalent processes to those used by State and Territory motor vehicle licensing authorities. These usually issue licences for defined periods and charge fees to cover the costs of processing and renewal. An expiry date ensures currency of an identifying photograph. Given that security is now a major concern in aviation, contemporary photographs on pilot licences are essential. This consideration should prompt CASA to reassess its cost recovery strategy. CASA could follow the example of motor vehicle licensing authorities by advising applicants at renewal of any requirement for medical examination. A medical examiner would complete an independent medical examination and charge the applicant an appropriate fee. Licensing fees would remain a transaction between the applicant and the licensing authority, while the cost of associated medical certification or recertification, would properly reside between applicant and examiner.

Warren Harrex

Rearward facing seats have been used in aircraft and airships for many decades. There are numerous images of the interior of hydrogen and helium airships showing seating arrangements not dissimilar to a dining room or lounge area in a club. In addition, there have been many airframes with at least some seats facing rearwards. Examples would include; RAF VC-10 – all seats facing rearward, BAC1-11, Trident 1E 2, & 3, V951 Vanguard, Comet-4 1970, ATR-42\(^1\), B727 1975, Bell 206 Jet Ranger\(^2\), the Lockheed Electra, VC-10 C1 1966\(^3\), C-141, C-5\(^4\) and the Apollo Command Re-entry module\(^5\). The RAF adopted rearwards facing seats as early as 1945, as this seating arrangement was recognized as allowing higher (survivable) impacts in the event of an accident\(^4\).

Various bodies have discussed whether rearward facing seats should be mandated\(^6\), generally concluding they would not be accepted, either because of unpopularity with passengers – as travellers generally dislike travelling backwards, or with airlines - due to the high(er) costs of converting and building this type of seating.

Abstract

Despite the evidence that rearward facing seats confer increased crash survivability they remain little used in general aviation. This article reviews the engineering aspects, forces involved during crashes, and the advantages and disadvantages of rearward facing seats.

Rearward facing seats require significantly different engineering requirements. As a consequence, this results in increased weight and costs. In addition, most passengers are reluctant to "face backwards" when being transported.

Any decision to implement widespread use of rearward facing seats would most likely require legislation on behalf of civil aviation authorities worldwide.

Apart from cost and engineering considerations, there is debate as to whether rearward facing seats confer increased survivability in an aircraft accident. Although it would appear that rearward facing seats confer increased tolerance to isolated test subjects\(^7,8\) the survivability data is confounded by the increased vulnerability to the lethal impact of cabin projectiles\(^9,10\). There is a paucity of reports that indicate that rearward facing seats confer increased survivability, however the M1–Kegworth disaster in 1989 investigation reports\(^9,11-12\) were supportive. Further evaluation of the safety of rearward facing seats is required\(^10,13\).

Engineering differences between rearward and forward facing seats

The vast majority of aircraft seats are designed to be forward facing. The current seating standards for new airline seats mandate that passenger seats meet improved survivability standards, whereby the seat remains structurally intact for impacts up to 16G. The Federal Aviation Administration (USA) has not made retrofit of these new (16G) seats compulsory, and the balance of the older seats are designed to withstand -9G\(_x\), +5G\(_z\) & \(\pm 3G\(_y\)\) (and prior to this -6G\(_x\)) impacts.

The forward facing 16G seats are designed to withstand up to -16G\(_x\) and +16G\(_z\). In addition to the structural integrity of the seat, the passenger restraint system (two-point lap belt) and the seat floor track...
Rearward facing seats

attachment must also be rated to withstand the same G-forces. It should be noted that the -16G\textsubscript{x} rating for this seat applies only when the seat is facing forwards. The same seat when rotated to face rearwards will not withstand the same acceleration.

An engineering analysis of forward and rearward facing seats

To illustrate the markedly different force vectors and turning moments directed through an aircraft seat, Figure 2 compares the crash dynamic forces for a -16G\textsubscript{x} acceleration applied to a standard passenger seat facing forwards and then backwards. Assumptions include:

- Mass of passenger = 70 kg
- Mass of torso, upper limbs and head = 50 kg
- Mass of lower limbs = 20 kg
- Centre of torso mass is at heart level
- Seat dimensions as per diagram\textsuperscript{17}
- Seat back mass = 2 kg\textsuperscript{17}
- Force = mass × acceleration Kg ms\textsuperscript{-2} (Newton’s second law)

In the case of the rearward facing seat, there is an enormous increase in the turning moment exerted upon the seatback during a crash deceleration sequence (an increase of 36.7 times). Clearly, the seat back in a rearwards facing seat will need to be engineered to a much higher rating. The rearward facing seat thus presents a significant problem relating to engineering, weight and cost. The requirement for increased strength of rearward facing seats has been documented in studies by the U.S. Navy\textsuperscript{15}.

Restraints and rearward facing seats

Applying Newton’s first law of motion to an aircraft passenger we can say; an occupant of an aircraft seat will tend to remain in uniform motion (or remain at rest) unless acted upon by an external force. Application of a -G\textsubscript{x} acceleration force to an occupant of a forward facing aircraft seat will result in them being “flung” forward into the restraint harness. The tolerance to this type of acceleration is dependant on the type of harness being used\textsuperscript{7}. Passengers are usually only provided with a two-point harness which allows the torso to rotate forward. The resultant impact is between the head and seatback of the adjacent seat, or the torso and the passenger’s femurs. There is a high risk of severe head injury and femoral

Figure 2. A comparison of the force vectors sustained at the engineering limit for a standard seat.

The -16G\textsubscript{x} vector force is an inertial force exerted on the passenger and the seat during an accident. For purposes of simplicity the +G\textsubscript{z} force vector has been omitted in the crash scenario. The aircraft seat is exceptionally strong in the box section and is weakest at the junction of the seat back with the seat pan. This junction is a fulcrum point (shown as \textgreater). The vector force exerted on the seat is exerted at a distance from the fulcrum. The combination of a force vector acting at a distance from a fulcrum creates a turning moment – the product of force (F) times perpendicular distance (d) - measured in Kg ms\textsuperscript{-2}.m or the Nm.

(a) The forward facing passenger is held by a two-point restraint. The torso mass rotates forward into the horizontal, effectively transferring the inertial force of the torso through to the seat via the restraint. The restraint attachment is at the junction of the seat pan and seat back. As this force is exerted at the fulcrum there is no turning moment exerted by the torso. The turning moment exerted around the fulcrum is due to the accelerating back rest mass:

\begin{align*}
\text{Moment} & = F \cdot d \\
& = m \cdot a \cdot d \\
& = 2 \, \text{kg} \times 16 \times 9.8 \, \text{ms}^{-2} \times 0.35 \, \text{m} \\
& = 109.8 \, \text{Nm}
\end{align*}

(b) The rearward facing passenger, remains sitting vertically in a -16Gx acceleration. The accelerating passenger mass exerts a force vector approximately 0.5m above the fulcrum (the centre of mass for a human torso is near the level of the heart). In this case the turning moment exerted around the fulcrum is:

\begin{align*}
\text{Moment} & = m \cdot a \cdot d \\
& = 50 \, \text{kg} \times 16 \times 9.8 \, \text{ms}^{-2} \times 0.5 \, \text{m} \\
& = 3920 \, \text{Nm} + 109.8 \, \text{Nm} \\
& = 4029.8 \, \text{Nm}
\end{align*}
Rearward facing seats

This should be compared with a rearward facing seat where the high \(-G_x\) acceleration force is applied over the entire back of the passenger. There will initially be only minor forces applied to the passenger from the restraint with a significantly decreased incidence of restraint injury. The restraint will hold the passenger in place and prevent them being flung aft-wards during rebound. The acceleration force during rebound is significantly less in magnitude.

**Head rests and rearward facing seats**

Rearward facing seats *must* have high backrests to prevent cervical spine hyper-extension during a \(-G_x\) acceleration. The current seatback height at approximately 0.7 m\(^{17}\) is too low for a large proportion of the adult population and would need to be higher\(^6\). The 95\(^{th}\) percentile for sitting height is 0.925 m for females and 0.994 m for males (US figures)\(^{18}\).

**Human tolerance to short duration acceleration**

Human tolerance to short duration acceleration is dependant on multiple factors\(^7\), including:

- Magnitude of acceleration,
- Rate of onset,
- Direction of force vector,
- Site of force vector application

During an aircraft crash the aircraft experiences an opposing force of (very) short duration usually between 0.1 to 0.5 seconds\(^7\). The effects of short duration acceleration depend on the velocity change induced in the body and the structural strength of the body part upon which they act.

Acceleration tolerance (or dynamic response) in an individual is dependant on different factors, and they are effected at different phases of the acceleration pulse duration\(^7\). In simplistic terms the response is dependent on:

- The velocity change (or “jolt”) between 0.001 to 0.25-0.3 seconds,
- The acceleration pulse length between 0.25-0.3 to 3-10 seconds,
- The peak acceleration duration from 3-10 seconds onwards.

The overlap between the three phases reflects differing dynamic responses between individuals and also differing results obtained from one observation set to the next. The tolerance to whole-body impacts has been measured and these different phases are seen in Figure 4.

An occupant sitting in a rearward facing seat will not experience the high- magnitude, dynamic overshoot deceleration from the whiplash of their torso and head. They will initially decelerate at a lower rate than the fixed aircraft seat (assuming the seat remains attached to the floor) and then at a slightly higher rate than the seat, as there still remains the effect of dynamic overshoot in the cushioned seat back. Further slowing of the rate of onset of acceleration will occur from deformation of the very thin aluminium sheet pan riveted into the seat back - a process of energy attenuation. Thus, a rearwards facing seat will help avoid the peak jolt from torso dynamic overshoot. In addition, a rearwards facing seat will allow application of the \(-G_x\) acceleration force to be spread over the entire back, hips and head of the passenger, rather than concentrating the force across the pelvis via the lap restraint. The stress induced on the human body is thus significantly less (as stress is proportional to the force applied and inversely proportional to the area of application i.e. stress = force/area Nm\(^{-2}\)).

In summary, tolerance to whole body acceleration is better in a rearward facing seat (with the exception of a forward facing seat incorporating head, 4-point torso and leg restraints - this seating attitude affords the same acceleration tolerances as a simple rearwards facing seat with lap belt).

**Modifying factors to human tolerance**

**Seat stroking**

Seat stroking is the means by which jolt-onset acceleration forces are decreased, permitting greater tolerance to injury. Forward and rearward facing seats...
**Rearward facing seats**

have no significant differences in stroking performance during +G\(_z\) acceleration. During -G\(_x\) acceleration the forward facing seat affords no stroking protection from the back rest (excluding rebound phenomena) and inadequate stroke protection in high G accidents when the torso rotates onto the femurs – usually resulting in bilateral femoral fractures caused by bending injury. The bending injury occurs at the fulcrum point of the front seat spar\(^1^2\).

Rearward facing seats slow the *rate* of acceleration onset, and hence decrease jolt. This is performed by the seat back closed-cell foam compression, and deformation of the aluminium seat back infill.

**Seat collapse**

Seat collapse, especially collapse of the seat back, is much more likely to occur in a rearward facing seat due to the very high turning moment exerted upon it by the passenger. The seat back needs to be exceptionally robust to withstand this force.

**Tolerance to short duration acceleration**

**Comparison of +G\(_x\) to -G\(_x\)**

The majority of short and intermediate-duration acceleration studies conducted on humans have occurred with -G\(_x\) and +G\(_z\) forces applied to the upright-seated and forward-facing individual\(^1^9\). The physiological responses to -G\(_x\) as opposed to +G\(_x\) forces are little known, however with the major vascular structures lying posteriorly and adjacent to the vertebral column it would be hypothesised that a human could better withstand a -G\(_x\) acceleration if they were in a rearward facing seat.

Occupants of forward facing seats can withstand large forces applied in the +G\(_x\) axis as there is a larger supported area (the torso). Force vectors in the -G\(_x\) axis are also well tolerated *provided* there is full restraint. In aircraft accidents there are very large -G\(_x\).
Rearward facing seats

forces. By using rearward facing seats these forces can be spread over a large area.

<table>
<thead>
<tr>
<th>Seat direction</th>
<th>Jolt tolerance (velocity change dependent) feet/sec</th>
<th>Intermediate duration tolerance (pulse length dependent) G</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rearward facing (with head rest)</td>
<td>80</td>
<td>40</td>
</tr>
<tr>
<td>Forward facing (head, 4-point torso and leg restraint)</td>
<td>80</td>
<td>40</td>
</tr>
<tr>
<td>Forward facing (4-point torso restraint)</td>
<td>30</td>
<td>20</td>
</tr>
<tr>
<td>Forward facing (2-point restraint – lap belt)</td>
<td>30</td>
<td>15</td>
</tr>
<tr>
<td>Sideways facing (4-point torso restraint)</td>
<td>15</td>
<td>8</td>
</tr>
</tbody>
</table>

Table 1. A comparison of jolt tolerance and intermediate duration G-tolerance in human subjects in rearward and forward facing seats. Various restraint devices were used. Sideways tolerances are included for comparison. Data sourced from Ernsting, Nicholson, Rainford. Aviation Medicine 4th edition. Hodder Arnold 2006. Figure 10.4 page 173.

Comparison of ±G_x to ±G_z

Acceleration in the ±G_z axis places high stresses on the suspended organs, and is less well tolerated than ±G_x forces\(^7\). Occupants of rearward and (forward) facing seats that are fully reclined for sleeping are particularly at risk for shear injuries to organs and vascular structures during a large –G_x acceleration, provided their restraints hold them in-situ. It is more likely the occupant will submerge under the restraints and sustain severe axial load injuries. Rearwards facing sleeper beds are enjoying a return to service in new aircraft.

Comparison of ±G_x to ±G_y

Human tolerance to ±G_y accelerations is poorly tolerated. An hypothesized explanation for this would be that the human skeletal frame is much more strongly supported by flexor and extensor muscles than by lateral flexors. The human spine would be the best example of this. Accelerations in the ±G_x axis are much better tolerated\(^7\).
Rearward facing seats

appropriately high backrest is present. Hyperflexion injuries to the cervical spine occur with forward facing seats.

Restraint injuries
Restraint injuries are much less frequently encountered with rearward facing seats. They are more prominent if there is an element of $\pm G_y$ acceleration. Forward facing seats are most commonly provided with a two-point harness. The force of the accelerating body mass is held by the restraint leading to high stress forces across the pelvis. Although relatively strong, this concentration of stress can lead to pelvic fracture and disarticulation. In addition there are large pressure forces exerted on the intra-abdominal organs causing burst injuries to the spleen and liver, as well as perforations of hollow organs and vascular injury. The forward facing seat with basic lap belt is also associated with a high incidence of lumbar vertebral fractures, femoral fractures and major head injury.

Injuries from aircraft structures and loose debris
Rearward facing seats significantly expose the occupant to secondary injuries from the missile effect of loose cabin objects, as well as head and chest injuries from loosened overhead lockers. It is usual for the majority of overhead locker bins to tear free in an aircraft accident$^{9,10}$.

Rearward facing seats and motion sickness
Rearward facing seats are reported as increasing susceptibility to motion sickness, however there are no studies that validate this assertion$^4$.

Rearward facing seats and illusions
On takeoff (and to a lesser extent upon landing) there is a false sensation of body tilt whereby a non-vertical gravitoinertial force is perceived as vertical$^{20}$. This is known as a somatogravic illusion. Upon horizontal acceleration for takeoff the rearward facing passenger will perceive they are being pitched aft-wards. At rotation this perception is compounded by the real vertical acceleration. The illusion is ameliorated by maintaining visual cues (i.e. by looking out the window). The somatogravic illusion may be accompanied by the oculogravic illusion.

Rearward facing seats - passenger attitudes
There is a general perception that passengers have an aversion to rearward facing seats in aircraft. Some authors have asserted that passengers do not like being (relatively) pitch down at take-off$^4$. In darkness or with the absence of visual cues from the external environment, this aversion may be compounded by the somatogravic illusion.

Summary of advantages and disadvantages of rearward facing seats

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased crash survivability</td>
<td>Increased seat weight</td>
</tr>
<tr>
<td>Only requires simple restraints</td>
<td>Increased unit cost</td>
</tr>
<tr>
<td>80 feet/sec jolt tolerance</td>
<td>Increased air ticket costs</td>
</tr>
<tr>
<td>40G tolerance</td>
<td>Disliked by passengers</td>
</tr>
<tr>
<td>Fewer restraint injuries</td>
<td>Somatogravic illusion</td>
</tr>
<tr>
<td></td>
<td>Pitch aft on take-off</td>
</tr>
<tr>
<td></td>
<td>Possible Increased motion sickness</td>
</tr>
<tr>
<td></td>
<td>Increased risk of missile injury</td>
</tr>
</tbody>
</table>

Table 2. A comparison of the advantages and disadvantages of rearward facing seats
Conclusion

Despite the evidence that rearward facing seats confer increased crash survivability they remain little used in general aviation. Rearward facing seats require significantly different engineering requirements. Concomitant with this will be increased weight and costs. In addition, most passengers are reluctant to “face backwards” when being transported.

Any decision to implement widespread use of rearward facing seats would most likely require legislation on behalf of civil aviation authorities worldwide. Unless this occurs the current status quo will remain.

Disclaimer
The views, opinions, and/or findings in this report are those of the author and should not be construed as an official policy of the Royal Australian Air Force or the Australian Defence Force.

References

Sir Ross Smith K.B.E., M.C., D.F.C., A.F.C.

Judith Rischbeith

ROSS (b.1892) and KEITH (b.1890) were two of the four children born to Andrew Smith, manager of a pastoral property, Mutooroo Station, south-west of Broken Hill. The boys were skilled riders and knowledge of bushcraft came naturally to them.

In 1902 Keith and Ross were sent as boarders to Queen’s School in North Adelaide. Mr Hood, Headmaster, damned them with faint praise saying that they were “unassuming boys who would never set the Thames on fire”, despite the fact that Ross was the junior and senior athletics champion and captain of cricket and football.

After leaving school Ross was employed as a warehouseman by Harris Scarfe.

World War 1

At the outbreak of war in August 1914, Ross enlisted in the 3rd Lighthorse and sailed in the first convoy to leave Australia, disembarking at Cairo. In May 1915 his regiment was sent to Gallipoli as a reinforcement for the troops already there. His letters from Gallipoli were cheerful, describing the camaraderie of the troops and the pleasures of sea bathing. The reality was very different. The Australians were sitting ducks for Turkish snipers and casualties were high.

Ross displayed courage and leadership and was promoted 2nd lieutenant, aged 23. He became seriously ill with enteric fever and was invalided to England after four months on Gallipoli. After recovering, he was recalled to his regiment and returned to horse-borne desert patrols in Egypt.

The Turks, encouraged by the allied withdrawal from Gallipoli, were advancing on the Suez Canal. The Australians under General Sir Harry Chauvel routed the Turks at Romani, where Ross Smith fought with distinction and was subsequently promoted 1st lieutenant.

In October 1916, Ross joined 1 Squadron of the Australian Flying Corps, then recently formed in Egypt. He was an observer for about six months, after which he qualified as a pilot and was promoted captain before returning to his squadron on 29 November 1917. His subsequent war record presents the story of a fearless pilot devoted to serving his country. Citations for his military awards confirm this.

Awards and Honours

Military Cross 11 May 1917

For conspicuous gallantry and devotion to duty when his pilot descended to rescue an officer who had been forced to land. On landing, he held the enemy at bay with his revolver, thus enabling his pilot to rescue the officer and to fly safely away with his machine.

Bar to Military Cross 26 March 1918

For conspicuous gallantry and devotion to duty. He was one of two pilots who carried out a remarkable series of photographs in one flight, covering an area of 45 square miles. On a later occasion, he successfully bombed an important bridge-head from a low altitude, and his work throughout, as well as photography, has been invaluable and characterized by the most consistent gallantry.

The British advance on Jerusalem was held up by mountainous country. Their maps were useless so the RFC was ordered to prepare an up-to-date set. Ross Smith and Lieutenant Austin photographed the whole area between the British forces and the Holy City.

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Abstract

This article is a tribute to Sir Ross Smith. The author developed an interest in the life of Sir Ross Smith as her mother received one of the 200 letters postmarked in England and carried on the first flight from England to Australia. This letter has been donated to the South Australian State Library.

Judith Rischbeith recounts the extraordinary fearless life of Sir Ross Smith, evident in the citations of the honours and awards conferred upon him during World War 1. She recounts the remarkable first flight from England to Australia in 1919 by Ross and Keith Smith, with their two mechanics, James Bennett and Walter Shiers.

Sir Ross Smith and Jim Bennett were tragically killed in an aircraft accident in 1922 during preparation for an around the world flight. A magnificent legacy remains to fund advancement of the science of aeronautics in South Australia.
Distinguished Flying Cross  8 February 1919

During the month of June, 1918, these officers (Captain Smith and Lieutenant A. Kirk, D.F.C.) accounted for two enemy machines, and they have been conspicuous for gallantry, and initiative in attacking ground targets, frequently at low altitudes. The keenness and fine example set by these officers cannot be over-estimated.

Bar to Distinguished Flying Cross  
8 February 1919

During the operations prior to October, 1918, he took part in numerous engagements involving flights of 150 to 200 miles, and succeeded in doing extensive damage to the enemy’s hangars, railways, etc. Captain Smith displayed most consistent gallantry with marked ability in all his work, whether bombing by night or day, or in personal encounters in the air. While operating with the Sherifflian forces, he destroyed one enemy machine and brought down two others out of control in the desert.

Second Bar to Distinguished Flying Cross  
8 February 1919

On 19 October 1918, this officer, with Lieutenant Ashley Vernon McCann as observer, engaged and drove down an enemy two-seater. As it appeared to land intact, he descended to a low altitude and, with machine-gun fire, forced the occupants to abandon the machine; he then landed alongside it and whilst his observer covered the enemy officers, he set light to their machine and completely destroyed it. To have affected a landing in an unknown country, many miles in the rear of the enemy’s defence troops, demanded courage and skill of a very high order.

Air Force Cross

This officer accompanied Major-General Sir W.G.H. Salmond on an aerial journey from Cairo to Calcutta – a trip of 2,548 miles, in a machine that had previously flown from London to Cairo.

Order of el Nahda

This special order was awarded by the King of Hejaz for conspicuous gallantry and devotion to duty. (Ross Smith was personal pilot for Lawrence of Arabia).

After World War  1

After the armistice in 1918, General Borton asked Ross if he and his mechanics, Lts. James Bennett and Walter Shiers would fly with him from Cairo to Baghdad and thence pioneer a route to India.

“There” said Borton “we can see the Viceroy’s Cup run in Calcutta.”

“And after that”, said Ross, “Let’s fly to Australia and see the Melbourne Cup.”

That flight was successful and uneventful. They were entertained in India by British dignitaries and maharajahs and did get to see the Viceroy’s Cup.

Later the Air Ministry directed Borton to charter a boat and sail down the coasts of Burma, Siam, Malaya, Singapore and the Dutch East Indies seeking sites for airfields for commercial air links to the Far East and Australia. He asked Ross to join him.

The first charter boat mysteriously exploded and Ross lost all his possessions. The project continued with another boat. Borton and Ross journeyed as far as East Timor, making valuable contacts for fuel supplies and determining possible landing sites.
First Flight from England to Australia

On returning to India, they read in an Australian newspaper that the Australian Government had offered a prize of £10,000 for the first Australian crew to fly from England to Australia within thirty days.

With help from General Borton and the Air Ministry, Ross, Bennett and Shiers were on the first troopship to England, intent on entering the great race. Back in England there was no time to lose, as there were already six entrants in the race. Ross’s brother, Keith, awaiting repatriation to Australia, joined the crew as co-pilot and navigator. Because of Ross’s reputation as a pilot, Vickers Ltd agreed to supply them with a Vickers Vimy bomber, powered by two Rolls Royce engines.

Thereafter the four men practically lived at the Vickers factory, making adjustments to the ‘plane and preparing for the flight. Ross’s experience and the contacts made with General Borton were valuable for planning the journey east of India.

All-up weight was a vital limitation. There could be no heavy radio equipment – only maps, compass and Keith’s and Ross’s navigational skills.

To quote Grenfell Price: “When the final weighing-in showed an excess of 300lbs, something had to go. Petrol and spare parts being essential, the only economies that could be made were in personal kit. In spite of the distance to be flown and the variety of weather conditions to be faced, the party dispensed with all their personal kit and left England with the garments they wore and the proverbial toothbrush.”

One inessential item carried was a mail bag containing about 200 letters post-marked in England.

On 11 November 1919, in spite of forecast bad weather, they flew from Weybridge to Hounslow airport ready for an early start on November 12. Here the Royal Aero Club officially marked the Vickers Vimy as a contestant in the race and the wings were painted with their identity letters G-E AOU, officially marked which the crew interpreted as “God ‘Elp All Of Us”.

From start to finish, their greatest enemy was the weather – bitter cold, torrential rain, and searing heat in Australia.

The cruellest day was 12 November, the day they set off for Lyons in France. Once they left England and flew over the Channel they were in thick clouds and snow storms. Four men, in open cockpits, exposed to the elements, their goggles clouded with snow. For three hours they had no glimpse of earth and navigated solely by compass, their bodies racked with cold. Even the reviving sandwiches they had brought were frozen stiff. Their only comfort was the steady throb of the Rolls Royce engines. Then a great gulf appeared between the clouds ahead. Ross wrote lyrically about it: “At the bottom lay the world. As far as they eye could reach; in every direction stretched the illimitable cloud sea, and the only break lay now beneath us. It resembled a tremendous crater, with sides clean-cut as a shaft. Down this wonderful cloud avenue I headed the Vimy, slowly descending in a wide spiral. The escape through this marvellous gateway, seven thousand feet deep, that seemed to link the realms of the infinite with the lower world of the mortals, was the most soul-stirring episode of the whole voyage.”

They finally landed, stiff with cold, at Lyons where they spent the first night. They had great difficulty in communicating with the French, who thought the Australian aviators insane to fly in such weather and were unco-operative in providing refuelling.

Several days later on landing at Pisa, the Italians could not have been more helpful and were apologetic that the airport was covered in water after heavy rains. It continued to rain throughout the night. The next morning the airport was a lake and the Vimy bogged. However, with the help of some thirty excitable Italians, she was dislodged.

There was a danger of the Vimy nose-diving if it could not accelerate sufficiently before take-off, so Shiers tied a rope around Bennett’s waist while he weighed down the tail of the plane as it taxied. Bennett was instructed to take the first train to Rome and meet them there the next day, but Shiers managed to haul him aboard and they took off safely.

The next flight leg took them across the Mediterranean to North Africa, where Ross was in familiar territory. Their next emergency came just before reaching Cairo when the engine was running hot. On landing at Heliopolis, they discovered a cracked induction pipe. As no spares were available, Keith suggested using chewing gum to seal it. They all chewed vigorously on Wrigley’s Spearmint®, Bennett flattened it and effected a satisfactory seal on the pipe which he then wound with ignition tape and sealed with shellac – and they continued to Cairo. Ross wrote of their arrival: “There was some excuse for a flash of thankfulness and exultation. Then the boys were greeting us, and a rousing welcome it was from men with whom I’d served during the war. Our mechanics, too, found old comrades who hauled them off to celebrate the occasion.”
Such interludes were few and far between during the flight.

“There was always plenty of work to be done at the end of each day flying. Both of the engines had to be overhauled and cleaned, all parts of the machine examined and petrol and oil tanks filled for the next journey. Usually this took us 3 or 4 hours every day. We adopted a set program which we always carried out religiously. As soon as the machine landed Bennett and Shiers would don their overalls and set to work on the engines; the sparking plugs would be taken out and cleaned, magneto examined and all parts of the engine inspected and cleaned. On this work to a large extent depended our success or failure.”

“By the time I returned to the machine Keith would have the petrol ready to put into the tanks and we would start to work. This was very tiring and monotonous. I would open the 4 gallon cans and lift them up to my brother, a distance of about 6 feet, and he would empty the cans into the tanks through a large funnel with a chamois leather strainer. Usually we lifted and filtered about a half a ton of petrol into the machine and sometimes as much as a ton if we had just completed a long flight. I have always regarded this work as the hardest part of the whole flight. We would land more or less tired after several hours in the air and then start on really hard work again. The temptation was always to let someone else do it and go off ourselves and rest, but other people might not have filtered the petrol properly, or done something wrong. We decided before we started that we would do all the work on the machine ourselves and as far as possible we carried this out.

By the time the tanks were full Bennett and Shiers would have the engines finished; we would then fill up the oil tanks with Castrol®, put the covers over the cockpit, and peg the machine down for the night.”

On arrival in Delhi, they decided to treat themselves to a leisure day.

“As I had been to Delhi during my flight to Calcutta with General Horton, I played the guide and an enjoyable ramble through this future capital diverted our thoughts from the Vimy for the moment and enabled us to relax.”

The route from Singapore to Darwin was by far the most hazardous because of the uncertainty of the landing grounds. A landing ground had been prepared at Singora, but tree stumps, some a foot to eighteen inches high, were left. By a miracle they landed with only minor damage. The next day the Governor of Singapore sent 200 prisoners to clear the stumps from a central strip to allow a safe take-off.

Next they flew to the Dutch East Indies where they were given much support and hospitality and the good news that several landing grounds had been prepared between Java and Australia. Their optimism was ill-founded. On arriving at Surabaya after monsoonal rains, the Vimy became hopelessly bogged in soft mud. Despite efforts of hundreds of coolies, it could not be moved. Keith saved the day again, suggesting that strips of bamboo matting could be laid to make a runway. Next morning saw hundreds of natives arrive with bamboo matting from their houses to cover the mud. As Keith wrote1 “We just got off, matting flying in all directions, but no damage done.” (The Vimy, being the first plane to be seen in Surabaya, the whole population was involved in the excitement).

The last island stop before Australia was Atamboea in Timor. Here they drank a toast in coconut milk before tackling the 5 hour journey across the Timor Sea.

Ross wrote1: “If an aeroplane is forced to land in the sea it usually floats for a time, then the forward part sinks and only the tail remains above the water. Remembering this, just before leaving Timor we tied a parcel of food, a bottle of water, the Very pistol and some cartridges onto the tail so that we would have something to fall back upon in the case of an emergency.”

Our watches registered 11.48 when Keith nodded ahead, and dead on the line of flight we made out a faint smoke that soon resolved itself into the smoke plume of a fighting ship. It was the HMAS Sydney, and we knew now that, whatever might befall, we had a friend at hand.

At 1.30pm we sighted the Bathurst Island lighthouse and at 3pm reached Darwin, landing at Fanny Bay. We landed on Terra Australis on December 10th, 27 days 20 hours after taking off from Hounslow. We had won the race against time with 52 hours to spare. It was and will be the supreme moment in our lives.”

K.B.E.

He was created Knight Commander of the Most Excellent Order of the British Empire on 22 December 1919 on completing the first flight from England to Australia. This was announced when his Vickers Vimy aircraft reached Longreach, Queensland, en route to Melbourne.

Next day the telegrams of congratulations flooded in from all over the world. Both Keith and Ross received

Sir Ross Smith KBE MC DFC AFC
Sir Ross Smith KBE MC DFC AFC

knighthoods and Bennett and Shiers were promoted Lieutenants and awarded Air Force Medals.

“It was a team effort,” Ross wrote¹, “Each man knew exactly what he had to do and did it and never once was there a misunderstanding or cross word spoken amongst our four selves.”

Ironically the Australian leg of the trip was very difficult. The summer heat was intense and limited the number of hours they could fly. Furthermore, the Vimy was showing serious signs of fatigue. In Charleville they took on board Captain Frank Hurley of Antarctic fame, who joined them for the rest of the flight taking many aerial photographs.

They finally arrived in Melbourne where the Prime Minister Billy Hughes handed Ross a cheque for £10,000, which was divided equally among the four men.

The last and most joyous leg was their return to Adelaide, where they landed in paddocks by the North-East Road to be met by family members and crowds of friends and admirers.

The fatal accident

Over the next two years, Ross and Keith gave many lectures in Australia and overseas about the flight. They were then offered another challenge.

Vickers, whose planes held the record of the first flight across the Atlantic as well as the England – Australia flight, invited the Smith brothers with Bennett and Shiers to tackle an around-the-world flight in an amphibian aircraft.

By April 1922, preparations were complete and the pilots were about to take a test flight at Brooklands airfield. Keith was delayed leaving London, so Ross and Bennett decided to fly without him. Keith arrived at the airfield to see the ‘plane already in the air and witnessed the tragic nose-dive which killed Ross Smith and Jim Bennett.

Keith returned to Australia with their embalmed bodies. Bennett’s body lay in state in the Queen’s Hall in Parliament House, Melbourne before being buried in St Kilda. Ross’s catafalque was in St. Peter’s Cathedral, Adelaide, where thousands came to pay tribute to a great Australian. He was laid to rest with military honours in a simple grave at the North Road cemetery.

Keith continued his interest in aviation in Australia where he was the representative for Vickers Aircraft Company. He was also vice-chairman of British Commonwealth Pacific Airlines and a director of Qantas and Tasman Airways. He lived in Sydney with his wife, Anita. After Keith died in 1955, Anita returned to Adelaide where she lived until her death in 1986.

Legacy

They had no children but they left a magnificent legacy. Lady Smith bequeathed her estate which amounted to several million dollars to the establishment of the Sir Ross and Sir Keith Smith fund and directed that the income from the fund be applied in perpetuity for the advancement of the science of aeronautics in the State of South Australia. To date, grants of over $4,000,000 have been made for graduate and post-graduate scholarships and for the promotion of aeronautical research and aircraft safety.

In the field of aviation, to the average Australian, the name 'Smith' evokes the memory of Sir Charles Kingsford-Smith, or 'Smithy' as he was popularly known. Kingsford-Smith was a Queenslander and Sydney airport bears his name. He too was a great Australian aviator who, with Charles Ulm and two others, were the first to cross the Pacific in three days in 1928. Their plane, the Southern Cross, had wireless communication and was more technically advanced than the Vickers Vimy.

South Australians honour the memory of their Smiths, Ross and Keith. The 27 days odyssey of the Vimy brought world acclaim to its crew. Their achievement was an event of great importance in the post-war gloom and led to the expansion of aviation as a means of transport and communication.

Ross was the inspiration and leader of that first flight. With his record of bravery in World War I and his contribution to aviation, this great South Australian can not be allowed to be forgotten. The London Daily Telegraph wrote in a tribute to him: “If ever a human being followed the maxim LIVE DANGEROUSLY, it was this gallant Australian.”

References

1. Ross Smith, 14,000 Miles Through the Air (Lond, 1922)
2. Sir A. Grenfell Price. The Skies Remember, Sydney, 1969
Adelaide Airport’s Smith Brothers walking trail

Members of the Walkerville Historical Society were among guests who joined in the celebrations to launch the “Smith Brothers Walking Trail” on Sunday 12th February 2006.

The trail plaques describe each stage of the 1919 epic flight by Ross Smith, Keith Smith, Walter Spiers and James Bennett on their twenty seven-day journey in the Vickers Vimy aircraft from England to Darwin.

Both Ross and Keith Smith were South Australians who lived in Walkerville.

The trail begins at the new airport and will ensure that the Vickers Vimy Building and the significance of what it represents retain prominence in Australian aviation history.

Led by Walkerville residents Judith Rischbieth and Betty Lewis, a drive for funds resulted in the necessary money being raised. The donors included the Mutooroo Pastoral Co. and several Walkerville residents.

At the opening ceremony which was officially opened by Hon. Jane Lomax Smith, were relatives of Mrs Andrew Smith (the brothers’ mother).

Reprinted courtesy of Walkerville News

Statue by John Dowie at Adelaide Airport of Ross Smith, Keith Smith, Walter Spiers and James Bennett.
Aeromedical Certification of Thin Melanomas in Australia

Heather M. Parker¹, OAM BA MD FRACGP
Bert Pruim², MBBS MMedSc FACD

THE DESIGNATED AVIATION MEDICAL EXAMINER’S (DAME) handbook contains guidelines which state with reference to malignant melanoma:

“For aeromedical certification following the diagnosis of malignant melanoma, CASA will not certificate the pilot or air traffic controller for a period of 12 months because of the risk of spread to organs such as the brain, lungs or bone. The associated risk of incapacitation, says the guide, is significant.

Certification will then be for no more than 12 months and renewal medical examination and report must be accompanied by a progress report from the treating dermatologist or oncologist for a period of three years.”

Case Presentations

Pilot 1
The first pilot underwent a Class 2 medical examination in 1996 which was upgraded to Class 1 in 1998. He was then aged 24. In the interim period in January 1997 he had a Level 2 malignant melanoma excised from his back by his general practitioner, maximum thickness 0.45 mm. In February of that year he underwent a wider excision by a surgeon and the pathologist found, as is often the case, no evidence of melanoma in the wider excised specimen.

The pilot subsequently obtained employment in Papua New Guinea and in Weipa in the Northern Territory. He undertook his CASA aviation medical examination annually over the next seven years. Pilots living in remote parts of Australia find it very difficult to get a convenient appointment with a specialist. As a result, the subject pilot coordinated his specialist review appointments with his CASA DAME assessments while he was on the Sunshine Coast for one week each year. Despite a number of letters to the Office of Aviation Medicine explaining the situation and asking if he still had to see specialists for review, CASA was firm in its requirement for the pilot to be reviewed annually by a specialist. The pilot was last reviewed by a dermatologist in 2002, some five years after the Level 2, 0.45 mm melanoma was diagnosed. The dermatologist’s letter reads:

“Thank you for referring this man back for review. I checked his skin generally and could not detect any lesion requiring any intervention at this stage.”

The aeromedical disposition determined at five years after diagnosis was that he was no longer required to see a specialist and the restriction “Renew by CASA only” was removed from his medical certificate.

Pilot 2
The second pilot underwent his annual Class 1 aviation medical examination in January 2005 when he was 33 years of age. In the history section of the report, he answered the question about skin cancer in the affirmative. After extensive questioning, it became evident that the pilot was completely unaware of the diagnosis and he had continued to fly over the past year, which in point of fact was fortunate for him because the year he was supposed not to be flying had passed. Further investigation revealed that In January 2004 the pilot had a Level 2 melanoma excised from his right shoulder, maximum thickness 0.39 mm. He had a wider excision by a dermatologist the following month and no evidence of residual melanoma was found, with clear surgical margins. The dermatologist wrote:

“The pilot showed me printouts from the CASA website. I must say the issue of recertification within the first year of diagnosis is both news to me and...
somewhat unclear from this document. The Medical Examiner’s Handbook does seem unnecessarily harsh in this situation…”

“Firstly I did try to provide an estimation of risk of even partially disabling disease from metastatic melanoma. When one works with the total risk of either mortality, or more appropriately of secondaries and then tries to approximate the proportion of such disease load that would be disabling and then tries to work out the time for emergence of such disability, one does end up with (what he calls) astronomically low probabilities.”

He continues: “Secondly recommendations have been made from the International Cancer authorities for the rearrangement of staging classifications for malignant melanoma which will no longer be based on the .76 mm/2.5 mm/3 mm Breslow intervals, but rather on 1 mm intervals and TNM classification. The Examiner’s Handbook will become increasingly out of step with melanoma literature.

“Thirdly recently published research on melanoma suggests that if the Lymphatic Vessel Growth Factor – VEGF-Alpha cannot be demonstrated in the sentinel nodes, the tumour does not have the capacity to metastasize. This test may be done on fresh tissue either sentinel node or primary, which might reliably predict whether or not a tumour has the capacity to metastasize.”

The aeromedical disposition in the above case was CASA required a progress report from a treating dermatologist in 12 months and applied a “Renew by CASA only” restriction.

Pilot 3
A 38 year old Class 1 pilot had a Level 2 amelanocytic melanoma excised from the right wrist in June 2005 with a maximum thickness of 0.55 mm. This was re-excised by a dermatologist and no evidence of residual melanoma was found in the excised specimen.

The histology report commented that “the lines of the excision are well clear, some melanocytic hyperplasia adjacent to the biopsy wound.”

The dermatologist comments: “This is a 38 year old man I have recently excised a Level 2- 0.55 mm thick melanoma with definitive margins from the right wrist. I note that in the context of his pilot medical restrictions potentially arise in certification for those with a recent diagnosis of melanoma. I must reiterate that the most accurate estimate of this man’s prognosis resulting from this melanoma is that he has a 98% ten-year survival related to this tumour. In those circumstances where melanoma or metastases do occur it is unpredictable when such metastases occur; they commonly occur many years after the initial diagnosis. When such recurrences or metastases occur they tend not to present with acute symptoms that one might reasonably expect would interfere with flying, as opposed to, for example, cerebro-vascular accidents.

“I agree with you that current recommendations in the Medical Examiner’s handbook of CASA may have expectations both in terms of unnecessarily restricting certification on the vast majority of pilots who suffer from malignant melanoma as well as in terms of potentially missing a large proportion of those pilots who subsequently go on to develop metastases.”

These comments refer only to “thin” melanomas, that is Level 1 and 2.

Correspondence was sent to the Office of Aviation Medicine in CASA in July 2005 about this pilot with the comment that, given this histology, the risk of an incapacitating event as a result of this diagnosis would be zero. Accordingly, it was requested that the guideline in the DAME Handbook of one year’s exclusion from flying should be waived in this instance.

The aeromedical disposition in this case as of September 2005 was Fit for Class 1 certification for 12 months with “Renew by CASA only” restriction. His next medical was due in November 2005 with a requirement for a report from his treating specialist with regards to his malignant melanoma.

Other Aviation Authorities
The policies of other aviation regulatory authorities was reviewed with respect to aeromedical certification of pilots with malignant melanoma and is summarised as follows.

Joint Aviation Authority (JAA – UK and Europe)
Early thin lesions are cured by surgery. Treatment is surgical usually by wide excision and grafting if necessary. Provided the biopsy shows a wide, clear excision there is usually no need to assess as temporarily unfit the Aircrew for more time than it takes the excision or graft wound to heal. The decision about recertification will be made by AMS.

Federal Aviation Authority (FAA-USA)
Melanomas are disqualifying for flying. The length of disqualification depends on the depth and stage of the melanoma. Pilots with melanoma may have their
Aeromedical Certification of Thin Melanomas

cases reviewed by the FAA for return to flying as soon as treatment is complete.

New Zealand: (personal correspondence)
Melanoma is not specifically mentioned in the Handbook “We tend to follow the JAR paradigm which relies mainly on the Breslow thickness rather than the Clark level. For malignant melanoma up to about 1.4 mm, Class 1 are certified multi-crew for the first 12 months, under JAA regulations. In each case we want to see the full histology and treatment reports, Clark level, growth phase, melanoma-in-situ, sentinel node biopsy etc may modulate our conclusion on a case-by-case basis.”

South Africa
The South African authorities require an oncology report, pathology including clinical staging to include maximum thickness, Clark level, excision margins, any radiology reports, chest X-ray, CT scan abdomen, CT scan of brain and blood tests including FBC, ESR, LFTs (LDH, Alk phos, SGOT, SGPT).

Transport Canada (personal communication)
There is nothing in the Canadian AME handbook specifically referring to malignant melanomas, since they are all treated on a case-by-case basis. Despite the lack of evidence for a full work-up investigation for thin Clark’s Level 1 tumours, Transport Canada would expect to have all melanoma pilots undergo Chest X-Ray, blood work and provide an oncologist’s report.

Those tumours that are small and show no sign of invasion or metastases can be certified with annual follow-up reports. Any invasion or metastasis would be made unfit. Those with equivocal results are referred to the Board oncologist for opinion.

Discussion

The above cases are presented to illustrate the inconsistency in aeromedical disposition of thin melanomas by CASA and to present a case for changing the guidelines that at present suggest a one year grounding for the diagnosis of any malignant melanoma. To follow is an opinion by a dermatologist with recommendations for change in the guidelines for DAMEs from CASA.

Dermatologist Comment

This is a brief comment on the clinical relevance of the current CASA DAME handbook guidelines in the management of those with a recent history of malignant melanoma (Tables 1 and 2). The DAME handbook states: ‘Certification will be for no more than 12 months, and renewal medical examinations and reports must be accompanied by a progress report from the treating dermatologist or oncologist. These reports will be required for at least 3 years following return to unrestricted duties’. The adequacy of the guidelines in appropriately limiting certification of pilots at high risk from melanoma-related incapacitating events will be questioned.

How common is melanoma?
Cutaneous melanoma is the fourth most common cancer in Australia (excluding basal and squamous cell carcinoma). It is the most common cancer in men aged 25-54 and in women aged 15-29. It is therefore the commonest cancer of young people, the age demographic of pilots. Each year, approximately 8,500 Australians are diagnosed with malignant melanoma and 1000 Australians die of melanoma. Almost half of all melanomas are diagnosed in people less than 60 years of age. The current lifetime risk for melanoma is 1 in 25 for men and 1 in 34 for women.

<table>
<thead>
<tr>
<th>Tumour thickness</th>
<th>Certification</th>
<th>Period post-diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 0.76 mm</td>
<td>Solo</td>
<td>12 months</td>
</tr>
<tr>
<td>0.76-1.49 mm</td>
<td>Solo</td>
<td>24 months</td>
</tr>
<tr>
<td>1.5 – 2.24 mm</td>
<td>Solo</td>
<td>36 months</td>
</tr>
<tr>
<td>2.25 – 3.0 mm</td>
<td>Multicrew</td>
<td>24 months</td>
</tr>
<tr>
<td>&gt; 3.0 mm</td>
<td>Multicrew</td>
<td>48 months</td>
</tr>
<tr>
<td></td>
<td>Solo</td>
<td>60 months</td>
</tr>
</tbody>
</table>

Table 1. Post-malignant melanoma certification (Class 1 and 3). Source DAME Handbook

<table>
<thead>
<tr>
<th>Tumour thickness</th>
<th>Certification</th>
<th>Period post-diagnosis</th>
</tr>
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<tbody>
<tr>
<td>&lt; 0.76 mm</td>
<td>Solo</td>
<td>12 months</td>
</tr>
<tr>
<td>0.76-1.49 mm</td>
<td>Solo</td>
<td>12 months</td>
</tr>
<tr>
<td>1.5 – 2.24 mm</td>
<td>Solo</td>
<td>12 months</td>
</tr>
<tr>
<td>2.25 – 3.0 mm</td>
<td>As or with co-pilot</td>
<td>12 months</td>
</tr>
<tr>
<td>&gt; 3.0 mm</td>
<td>As or with co-pilot</td>
<td>24 months</td>
</tr>
<tr>
<td></td>
<td>Solo</td>
<td>36 months</td>
</tr>
</tbody>
</table>

Table 2. Post-malignant melanoma certification (Class 2). Source DAME Handbook
**Aeromedical Certification of Thin Melanomas**

**Prognosis**

The principal prognostic indicator for survival from melanoma is lesion thickness (Table 3). More than half of lesions diagnosed in Australia are less than 1 mm thick. Fewer than ten percent of melanomas have spread to lymph nodes at the time of diagnosis. Five year survival rate for all melanomas is 90 percent. Early diagnosis and surgical treatment is the key to improving prognosis. There is currently no treatment that clearly affects melanoma prognosis other than early diagnosis and definitive surgical treatment.

<table>
<thead>
<tr>
<th>Tumour thickness</th>
<th>5-Year Survival (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 0.76 mm</td>
<td>98-100</td>
</tr>
<tr>
<td>0.76-1.49 mm</td>
<td>90-94</td>
</tr>
<tr>
<td>1.5 – 2.24 mm</td>
<td>83-84</td>
</tr>
<tr>
<td>2.25 – 3.0 mm</td>
<td>72-77</td>
</tr>
<tr>
<td>&gt; 3.0 mm</td>
<td>46</td>
</tr>
</tbody>
</table>

Table 3. Five-year survival for malignant melanoma

Regardless of the thickness of the melanoma at the time of diagnosis, survival curves continue to slope gradually down to 10 years and beyond (Figure 1). CASA guidelines currently suggest termination of melanoma follow-up five years post-diagnosis. Terminating follow up at five years will lead to a failure to diagnose a proportion of melanoma metastases.

**How common are acute incapacitating events in melanoma?**

DAME guidelines state that the risk of incapacitation associated with melanoma is ‘significant’.

A recent Pub-Med search revealed only 22 relevant references relating to acute incapacitating events in melanoma. Almost all these references were case reports. The acute events recorded in the setting of metastatic melanoma included acute bowel obstruction, acute liver failure & acute pancreatitis. Relatively fewer intra-cerebral events were reported. Crucially, there were no reports of metastatic melanoma presenting with an acute incapacitating event.

Only those who suffer from metastatic melanoma may potentially experience an acute incapacitating event. The majority of melanoma patients do not experience metastases. To experience a relevant acute incapacitating event if a patient has metastatic disease would be exceptionally unlikely.

**Should a review of the current CASA DAME Guidelines in relation to management of malignant melanoma be considered?**

The current DAME guidelines in relation to melanoma appear not to adequately address the following:

- By limiting the follow-up period to five years post-diagnosis, many at practical risk of metastatic disease in the longer term are potentially missed.
- By not recognizing the relatively better prognosis of those with very early/thin lesion, certification of many at very low risk of incapacitating events is unnecessarily limited.
- The risk of melanoma presenting as an acute event, however potentially important, is overstated.
- Primary cutaneous and primary non-cutaneous malignant melanoma, which have very different prognoses, are not adequately defined and separated.

I believe the guidelines warrant a review. Any review should ideally involve representatives from the relevant specialties including surgeons, dermatologists, medical oncologists as well as medical practitioners experienced with and representative of CASA and aviators.

**References**

The Presidents’ Logbook

By now most of you will have heard the news that was announced in the Autumn DAME Newsletter – that from July 2007 CASA plans to introduce a fee for the designation and redesignation of DAMEs. In the PMO’s column, Dr Ian Hosegood wrote: “Another change to the fee structures that will affect DAMEs is that from July 2007, CASA will also be required to recover its costs associated with administrative designations and delegations. As such, the costs associated with appointing and reappointing DAMEs will be recovered and the proposed fee is $130.”

The good news is that for the moment the introduction of this fee has been averted. Dr Hosegood has put a case to CASA management that such a fee would negatively impact on DAMEs and the medical certification system, and he has assured the Society that this fee will not be introduced in the coming financial year. However, it has not been taken off the agenda, and may still be imposed at a future time. Let’s not forget, this is an election year.

This is the same cost recovery philosophy that saw the introduction of the $130 fee for processing aviation medicals, which has recently been reduced to $75. We were strongly opposed to the introduction of that fee, and ASAM is certainly opposed to the introduction of a fee to designate DAMEs. DAMEs are performing a service on behalf of CASA and should not have to pay for the privilege. They have costs associated in setting up infrastructure to meet CASA’s requirements which they do not pass on to CASA, and time is spent outside the context of aircrew medicals on CASA administration and paperwork – all unpaid. It seems DAMEs may now be expected to pay not only for designation, but will also be expected to take on more responsibility in certification as CASA divests itself of processing Class 2 medicals – which seems will be the likely outcome of the review of the Class 2 licensing system.

My fear is that this move by CASA could act as a last straw phenomenon for many of our members who have had to put up with so much administrative inconvenience over the last few years. Particularly for those who do not perform large numbers of medicals, DAMEs could be excused for deciding that it is just all too hard. For most of us, aviation medicals are simply not core business, and while they allow many to indulge a shared passion for aviation, at the end of the day the cost-benefit balance my be toppled by the sheer weight of red tape, expense and nonsensical fees. The unfortunate consequence will be less DAMEs, particularly I suspect in remote areas, which will inevitably disadvantage our pilot patients.

Should such a fee be suggested again, the Society will be writing to the Minister for Transport and Regional Services and the Shadow Minister for Transport, expressing our strong objection to this very shortsighted policy. In that event, I would urge you all to do the same. Write or email CASA and the Minister expressing your concern in the strongest possible terms and detailing your intentions should this fee be introduced.

On happier matters, I am very excited about our annual Scientific Meeting in the Margaret River Region of Western Australia this year, which will be held at the Abbey Beach Resort from 6 – 9 September. Having visited the venue earlier this year, I can tell you that it will be a very relaxed beachside meeting at a venue that is very family friendly, so please make your holiday plans to coincide with the conference! I am also very pleased with the theme for this meeting “Something in the Air: Infectious Disease and Aviation”. This is perhaps a topic that doesn’t receive much attention, somewhat like Mental Health, so I believe that scientifically the meeting will be veryinteresting and professionally rewarding. Please register early for this meeting to take advantage of the early bird registration discounts. I would like to thank Dr Barney Cresswell and his entire local committee who are working so hard to put on what I am sure will be a fantastic meeting.

Our John Lane Trust Orator this year is Professor Charles Watson Executive Dean Curtin University, Division of Health Sciences. He is a public health physician and researcher in the fields of communicable disease and neurobiology and is currently a professorial research fellow at Curtin University. During his 11 years in the Health Department of Western Australia, he set up the Quit campaign, led the WA fight against HIV/AIDS, established breast cancer screening, and became a national leader in immunisation policy. As you may know, Professor Watson’s colleague, Professor Aileen Plant, who we had invited to be the John Lane Orator this year, passed away suddenly while traveling in Indonesia earlier this year. Our deepest sympathy is extended to Professor Plant’s family and all those who loved and respected her.

In 2008 we are heading to the tropics – Darwin in fact. As it happens, the Australian and New Zealand Society of Occupational Medicine (ANZSOM), is holding its 2008 conference in Darwin at the same time in August. At present we are in preliminary discussions with them regarding joint sessions as we share many common interests and in fact may well come up with a theme of interest to both societies. I
hope I can give you more information about this in future editions of JASAM and at the meeting in WA.

Don’t forget that at this year’s meeting we will be announcing a new committee for ASAM...yes hasn’t three years gone quickly! Nominations for the committee will close in July at a date to be confirmed, with the postal ballot being held in August. Please have your say, and also please of course make every effort to attend the AGM at Abbey Beach Resort in September. As I have not re-nominated for the President’s position, this will be my last JASAM column. I would like to thank every member of the Society who has given me such wonderful support over the last six years during a period of dramatic change and growth in the Society. I would also like to thank all the committee members I have worked with who have provided their time, wisdom, guidance, support, ideas, and boundless humour so that we could get the job done. I was just the guy that does the speeches – they are the ones who truly do all the hard work for this Society.

I look forward as usual to catching up with many of you in WA.

Gordon Cable
President, ASAM
Letters to the Editor

Who Regulates the Regulator?

To the Editor:

I would like to congratulate you for your succinct editorial, Who Regulates the Regulator? (Vol2 No2).

In my long association with CASA, commencing as a DAME with the then Department of Civil Aviation, I have not had problems associated with the submission of medical examination proformas of any substance till the past 1-2 years when absurd decisions, often made by clerks, across a spectrum started to occur. The long delay in developing a definitive MRS online is but one of the problems besetting CASA’s aviation medical section, without delving into the reasons for the protracted delay in appointing a full-time PMO.

This last administrative disaster in establishing a ‘processing fee’ of $130.00 for each and every medical examination form is beyond belief. The justification of the fee itself, let alone the amount of $130.00, should have been the subject of an open letter from CASA to all pilots and DAMEs many months prior to the arbitrary commencement date of the 1st January 2006.

Like many others, I await with interest the Minister for Transport and Regional Services’ response to the enquiries made by ASAM.

Bruce Short
Pennant Hills, New South Wales

(The letter to the Minister can be viewed on the ASAM website: www.asam.org.au. No response has as yet been received. Ed)

To the Editor:

I was one of the DAMEs who spent many hours on the phone to CASA in November 2005 when my new HECS key was issued. This followed two years of suggestions for improving the MRS online system which were ignored and not even acknowledged. I advised CASA that I would revert to the paper form until the system was fixed and I would now write to the Minister. I perform about 500 medicals per year and MRS online was taking about three times as long to complete. Shortly after I wrote to the Minister, I received a phone call from CASA inviting me to come to Canberra to provide assistance, but nothing eventuated.

I recently read the FAA Federal air surgeon’s medical bulleting lead article “New AMCS Version being prepared” which stated “....but all the comments on our system we received via e-mail, mail, face to face conversations and AME seminars have been evaluated, combined, and we are preparing to roll out the new, improved version of the on-line medical examinations. Yes folks, this new version includes many improvements that you recommended....”

The enthusiastic attitude of CAMI to Flight Surgeons in the USA is in marked contrast with the attitude of CASA to DAMEs. Why can’t we have a method of sending our suggestions to CASA and some assurance that they will be acted upon?

Heather Parker
Peregian Springs, Queensland

To the Editor:

In his letter, Dr Short refers to the issue of cost recovery by CASA for the assessment of medical examinations. I would like to take the opportunity to provide some feedback on this issue and in particular clarify the reasons behind the January 2006 implementation of these fees. Cost recovery is non-discretionary for CASA. In line with Australian Government policy, CASA was required to implement a system to recover costs that are associated with its regulatory functions. Medical fees are not the only service affected by such a user-pays system; licenses, ratings, aircraft registration and many other functions also operate under cost recovery. Some fees are charged at a flat rate and others at an hourly rate. Consultation with key industry figures in 2005 suggested a flat rate was the preferable option for medical fees. Avmed regulatory services were costed by an audit done at that time at $130/hr and the time taken per medical assessment was calculated at 1hr. Since that time, further analysis has been done on Avmed operating costs and on what proportion of the time is directly related to certificate processing. Various efficiencies have also been introduced. As a result of this review, it is proposed that from July 2007, the fee will reduce significantly to $75.

Ian Hosegood
Principal Medical Officer
Civil Aviation Safety Authority

To the Editor:

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To the Editor:

With regard to Dr Parker's letter about MRS online, I would like to take the opportunity to update readers of JASAM about some of the Information Technology initiatives that are currently underway within CASA Avmed. In the November edition of the DAME newsletter I mentioned that there was a project proposal to significantly upgrade the MRS online application. I can now advise that the project has approval and is underway. Some of the aims are to make the program more intuitive and easy to use as well as introducing time saving elements such as autofill and autocalculation of fields wherever possible. The questionnaire itself is also under review with the aims of shortening the online questionnaire as well as harmonising wherever possible the online and paper based forms. At the same time, work is underway to look at issues of stability and access as well as security. Recent upgrades have been made to improve stability and to ensure compatibility with IE7. Work is also underway to examine whether DAMEs might be able to be given access to certain portions of the CASA record. The next stage in the project is to seek input from DAMEs as to what enhancements or changes they would like to see. We would like to hear from both frequent users such as Dr Parker but also from those who do not use the system and try and ascertain why that is. Options for this consultation are currently under consideration and include fora such as online questionnaire, focus group or e-room discussions. I am confident that with the assistance and input of the DAME community we can develop a system that saves DAMEs and CASA time and improves the efficiency and effectiveness of the certification system. In the meantime, CASA already receives much useful input from DAMEs such as Dr Parker on the contact email addresses listed on the Avmed website at: http://www.casa.gov.au/avmed/contacts.htm

Ian Hosegood
Principal Medical Officer
Civil Aviation Safety Authority

The latest version of MRS online is now compatible with Internet Explorer version 7. The recent action by CASA seeking feedback on MRS online is welcome. However, there have been as yet no changes to the questionnaire as recommended by Dr Parker nearly a year ago. (Ed)

CASA was invited to provide comment on this paper prior to publication. Ed

To the Editor:

I would like to provide some feedback on the references to CASA policy and procedures. Each chapter of the DAME handbook is scheduled for review on an approximately 3 year cycle or 4 chapters per year. The malignancy chapter is currently under review following an oncology regulatory meeting in Wellington in late 2006.

CASA agrees that some of the information in this section is now superseded by advances in the relevant literature, particularly with reference to classification, but the aeromedical certification aspects are generally still appropriate.

With respect to thin melanoma lesions, although the handbook currently states rather categorically that certification will usually not occur for the first 12 months, it goes on to say "In some circumstances where the prognosis is extremely positive, certification prior to 12 months may be considered." This flexibility is almost universally applied by CASA in cases of thin lesions where excision is complete and recurrence risk is low.

For lesions with a poorer prognosis CASA applies an individual risk assessment based on all available prognostic indicators such as tumour thickness, ulceration, site, and nodal status. In these assessments, an article that has proved particularly useful is: An Evidence-based Staging System for Cutaneous Melanoma Charles M. Balch et. al. CA Cancer J Clin 2004;54;131-149.

In terms of the period of follow up, CASA agrees with Dr Pruim that for lesions with a poorer prognosis or evidence of recurrence, clinical follow up needs to extend for more than 5 years from the date of diagnosis. Contrary to Dr Pruim's comment, the handbook does not recommend "termination of follow up at 5 years post-diagnosis" rather that "these reports will be required for at least 3 years following return to unrestricted duties." The continued decline in the survival curves between 5 and 10 years will include patients who have died after having recurrences within the first 5 years. Patients with recurrence are unlikely to have received unrestricted medical certification.

Ian Hosegood
Principal Medical Officer
Civil Aviation Safety Authority

Aeromedical Certification of Thin Melanomas (page 16)

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Ian Hosegood
Principal Medical Officer
Civil Aviation Safety Authority
Member News

Congratulations

Dr Andrew Bruce Berry, High Range NSW, received an AM for service to medicine and to the community through the establishment and development of neonatal and paediatric retrieval services in New South Wales.

Wing Commander Gregory Norman, RAAF, received the Conspicuous Service Medal for outstanding service as the Commander Banda Aceh Medical Detachment while deployed as part of the First Response Force of Joint Task Force 629 in support of Operation SUMATRA ASSIST.

Dr Heather Mary Parker, Buderim QLD received an OAM in the Queen's birthday honours list for her service to medicine as a general practitioner and as a contributor to professional organisations, and to aviation.

Dr Robert Moffitt of Warrandyte, Vic, also received an OAM for service to medicine as a general practitioner, particularly to veterans and their families.

Dr Petar Novakovic of Mudgeeraba, Qld has received an OAM for service to medicine through the provision of ophthalmological services to people in remote areas of south west Queensland.

Dr James Ross has resigned from the RAAF and has accepted an appointment as Medical Director, SOS East Asia

Dr Ian Hosegood has taken up his appointment as Principal Medical Officer with the Civil Aviation Safety Authority.

Vale

Dr Hugh Ryan

ASAM has been advised that Dr Hugh Ryan AM passed away in December 2006 at the age of 94. Dr Ryan was an ophthalmologist based in Fitzroy, Melbourne. He became a member of AMSANZ in 1960. He had been a full-time medical officer in the air force and subsequently a reservist. He was awarded an AM in the Queen's birthday honours in June 2005 for service to medicine, particularly in the field of ophthalmology as a practitioner and researcher. He obtained an MBBS at the University of Melbourne in 1936.

For Sale

LANCE
T-Tail Piper Lance II, PA.32.RT300, VH-TLG is a 1978 model delivered in January 1979. The glove box has been removed from the panel to fit all of the additional avionics. This one owner 6/7 seat, single engine aircraft has always been maintained at Moorabbin initially; and then at General Aviation Maintenance, Essendon for many years. The engine and the airframe are in excellent condition.
Only 2200 hrs TT, fresh top O/H, 3 blade prop 450 hrs S/N. Loaded w/dual avionics, KLN90B App GPS & Trimble 2000 App GPS, Nav/Coms, ADF's, G/S, S/scope, HF, HSI, Alt III-C A/P w/coupler.
Price : Negotiable. Contact JA Henderson (03)5221-7131
In the Literature

Dr Brett Oppermann, MBBS DAvMed

As this is my first contribution to JASAM, I seek your indulgence in allowing me to first tell you a little about who I am and what this column will aim to do from this point forward. I was born and raised in Brisbane Queensland, graduating from the University of Queensland in 1997 before completing residency training at the Royal Brisbane Hospital, and then at the North West Regional Hospital, Burnie, Tasmania.

I then commenced service within the Royal Australian Air Force (RAAF) as a full-time uniformed Medical Officer, and it is during this time that my interest in Aviation Medicine was naturally fostered, with postings to East Sale and then to Edinburgh after completion of the Diploma in Aviation Medicine from the Royal College of Physicians of London in 2003. Whilst no longer in uniform, I continue to work for Air Force in my capacity as Clinical Aviation Medical Officer at the RAAF Institute of Aviation Medicine, with principle responsibilities in the areas of oversight of clinical standards for enlistment of aircrew within the Australian Defence Forces, and aeromedical decision-making in returning such individuals to duty after illness or injury.

I am currently studying toward a Master’s in Public Health, as the academic prerequisite to undertaking formal training in Occupational Medicine. I am soon to be married, and have a pet rabbit (though if he keeps up with chewing the electrical cord of every appliance he can get his furry little hands on, then my next column may well be a review of my favourite 101 BBQ rabbit recipes).

Cognisant of the diverse professional background of ASAM members, what I hope to achieve with this column is a review of articles and/or websites of general interest to all. In this, my first column, I provide an overview of an article by Dr Adrian Smith looking at hypoxia symptoms reported by Australian Army helicopter aircrew during operations below 10,000 feet.

Smith A. Hypoxia symptoms reported during helicopter operations below 10,000ft: a retrospective survey. Aviat Space Environ Med 2005; 76:794-8

As most would recall from any previous instruction in aviation physiology, and what you will find printed in most aviation medicine textbooks on the topic, the generally accepted upper limit of the “physiological zone” of the atmosphere (the altitude below which supplemental oxygen is not required for protection against hypoxia) is taken as 10,000 feet above mean sea level (AMSL). However, this statement is predicated on the subject individual remaining at rest, as physical activity accelerates the onset of hypoxia and lowers the altitude at which symptoms may occur. The author notes that this latter fact is not routinely emphasised to aircrew themselves during any aviation medicine instruction they may receive.

The author distributed an anonymous survey to Australian Army helicopter aircrew at the time of aviation medicine refresher training. Survey responses indicated that 88.7% of aircrew had experienced – or were aware of other aircrew experiencing – one or more of the listed features of hypoxia whilst operating at altitudes less than 10,000 ft AMSL. Non-pilot aircrew, including Loadmasters and Aircrewmn Technicians, reported a significantly higher number of symptoms, and reported them more commonly, than pilot aircrew, intuitively indicative of the significantly higher physical workloads of these personnel during certain flying operations. The mean altitude at which incidents were reported was 8462 ± 1112 SD feet AMSL, but incidents were reported as low as 6500 feet AMSL. The most common event reported was cognitive impairment experienced by (or observed in) Loadmaster aircrew whilst trying to calculate take-off and landing data (TOLD) cards, including instances whereby this task was simply not able to be completed by the affected individual, necessitating assistance from other crew, and other instances where significant errors of calculation were not noted until after landing. Another notable incident involved the aircraft captain who became euphoric and wanted to keep ascending the aircraft, necessitating the non-handling pilot to assume control. The affected pilot recovered when the aircraft descended to a lower altitude.

The author advises caution in interpretation of this data due to several biases that are inherent within a retrospective study of this nature, and other confounding issues that may be at play such as age, smoking status, and fatigue at time of reported incident. However, this study is a timely reminder to all aviation medicine practitioners and regulators about the potential hazards of hypoxia at altitudes lower than that typically anticipated. As also stated by the author, the data appears to support basic tenets of aviation medicine training, that is, that regular refresher training (and practical exposure to hypoxia) enable aircrew to recognise the features of hypoxia within themselves and within fellow crew should they occur in flight. As a result of this study, the curricula for initial and refresher rotary wing aircrew aviation medicine training within the Australian Defence Force has been amended.
ASAM and the authors of the papers submitted to the Journal are grateful for the help of all our reviewers. These reviewers contribute their expertise to peer review, a process that contributes critically to the quality of the Journal. We acknowledge, with special thanks, those who reviewed papers between January 2005 and December 2006: Gordon C Cable, Ian Cheng, Bernard Cresswell, David L Emonson, Tracy L Smart, Dougal Watson, Peter S Wilkins.
# Calendar of Events

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<tr>
<th>Date</th>
<th>Conference</th>
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<tr>
<td>06 – 09 September 2007</td>
<td>ASAM 2007 Annual Scientific Meeting “Infectious Disease – There is something in the Air”</td>
<td>Busselton, Western Australia</td>
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<td>16 – 20 September 2007</td>
<td>55th International Congress of Aviation and Space Medicine</td>
<td>Vienna, Austria</td>
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<td>3– 4 November 2007</td>
<td>AMSNSW Scientific Meeting</td>
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<td>AMSVIC Antarctic Study Expedition</td>
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<td>14 – 17 August 2008</td>
<td>ASAM 2008 Annual Scientific Meeting</td>
<td>Darwin, Northern Territory</td>
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Aviation Medicine Courses in Australia and New Zealand

Edith Cowan University, Perth, Australia

Courses offered:
Postgraduate Certificate in Aviation Medicine (PGCAvMed)

Reference:
http://postgradmed.ecu.edu.au/courses/courses.html#1

Convenor: Not stated

Comments: External or Distance Learning program

Monash University, Melbourne, Australia

Courses offered include:
Australian Certificate in Civil Aviation Medicine

Reference:

Convenor: Dr David Newman

Comments: On campus block course

University of Otago, Wellington, New Zealand

Courses offered include:
Postgraduate Diploma in Aviation Medicine
Postgraduate Certificate in Civil Aviation Medicine
Postgraduate Certificate in Aeromedical Evacuation
Master of Health Science (Aviation Medicine)
Doctor of Philosophy

Reference:
http://www.otago.ac.nz/Aviation_Medicine/

Convenor: Dr Rob Griffith

Comments: Internet based distance learning, teleconferences, and “summer schools”.

Travel Medicine Courses in Australia and New Zealand

James Cook University, Townsville, Australia

Courses offered include:
Postgraduate Certificate of Travel Medicine

Reference: http://www.jcu.edu.au

Convenor: Dr Peter Leggat

Comments: External studies or distance learning with block attendance and Internet support

University of Otago, Wellington, New Zealand

Courses offered include:
Postgraduate Certificate of Travel and Migrant Medicine
Postgraduate Diploma in General Practice (Travel and Migrant Medicine)
Master of General Practice (Travel and Migrant Medicine)

Reference: http://www.otago.ac.nz

Convenor: Dr Jenny Visser

Comments: External studies or distance learning with block attendance
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Departments of Physiology and Epidemiology & Preventative Medicine

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Each comprehensive course offers an exciting programme which includes airline flight-deck and simulator experience. Course participants will also gain personal experience of the effects of hypoxia, disorientation and other important aspects of aviation physiology.

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For a brochure and further details, please contact:

Short Course Administrator
Telephone: (61) 3 9903 0562
Facsimile: (61) 3 9903 0556
E-mail: shortcrs@med.monash.edu.au

Web address: www.med.monash.edu.au/epidemiology/accam

Course Convenor: Dr. David Newman

Departments of Physiology and Epidemiology & Preventive Medicine
Specialist Training in Occupational Medicine and Aviation Medicine is accessible and affordable for all doctors without the need for absences from work, except for a two day Residential School each year in Australia and NZ. The tutorials are offered to your home or surgery by teleconference, and individual supervision is available by phone, fax and Internet.

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- Airport and Travel Health
- Clinical Aviation Medicine
- Occupational Medicine (2 papers)
- Research options (1 or 2 papers)

For further information, for a prospectus and application form, contact Maureen Gordon, AvMed Administration, at the Department of Medicine, Wellington School of Medicine, New Zealand, at:

Fax: 64-4-3895427
Ph: 64-4-3855590
Email: deptmed@wnmeds.ac.nz
Post: PO Box 7343, Wellington South, New Zealand

or

Dr Robin Griffiths, Senior Lecturer in Aviation Medicine
Fax: 64-4-4962050
Ph: 64-021 620 148
Email: rfgriff@attglobal.net

for further information:

Home page - http://www.otago.ac.nz/Web_menus/Dept_Homepages/aviation/
Information for authors

NEXT ISSUE OF JASAM
(Volume 3, No 2)

Due for Publication: 10 December 2007
Deadline for submissions: 31 August 2007

JASAM welcomes contributions including case studies and letters to the Editor on any aspect of aerospace medicine.

Manuscripts must be offered exclusively to JASAM unless the manuscript is accompanied by a copyright exemption.

All manuscripts are subject to peer review and to editing.

Contributions should be sent to:
The Editor
JASAM
Australasian Society of Aerospace Medicine
P O Box 4022
BALWYN VIC 3103
or by e-mail to: wharrex@bigpond.net.au

Requirements for Manuscripts

JASAM follows the agreed conventions for medical journals. Full details of the requirements for manuscript preparation are available on the internet at the site http://www.icmje.org

An electronic copy (on disc or sent by e-mail) should be submitted. The copy should be able to be read in MS Word and formatted to A4 paper, using Arial or Times New Roman 10 font. Reviewers will be provided with a copy with authors’ names, affiliations and acknowledgements removed.

The title page should contain the title, list the names and qualifications of all authors as well as the position and institutional address at the time of submission. One author should be identified as the correspondent along with his or her postal address, telephone number and email address.

An abstract of not more than 250 words should be included with headings for background, methods, results and conclusion.

Abbreviations should be avoided and if used only after they have appeared in brackets after the completed expression – e.g., Civil Aviation Safety Authority (CASA). SI units should be used but altitude may be expressed in feet.

Figures and Tables are encouraged and should be entered on separate pages and numbered sequentially underneath e.g. Figure 1 or Table 1 with an appropriate self-explanatory legend. Their preferred location should be indicated in the manuscript.

References should be presented in the “Vancouver” style. References should be numbered consecutively as they appear in the text as superscript numbers (e.g., text1). An example of the format for journals and books is given below:


Permission to reprint articles will be granted by the Editor, subject to the author’s agreement, provided that an acknowledgement giving the original date of publication in JASAM is printed with the article.

Reviewers

All articles will be subject to blind review by at least two reviewers. Members with expertise who are willing to join the panel to review articles for publication are invited to contact the Editor.

Editors’ contact details

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