The Australasian College of Aerospace Medicine

Training Curriculum
Aerospace Medicine Training Program
The Australasian College of Aerospace Medicine

TRAINING CURRICULUM

For the
Aerospace Medicine Training Program
ACKNOWLEDGEMENTS

Reserved
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Aerospace Medicine Specialist Continuum of Learning
Training pathway for Aerospace Medicine Specialists:

- **Initial Medical Qualification**
- **Clinical Experience**
  - 5 years primary care or 3 years of specialty training
- **Aerospace Medicine Curriculum**
  - Mentored training program and assessments
- **FACAsM**
- **Continuing Professional Development**
  - Lifelong Learning

**Postgraduate Diploma or Masters in Aerospace Medicine**
Must have completed, or plan to complete during the training period, postgraduate training in aerospace medicine at the level of a Diploma or Master’s degree from an approved institution.
THE CONTEXT OF TRAINING

Aerospace medicine - also called ‘aviation medicine’ - is the medical specialty concerned with the interaction between the aviation environment and human physiology. It is concerned with the physiological stresses experienced by a healthy person in flight, and the interaction between the aviation environment and underlying health problems - in passengers as well as in aircrew. It is also concerned with sustaining and enhancing the performance of those engaged in flight operations. Aerospace medicine also encompasses the health, safety, and working environments of those ground personnel engaged in support of air operations.

The aviation environment poses significant physical and physiological hazards: reduced barometric pressure, hypoxia, extremes of temperature, noise, vibration, fatigue, acceleration forces, poor ergonomics, exposure to smoke and fumes. There is also the ever-present risk of having to eject or impacting terrain.

Aerospace medicine promotes flight safety by maintaining the health and sustaining performance of those engaged in air operations, training aircrew to recognise and respond appropriately to the limitations of a sea-level-adapted body in an aviation environment, and conducting research into the health and performance impacts of exposure to the flight environment. A specialist in aerospace medicine has the responsibility to promote the safety of flight operations through health surveillance programmes. Aerospace medicine includes primary, secondary, and tertiary prevention of harm, through regular medical surveillance of aircrew, appropriate management and aeromedical disposition of aircrew with disease, and the rehabilitation and return to flying of suitable candidates.

Returning a pilot to flying involves not only knowledge of the disease process and management, but also an understanding of the disease in the context of the stresses of flight, the risk of incapacitation, ability to function in arduous conditions - both in terms of the impact of the underlying condition on flight safety, as well as the potential impact the aviation environment may have on the disease process.

The practice of aerospace medicine is holistic, dealing with individuals in the context of occupational and operational systems where flight safety is paramount. Although the specialist in aerospace medicine may at times need to represent a pilot to an employer or regulatory authority, they must at all times act in the interests of flight safety.

Although aerospace medicine shares some commonality with primary health care, occupational medicine, and preventive health, it also relies heavily on a knowledge of non-medical disciplines such human factors, aerospace engineering, industrial hygiene, anthropometry, and ergonomics. The availability of health providers who are competent in the practice of aerospace medicine is a cornerstone of flight safety; however, the knowledge and skills required to practice aerospace medicine have developed to such a degree that a comprehensive understanding of the discipline by every medical practitioner cannot be expected. This is the basis of offering clinical training and specialist qualifications in aerospace medicine. Aerospace medicine is not merely ‘being a clinician in an aviation setting’.

The Australasian College of Aerospace Medicine was established in 2011 to meet the need to train and credential specialists in aerospace medicine in Australia and New Zealand.
OVERVIEW OF THE CURRICULUM

The Australasian College of Aerospace Medicine has aligned its training curriculum, assessments, competencies, CPD requirements, and standard for Fellowship to reflect, as much as possible, the practices and standards that are acceptable to Royal Australasian College of Physicians (through its Chapters) and the Australian Medical Council. ACAsM has adopted this principle with a view to seeking aerospace medicine to be recognised as a clinical specialty accredited with the Australian Medical Council and the Medical Council of New Zealand.

Before undertaking training in aerospace medicine, the prospective Trainee must have had at least five years experience in primary health care, or have undergone at least three years of basic training with one of the specialist medical colleges in Australasia. In addition, the prospective Trainee must have completed an approved postgraduate coursework qualification in Aviation Medicine from a recognised training organisation and have at least two years of full-time experience in aerospace medicine. Part-time experience in aerospace medicine will be weighted proportionally. Trainees can expect that training under the ACAsM curriculum will take at least four years of full-time experience in aerospace medicine. The duration of training can be extended, to a certain extent, to accommodate part-time exposure to aerospace medicine. In addition to completing the application, a prospective Trainee can expect to be interviewed, to explore their reasons for undertaking the training and whether their work environment provides adequate exposure to aerospace medicine to support development of the required competencies.

The training programme aims to be flexible, allowing the Trainee to gain the experiences they need to develop their aerospace medicine competencies.

Competence is assessed throughout the training programme: Log Book experiences, regular meetings with a Supervisor, regular oral examinations, formal written assignments, scientific presentations and publications, and a final oral examination. Many of the assessments are contingent on the Trainee meeting specific milestones. The regular contacts between the Trainee, their Supervisor, and the ACAsM Assessment Committee provide the opportunity for continuous feedback throughout the training programme, so that areas of strength and weakness can be identified and the training program modified to best meet the needs of individual Trainees.

Successful completion of the training program will result in the Trainee being eligible for Fellowship of the Australasian College of Aerospace Medicine (FACAsM).
Competencies in Aerospace Medicine

The Aerospace Medicine Training Program follows the Aerospace Medicine Curriculum and the Professional Qualities Curriculum of the Royal Australasian College of Physicians. The two curricula integrate with each other. Supervisors and Trainees must refer to these curricula when putting together a training plan.

The Competencies for a specialist in Aerospace Medicine are covered by the 8 Domains of learning and comprise:

1. Principles and Sciences – Environmental Physiology in Flight
   1.1. Demonstrate practical application of knowledge of the following physical and physiological stresses of the flight environment:
   1.2. Demonstrate practical application of knowledge of the interactions between the stresses of flying and clinical disease and pathophysiological processes that accompany clinical and sub-clinical disease.
   1.3. Demonstrate practical application of knowledge of the proper use of aircrew life-support equipment and personal protective equipment to mitigate the stresses of flying, and the possible adverse effects of using them
   1.4. Demonstrate practical application of knowledge of the limitations of the visual and vestibular systems in the aviator, especially as they relate to disorientation, visual illusions, and motion sickness.

2. Hazards of the Aerospace Environment
   2.1. Demonstrate practical understanding of the principles of physical, chemical, biological, ergonomic, and psychosocial and other hazards to health in the aviation workplace, and the illnesses they can cause.
   2.2. Demonstrate practical understanding of the principles of health surveillance and health risk management in the aviation workplace.

3. Aerospace Medicine Regulation
   3.1. Demonstrate practical application of knowledge of the principles of aircrew certification, including the principle of risk assessment in the aeromedical decision-making process.
   3.2. Demonstrate practical application of knowledge of the role of the Specialist of Aerospace Medicine, with specific emphasis of their relationship to the aviator, an employer, and the regulator.
   3.3. Demonstrate practical application of knowledge of how the principles of aerospace medicine are applied not only to aviators, but also to other flight-safety critical trades in support of aviation, including air traffic control and aviation maintenance personnel.

4. Critical Appraisal of Information
   4.1. Demonstrate practical application of the principles of good scientific practice, including the ethical considerations of research, scientific design and methodology, appropriate use of statistics, interpretation and presentation of results, and communication of relevant findings to scientific and user communities.
   4.2. Demonstrate the ability to critically appraise the scientific literature, with specific reference to the ability to determine the merits of the literature based on appropriate research design, reporting of results, and appropriate use of statistics, ensuring that the findings, conclusions, and recommendations are based on sound science.

5. Clinical Aerospace Medicine
   5.1. Demonstrate the ability to assess a patient with clinical and sub-clinical disease in order to produce a valid differential diagnosis, undertake an appropriate investigation and management plan, in order to formulate and implement an aeromedical management plan.
   5.2. Demonstrate practical application of knowledge of the potential impact on flight safety of prescription and non-prescription medications, and the appropriate use of these agents in aviators.
Demonstrate practical application of knowledge of clinical medicine to be able to assess the presenting features, underlying pathophysiology, and management strategies that increase concern regarding the potential risk a clinical condition may pose to flight safety.

5.3. Demonstrate practical application of knowledge in assessing an individual’s fitness to fly, including the role of functional cockpit checks and in-flight assessments when required.

6. Safety and Accidents

6.1. Demonstrate practical application of knowledge of aviation life support systems to the assessment of clinical conditions and fitness for flight.

6.2. Demonstrate practical application of knowledge of aircraft systems and crashworthiness principles and human factors by contributing to aviation incident and accident investigations.

6.3. Demonstrate practical application of knowledge of aviation human factors, especially fatigue, information processing, perception, orientation and situation awareness, and decision-making.

6.4. Demonstrate practical application of knowledge of the interaction between aviation human factors, the stresses of flight, and the manifestation of clinical and sub-clinical diseases.

7. Special Interest Areas

7.1. Demonstrate a practical working knowledge of aeromedical problems associated with specialized areas of aeromedical practice such as space medicine, aeromedical evacuation, unmanned aerial systems, unpowered aircraft, parachuting, military aviation, ultralight aircraft, and commercial aviation.

8. Professional Qualities of a Specialist

8.1. Demonstrate practical application of the qualities that define the good clinical practice of a Specialist as described by the Professional Qualities Curriculum of the RACP in the areas of:

8.1.1. Communication
8.1.2. Quality and Safety
8.1.3. Teaching and Learning (Scholar)
8.1.4. Cultural Competency
8.1.5. Ethics
8.1.6. Clinical Decision Making
8.1.7. Leadership and Management
8.1.8. Health Advocacy
8.1.9. The Broader Context of Health

**General Principles of Training**

The purpose of training is to build on the cognitive and practical skills acquired during previous training and practice to produce a specialist in aerospace medicine competent to manage complex patient problems, to provide public health advice or to provide advice on such patients to other medical practitioners.

Training is a partnership between the Trainee, the College (represented by its Assessment sub-committee), and the Trainee’s Supervisor. Each partner has rights and responsibilities. The underlying philosophy of training is that the Trainee is self-motivated to learn. Provided there are appropriate opportunities for observation and learning, it is expected that the Trainee will develop clinical skills, knowledge and attitudes by working closely with Supervisors, who will also provide both formative and summative assessment. The standards required during training are met by satisfying the requirements of the ACAsM Assessment sub-committee.

Competence should be maintained through lifelong learning, maintenance of skills and continuous development of new skills. To this end, it is important that the Trainee become involved in the College’s CPD programme early in their training.
Duration and Content
Training includes academic coursework in fulfilment of a recognised post-graduate training in aerospace medicine at the level of a Diploma or Master’s degree from an approved institution. In addition, training includes a research project. Accredited research directed towards a Masters or PhD may be counted towards the training program, provided it has direct relevance to aerospace medicine. Time spent on research in areas that are judged by the ACAsM Education Committee to have little relevance to aerospace medicine would not be accredited towards training.

Training in aerospace medicine would typically occur over a four years period of fulltime experience in a setting with a substantial component of aerospace medicine. However, Trainees with ‘advanced standing’ may apply for the training period to be shortened.

Part-Time Training
‘Part-time training’ covers not only those who work part-time, but also those who work in a setting that only provides part-time exposure to aerospace medicine. Part-time training is acceptable, provided that the workload is equivalent to at least 15 hours per week. Trainees undertaking part-time training must meet the same standards as full-time Trainees. The total length of training is to be weighted to give the same exposure to aerospace medicine as would be encountered during full-time training. Approval and accreditation processes are the same as for full-time training, and training fees paid over the total period of training will not normally exceed those of full-time training.

Recognition of Prior Learning
ACAsM makes provision for Trainees to apply for ‘advanced standing’ for significant experience and relevant training which pre-dates the commencement of their involvement in the ACAsM training. The competencies developed during this previous experience or training may count towards partial fulfilment of training and assessment requirements for the FACAsM.

The ACAsM Education Committee will interview the Trainee requesting advanced standing, and will evaluate their competencies in order to form a judgement of how much this previous experience can count towards the ACAsM training programme, and how much additional study will be required before Fellowship can be awarded to them. Advanced standing may reduce the assessment requirements for candidates in the standard pathway to Fellowship; however, it will not reduce the entry requirements to the ACAsM training program, nor will it diminish the requirement to pass the final oral examination. Applicants for advanced standing must otherwise meet the standard eligibility criteria for entry to the ACAsM training program.

There are two main grounds to apply for advanced standing: Recognition of Current Competence and Recognition of Prior Learning. ‘Recognition of Current Competence’ recognises previous experience and existing competencies an Aerospace Medicine practitioner has developed before their entry to the College training programme. Granting of RCC involves assessment of relevant evidence of the applicant’s competence against the competency requirements of the College training programme. It is expected that applicants who seek RCC will be experienced aerospace medicine practitioners who have well-developed competency in aerospace medicine as a result of extensive work experience in relevant clinical and organisational settings.

‘Recognition of Prior Learning’ (RPL) recognises that certain competencies may already have been demonstrated through formal education (beyond a Diploma in Aviation Medicine), or through involvement in the training programme of another relevant specialist College or Faculty (eg. FAFOEM). RPL may be considered as follows:

- Within the previous 10 years, completion or part completion of a formally assessed and appropriate accredited Masters or doctorate level degree in a relevant discipline;
• Completion, or part completion, of at least one year of supervised and formally assessed specialist training in a relevant specialist training programme (as determined by the Education Committee on a case-by-case basis); or

• Completion, or part completion, of specialist training in aerospace medicine from a recognised overseas training programme (acceptable to the ACAsM Education Committee, on a case-by-case basis). The specialist training programme must lead to the awarding of a formal recognised specialist qualification. The program must have included competitive entry, a detailed curriculum, regular summative assessments and logged clinical experience.

Highly competent applicants will be acknowledged with an appropriate reduction in the training program requirements and implementation of an appropriate training plan. This may include one or more of the following:

• Reduction in the period of supervised training;

• Reduction in number of College training requirements/assignments to be met prior to the final oral examination;

• Waiver for certain assessment items (eg. a Trainee who has already published scientific material in an appropriate peer-review journal may request a waiver for these assessment items under the AcAsM training structure).

Except where the Education Committee recognises an overseas-trained doctor who has completed specialist training in aerospace medicine at a level equivalent to the ACAsM training programme, the maximum duration of advanced standing that would normally be approved is 36 months of a 48-month training period.

**Proposed Training Plan**

The Proposed Training Plan is an important foundation element of the training programme. This allows the Trainee to describe their plan for accommodating the requirements of the training programme, and incorporating the training programme into their work routine over the subsequent 12 months. The Proposed Training Plan should include considerations for the likely aeromedical workload, allocation of study time, scheduling workplace visits, and plans to complete post-graduate training in aerospace medicine within the allocated time. The Proposed Training Plan should also include considerations for potential interruptions arising from deployments, work surges, or lengthy involvement in non-aeromedical activities (eg. military staff courses).

The intent of the Proposed Training Plan is to project the training into the next year, and discuss potential problems with the Mentor. It must be completed prospectively for each year of training, although it can be revised at any time within that 12-month period if circumstances change. The Proposed Training Plan must be discussed fully with the Supervisor, who indicates their willingness to supervise the training by ‘endorsing’ the proposed training plan.

If the Supervisor is not happy to endorse the proposed training plan - if the workload does not allow for a significant exposure to the principles and practice of aerospace medicine in order to meet the necessary competencies - they should recommend that the Trainee seek for their training to be suspended until they return to an environment more favourable for training in aerospace medicine.

**Educational Activities and Study**

The Supervisor should encourage the Trainee to attend and participate in relevant conferences, courses, and workshops. An integral part of training is the completion of the assessment requirements, and a Supervisor must ensure that each full-time Trainee sets aside sufficient time each week to devote to study. It is vital that the teaching of aerospace medicine encompasses
routine clinical activities such as performing a routine aircrew medical, preparing an Aeromedical disposition report, assessing an aircrew member’s fitness to fly, or conducting a functional cockpit check. The Supervisor should ensure that the Trainee has an opportunity to discuss the practice of aerospace medicine, or a particular clinical or operational issue, with a senior colleague for approximately 30-60 minutes per week. Ideally, the Trainee should review a specific clinical topic, perhaps related to recent clinical experience. The Trainee should not expect the Supervisor to provide didactic teaching in this situation.

The Supervisor must clearly indicate his availability and that of other consultants and staff to whom the Trainee is responsible. The Supervisor should indicate what other staff would be valuable educators.

Research Projects
Where relevant, the Supervisor and Trainee should discuss prospective research and/or quality management projects, identifying suitable projects and planning the implementation of such activities within the framework of other clinical responsibilities.

Expected Outcomes at the Completion of Training
Graduates from this training program will be equipped to function effectively within the current and emerging professional, medical and societal contexts. At the completion of the training program in aerospace medicine, as defined by this curriculum, it is expected that a new Fellow will have developed the clinical skills and have acquired the theoretical knowledge for competent aerospace medicine practice.

It is expected that a new Fellow will be able to:

- Apply the skills of a specialist medical practitioner to:
  - diagnose and manage disease and injury in relation to aviation
  - determine the relationship between health and fitness to fly
  - advise on the effect of major contemporary health issues in aviation workplaces
  - conduct aircraft assessments in order to recognise, evaluate and control physical, chemical, biological, design-related and psychosocial hazards
  - retrieve, critically appraise and disseminate aviation health and safety information in readily understandable terms
- Apply management skills in order to:
  - coordinate and manage aviation health and safety programs, including health surveillance
  - effect relevant change in workplaces
  - negotiate and resolve conflict relating to aviation health and safety issues
- Communicate effectively in order to secure the provision of a safe and healthy aviation workplace
- Be an advocate for health in the aerospace industry and the broader community
- Interpret the legislative, regulatory, and medico-legal aspects of aerospace medicine and be able to apply these in practice
- Design, implement and manage a return to flying rehabilitation program
- Advise on the human effects of factors in the aviation environment that are physical, chemical, biological, psychosocial and mechanical
- Design, conduct, implement and evaluate preventive strategies in aviation workplaces
- Participate in continuing professional development in order to keep abreast of the latest developments in aerospace medicine, and aviation health and safety issues
- Recognise the limits of individual knowledge and seek advice from experts in related disciplines when relevant.
ASSESSMENT

Assessment of competence is continuous throughout training, and is based on satisfactory performance in the following:

1. Three written reports of 2 000 to 3 000 words, comprising
   a. one aeromedical case report;
   b. one literature review or evidence-based medicine report;
   c. one additional report, either case study or literature review.
2. A research project of direct relevance to aerospace medicine, 3 000 to 5 000 words, leading to;
   a. a scientific presentation at an approved conference; and
   b. a publication in an approved peer-reviewed scientific journal
3. At least two mini-Clinical Exams (mini-CEx) each year assessed ‘satisfactory’, one of which must be assessed by a Fellow other than the Supervisor;
4. At least two Case-based Discussions each year assessed ‘satisfactory’, one of which must be assessed by a Fellow other than the Supervisor; and
5. At least one Critical Appraisal of 500 to 1 000 words each year, critically reviewing a journal article in aerospace medicine (including as part of the initial peer-review process).
6. An exit examination.
Trainees should keep a copy of all assessment items in their portfolio.

Formative Assessment
The Supervisor will provide formative assessment (feedback on performance) throughout the training period. Such assessment assists the Trainee to evaluate their knowledge and skills, and to identify their individual strengths and weaknesses in a setting which is non-judgmental and non-threatening. Regular evaluation using the Supervisor’s report form orientates the Trainee to the expectations of the College during training in respect of competency standards. Regular evaluation will also alert the Supervisor and the Trainee to the Trainee’s ongoing needs, and will allow modification of training to the Trainee’s learning objectives. Positive feedback can strongly motivate a Trainee to further learning. Appropriate feedback in areas of deficiency should also motivate, and may stimulate the Supervisor and Trainee to review together the learning objectives set. Regular meetings with the Trainee, observation of history taking and physical examination, discussion of the interpretation of clinical findings, clinical evaluation of investigative procedures and discussion of rehabilitation planning and management are all appropriate clinical tools for formative assessment.

The Supervisor and Trainee should complete the Supervisor’s report together with the Certification of Log Book on two occasions: at the end of three months, and on completion of the period of training. Only the last report is to be forwarded to the ACAsM Assessment Committee on completion and will include the summative assessment of the period of training. On each occasion the Supervisor and Trainee should discuss both positive and negative aspects of the evaluation; where performance in any area has been unsatisfactory, the Supervisor must indicate remedial action to be taken. The next report must indicate the effectiveness of such action, and the need for further action. Expectations must be congruent with the level of training and past clinical experience.

Summative Assessment
The Supervisor has the responsibility to provide summative assessment (formal determination of competence) at intervals during the training period, evaluate the Trainee’s progress through the competencies in aerospace medicine, and review the Trainee’s Log Book of experience in aerospace medicine. The Supervisor Report includes comment on a range of different elements of the Trainee’s progress, and is one of the College’s most important means of evaluating the Trainee’s performance.
The Trainee should review the Supervisor’s Report. The Trainee should be aware that assessment includes humanistic qualities as well as other aspects of professional behaviour. In accepting the responsibility to be a Supervisor of a Trainee, the Supervisor accepts responsibility to provide the Trainee with a Supervisor’s Report. A Trainee has a right to expect their Supervisor to complete the report. It is very important that the Supervisor Report reflects as accurately as possible how the Trainee is progressing in their training towards the Fellowship in Aerospace medicine. The Trainee will forward the Supervisor’s Report to the ACAsM Education Committee.

**Supervisor’s Reports**

Supervisor Reports are a critical component of providing Trainees with feedback on their strengths and weaknesses, and provide the College Education Committee with an indication of how satisfactorily training is proceeding. The Supervisor’s report does not relate only to clinical competence, but also to the attitudes, behaviours, and ethical standards the Trainee exhibits in the course of their work. The Supervisor Reports also provide summative assessment of training for the period covered by the report.

Supervisor Report forms (including the certification of the logbook) are available on the ACAsM website. Supervisor Reports need to be submitted along with certification of the logbook for every 6 months of training, and need to be signed by the Supervisor and the Trainee.

**Satisfactory Supervisor’s Report**

A satisfactory Supervisor’s Report for each period will be one which signifies that the Trainee has met the expected standards of overall training during the period covered by the report.

**Unsatisfactory Supervisor’s Report**

A Supervisor’s Report which indicates that there are areas in which the Trainee falls below expected standards will result in the Trainee being advised of their performance and the areas that need to be improved, with a clear indication of what is expected at the next review. The ACAsM Education Committee will be notified. The next review should be scheduled for approximately three months.

If the Supervisor still considers the Trainee to be performing at a level below that expected of an aspiring specialist in aerospace medicine, the Chair of the ACAsM Teaching and Learning Sub-Committee will interview the Supervisor and the Trainee in order to determine an appropriate course of action. Possible courses of action include: independent review of the Trainee’s learning plan, Log Book, competencies, and assessments; remedial training; change of Supervisor; or suspension of training.

**Log Book**

Log Books are intended to demonstrate breadth of exposure in aerospace medicine. They need not necessarily contain large amounts of detail. Rather, it is important to demonstrate the volume of aeromedical work, and to show what sorts of cases have been seen, how the cases have been managed, and how the case has contributed to developing the Trainee’s knowledge of aerospace medicine. The Log Book should also record visits to aviation worksites, experience in and around aircraft, functional cockpit checks, formal and informal presentations delivered by the Trainee, as well as examples of policies or procedures where the Trainee has contributed an understanding of aerospace medicine. Together, the experiences in the Trainee’s Log Book should demonstrate their progress towards overall competence in aerospace medicine.

The Trainee should log the first 100 routine aircrew medical examinations only. Thereafter, the Log Book should reflect the Trainee’s experience in managing challenging clinical cases.

Log Books need to be reviewed by the Supervisor, and should form an important part of the regular meetings. The Supervisor can use the Log Book to guide teaching opportunities, and to inform
decisions about the Training Needs Analysis for the following six months. The Supervisor must sign the Trainee’s Log Book to endorse that the Trainee’s experiences are making a meaningful contribution to them gaining valuable experiences in aerospace medicine. The 6-monthly Supervisor’s Report contains an assessment of the Trainee’s Log Book.

Log Books do not need to be sent to the College unless the training program of an individual comes into question. In this instance, the Chair of the ACAsM Assessment Committee will request the Log Book as part of the independent review of training.

The Log Book should document the date, the aircrew role, a brief summary of the clinical situation and intervention, and a brief discussion of the experience gained by the Trainee. The Log Book needs to document that the Trainee has gained significant experience in the following areas:

- conducting aircrew medical examinations;
- managing a range of aeromedically-significant clinical conditions; and
- assessing fitness to resume flying duties.

The Log Book should include examples of aeromedical reports written by the Trainee, (eg. Aircrew Medical Employment Category Reviews, or functional cockpit assessments).

**Research Project**

While not all specialists in aerospace medicine actively participate in research, it is important that all have the skills to critically appraise scientific literature.

The purpose of the research project for assessment is therefore to enable Trainees to gain experience in research methods, in interpretation of research literature and in participation in research at some stage of their career should they so choose.

Trainees need to submit a report of a research project in which they have had significant involvement in design, conduct of research, and analysis of data. The written report should be 3000 to 5000 words. Original research published in an approved scientific journal within the previous three years might be an acceptable submission, provided the research has direct relevance to aerospace medicine.

The Research Project must be submitted with a completed Assessment Cover Sheet attached to the front of the report. In general terms, the Research Project would be structured as an academic article (introduction, literature review, methods, findings, discussion, conclusion) and be fully referenced in accordance with good academic practice. As a general guide to the expected quality, Research Projects should be of a standard appropriate for publication in a peer-reviewed journal. It is expected that a Research Project would result in a presentation at a scientific meeting, and publication in a peer-reviewed scientific journal; these will form part of the overall assessment of the Research, and will be marked separately.

A detailed set of guidelines will be made available to Trainees ahead of them undertaking the Research Project.

**Case Study**

The Trainee is required to submit at least one Case Study during their training. Case Studies should be approximately 2000 to 3000 words in length. The Case Study assessment is designed to allow a Trainee to demonstrate the capacity to think critically about a clinical condition in the context of aviation, and to demonstrate the ability to synthesize information from the scientific literature.

The Case Study should discuss all relevant clinical information, and should demonstrate a clear aeromedical concern.
The Trainee should discuss the clinical condition and treatment in detail, and should demonstrate a deep understanding of potential aeromedical issues, and propose a management plan and long-term aeromedical disposition that demonstrates their competence in aerospace medicine.

The case history should be submitted with an Assessment Cover Sheet completed and attached to the front of the case report. The Assessment sheet used by Fellows who assess the Case Study is available to Trainees for reference.

**Mini Clinical Evaluation**

A Mini-Clinical Evaluation Exercise (mini-CEX) encounter evaluates Trainees to assess aspects of clinical performance, including medical interviewing, physical examination, professional qualities, counselling skills, clinical judgment, organisation and efficiency.

A mini-CEX is designed to:

- guide Trainees’ learning through structured feedback;
- help improve communication, history taking, physical examination and professional practice;
- provide Trainees with an opportunity to be observed during interactions with patients and identify strategies to improve their practice; and
- be a teaching opportunity enabling the assessor to share their professional knowledge and experience.

A mini-CEX encounter involves Trainees being observed in their workplace consulting with a patient. Trainees are given feedback across a range of areas relating to professional qualities and clinical competence from an assessor immediately after the observation.

A mini-CEX encounter takes approximately 20-30 minutes, including a 10 - 15 minute feedback session.

Consultations for observation are chosen by assessors, with Trainees to complete encounters on a range of cases. Each encounter should focus on specific aspects of the consultation and represent a different clinical problem.

Trainees are responsible for ensuring that adequate encounters are completed.

Trainees may be assessed on any of the following topics:

- Clinical aspects of disease - presentation, examination findings, investigations;
- Aeromedical significance of a disease (including its treatment);
- Physiological basis for aeromedical significance;
- Short- and long-term aeromedical disposition;
- Management plan;
- Possible processes to assess fitness for flying.

**Case-based Discussion**

A Case-based Discussion evaluates the level of professional expertise and judgment exercised in clinical cases by a Trainee.

Case-based Discussions are designed to:

- guide the Trainee’s learning through structured feedback;
- help improve clinical decision making, clinical knowledge and patient management;
- provide the Trainee with an opportunity to discuss their approach to the case and identify strategies to improve their practice; and
• be a teaching opportunity enabling the assessor to share their professional knowledge and experience.

A Case-based Discussion encounter involves a comprehensive review of clinical cases between a Trainee and their Supervisor. The Trainee is given feedback from the Supervisor across a range of areas relating to clinical knowledge, clinical decision making and patient management.

A Case-based Discussion encounter takes approximately 30 minutes.

Cases for discussion are chosen by the Supervisor. A variety of cases in which the Trainee has had a significant role in clinical decision making and patient management can be used. The discussion can be focused on a single complex case or a series of cases that cover a wide range of aeromedically-significant conditions. The discussion should reflect the Trainee’s level of experience and be directly linked to competencies of aerospace medicine.

The Trainee is responsible for ensuring that adequate Case-based Discussions are scheduled during their training.

Areas for assessment:

• Clinical aspects of disease - presentation, examination findings, investigations
• Aeromedical significance of a disease (including its treatment)
• Physiological basis for aeromedical significance;
• Short- and long-term aeromedical disposition;
• Management plan;
• Possible processes to assess fitness for flying.

Completion of Training

Training is complete when the Trainee:

• has completed postgraduate training in aerospace medicine to the level of Diploma or Masters degree from a recognised institution;
• has completed four years experience in aerospace medicine during the training programme;
• has satisfied their Supervisor of their proficiency across the spectrum of competencies of a specialist in aerospace medicine;
• has met all reporting requirements of the training programme;
• has submitted all written assessments;
• has presented an original paper at a scientific meeting, and has had a manuscript published in a scientific journal; and
• has passed the required assessments.
## Schedule of Training Assessments

<table>
<thead>
<tr>
<th>Year Term</th>
<th>1.1</th>
<th>1.2</th>
<th>2.1</th>
<th>2.2</th>
<th>3.1</th>
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<tr>
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<td>Assignment 1: Aeromedical Case</td>
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<td>Assignment 4: Research Project</td>
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<td>Publication, Peer-Review Journal</td>
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*Items marked with asterix (*) need to be reviewed by the Supervisor, but do not need to be sent to the College. All other Reports and Assessments need to be sent to the College to be reviewed by ACAsM Education Committee.*
CURRICULUM DOMAINS, SUBDOMAINS, THEMES AND LEARNING OBJECTIVES

Each of the curriculum documents has been developed using a common format, thereby ensuring a degree of consistency and approach across the spectrum of training.

- **Domains**
  
The domains are the broad fields which group common or related areas of learning.

- **Sub-domains**
  
The sub-domains group more closely related areas of learning within a domain.

- **Themes**
  
The themes identify and link more specific aspects of learning into logical or related groups.

- **Learning Objectives**
  
The learning objectives outline the specific requirements of learning. They provide a focus for identifying and detailing the required knowledge, skills and attitudes. They also provide a context for specifying assessment standards and criteria as well as providing a context for identifying a range of teaching and learning strategies.
DOMAIN 1: PRINCIPLES AND SCIENCES – ENVIRONMENTAL PHYSIOLOGY IN FLIGHT

Overview of Domain 1:

An understanding of the underlying principles of the flight environment and normal human physiology (including biochemistry, anatomy and other medical sciences) builds the foundation on which the practice of aerospace medicine is built. On this sound foundation will be based the Aerospace Medicine Specialist’s approach to clinical assessment, practical application within the operational aviation and space environments, and management of their aviator patients.

This Domain will result in the trainee being able to:

1. Demonstrate practical application of knowledge of the following physical and physiological stresses of the flight environment:
2. Demonstrate practical application of knowledge of the interactions between the stresses of flying and clinical disease and pathophysiological processes that accompany clinical and sub-clinical disease.
3. Demonstrate practical application of knowledge of the limitations of the visual and vestibular systems in the aviator, especially as they relate to disorientation, visual illusions, and motion sickness.

Overview of assessment of this Domain:

- Consideration of physiology and flight environment in clinical case based discussions and mini-CEX.
- Written assignments and oral examinations assessing core knowledge.
- Supervisor observations and report

Learning and teaching for Domain 1:

In order to meet these Themes, trainees should consider the following methods:

- Complete recognised postgraduate training in aerospace medicine
- Undertake a practical experience of hypoxia training, disorientation simulation, night vision demonstration
- Participating in various forms of flight as a passenger (high performance, commercial flight deck, light aircraft, rotary wing)
- Experience flight deck procedures in full motion based flight simulators
- Case-based discussions with colleagues regarding physiological issues
- Case presentations or written assignments dealing with environmental physiology
- Reading of textbooks, journal articles and authoritative internet resources
### Subdomain 10: Basic Sciences

#### Theme 10.1: Principles of Flight

<table>
<thead>
<tr>
<th>Learning Objectives</th>
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</thead>
<tbody>
<tr>
<td>10.1.1. Apply knowledge of aircraft systems and operating environments to the practice of aviation medicine</td>
</tr>
<tr>
<td>10.1.2. Acquire a practical knowledge and experience of the conditions in which flight deck crew and other operators, including air traffic control workers, carry out their duties.</td>
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</table>

#### Theme 10.2: The Science of the Atmosphere

<table>
<thead>
<tr>
<th>Learning Objectives</th>
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</thead>
<tbody>
<tr>
<td>10.2.1. Demonstrate an understanding of the key physics principles underlying the structure and function of the Earth’s atmosphere relevant to human physiological function at altitude</td>
</tr>
</tbody>
</table>

### Subdomain 11: Environmental Physiology

#### Theme 11.1: Respiratory effects of altitude

<table>
<thead>
<tr>
<th>Learning Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.1.1. Explain elements of respiratory anatomy and physiology which are affected by altitude and aviation systems</td>
</tr>
<tr>
<td>11.1.2. Apply knowledge of the physiological effects of acute hypoxia to the recognition and management of hypoxia symptoms occurring in aviation workplaces.</td>
</tr>
</tbody>
</table>

#### Theme 11.2: Hypobaria

<table>
<thead>
<tr>
<th>Learning Objectives</th>
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</thead>
<tbody>
<tr>
<td>11.2.1. Diagnose and manage the effects of barotrauma</td>
</tr>
<tr>
<td>11.2.2. Diagnose and initiate management of decompression illness</td>
</tr>
<tr>
<td>11.2.3. Provide advice about the prevention of dysbaric illness</td>
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#### Theme 11.3: Long duration acceleration

<table>
<thead>
<tr>
<th>Learning Objectives</th>
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</thead>
<tbody>
<tr>
<td>11.3.1. Describe how the physiological effects of acceleration exposure can alter aircrew performance and how aircrew life support systems mitigate these effects</td>
</tr>
<tr>
<td>11.3.2. Assess the effects of long duration acceleration on healthy individuals and in disease</td>
</tr>
<tr>
<td>11.3.3. Determine fitness for flight in the high-G environment</td>
</tr>
<tr>
<td>Theme 11.4: Visual function in flight</td>
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<tr>
<td><strong>Learning Objectives</strong></td>
</tr>
<tr>
<td>11.4.1. Describe how visual function can affect the performance of aircrew</td>
</tr>
<tr>
<td>11.4.2. Apply knowledge of visual physiology to the assessment, management and prevention of visual illusions in flight</td>
</tr>
<tr>
<td>11.4.3. Describe human factors issues related to unaided and aided night vision, including how the use of Night Vision Devices can affect flight safety</td>
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<thead>
<tr>
<th>Theme 11.5: Spatial orientation and disorientation</th>
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<tbody>
<tr>
<td><strong>Learning Objectives</strong></td>
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<tr>
<td>11.5.1. Apply an understanding of the mechanisms of orientation to the assessment, management and prevention of spatial disorientation in flight</td>
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<tr>
<td>11.5.2. Competently advise aircrew about spatial disorientation countermeasures</td>
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<tr>
<th>Theme 11.6: Environmental noise</th>
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<tbody>
<tr>
<td><strong>Learning Objectives</strong></td>
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<tr>
<td>11.6.1. Assess human health and performance that may be affected by noise exposure</td>
<td></td>
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<tr>
<td>11.6.2. Carry out and interpret a noise risk assessment in the aviation workplace</td>
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<tr>
<td>11.6.3. Assess and advise on the use of hearing protection</td>
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<tr>
<th>Theme 11.7: Vibration</th>
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<tbody>
<tr>
<td><strong>Learning Objectives</strong></td>
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<tr>
<td>11.7.1. Assess the effects of vibration exposure on human performance and health</td>
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<tr>
<th>Theme 11.8: The thermal environment</th>
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<tr>
<td><strong>Learning Objectives</strong></td>
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<tr>
<td>11.8.1. Apply knowledge of human thermoregulation to the assessment of performance and health under conditions of thermal stress</td>
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<tr>
<th>Theme 11.9: Motion sickness</th>
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<tr>
<td><strong>Learning Objectives</strong></td>
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</tr>
<tr>
<td>11.9.1. Assess the impact of motion sickness on human performance</td>
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<tr>
<td>11.9.2. Manage motion sickness occurring in a flight environment</td>
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</table>
DOMAIN 2: HAZARDS OF THE AEROSPACE WORKPLACE

Overview of Domain 2:

A specialist in aerospace medicine must be able to use systematic approaches in evaluating hazards in the aerospace environment and use appropriate controls to counter and minimise the health effects. Attribution of causation, due diligence in harm minimisation and education of susceptible populations is integral to the development of skills and application of knowledge in this area.

This Domain will result in the trainee being able to:

1. Demonstrate practical understanding of the principles of physical, chemical, biological, ergonomic, and psychosocial and other hazards to health in the aviation workplace, and the illnesses they can cause.
2. Demonstrate practical understanding of the principles of health surveillance and health risk management in the aviation workplace.

Overview of assessment of this Domain:

- Consideration of environmental hazards in clinical case based discussions and mini-CEX.
- Written assignments and oral examinations assessing core knowledge.
- Supervisor observations and report

Learning and teaching for Domain 2:

In order to meet these learning objectives, trainees should consider the following methods:

- Participating in various forms of flight as a passenger (high performance, commercial flight deck, light aircraft, rotary wing)
- Visits to aerospace medicine workplaces
- Interaction with aerospace industry workers, management and aircrew
- Case-based discussions with colleagues and supervisors
- Textbook and peer-reviewed literature reading
- Complete a recognised postgraduate course in aerospace medicine
### Theme 20.1: Agents in the Aerospace Environment That Can Affect Health

**Learning Objectives**

| 20.1.1. | Describe the properties of physical agents in the aerospace environment that can affect health |
| 20.1.2. | Describe the properties of chemical agents in the aerospace environment that can affect health |
| 20.1.3. | Describe the properties of biological agents in the aerospace environment that can affect health |

### Theme 20.2: Health Effects of Aerospace Occupational and Environmental Hazards

**Learning Objectives**

| 20.2.1. | Describe the potential health effects of common and important physical, chemical, biological, ergonomic, radiation and psychosocial hazards in the aerospace workplace |

### Theme 20.3: Assessment and Control of Aerospace Environmental and Work-Related Hazards

**Learning Objectives**

| 20.3.1. | Outline the major hazards commonly found in aerospace workplaces |
| 20.3.2. | Describe the general principles of workplace assessment |
| 20.3.3. | Determine whether current hazard control mechanisms and procedures are satisfactory |
| 20.3.4. | Compile a report of a workplace assessment that can be understood by people without scientific expertise |
| 20.3.5. | Anticipate likely hazards at a workplace and, after inspection there, relate and make persuasive recommendations on the important issues |
| 20.3.6. | Involve other occupational health professionals |

### Theme 20.4: Management of Environmental Incidents

**Learning Objectives**

| 20.4.1. | Contribute to the development of health policy relating to exposure to hazards in the aerospace environment |
| 20.4.2. | Manage individuals exposed to environmental hazards arising from aerospace activities |
**Subdomain 21: Public and Population Health**

<table>
<thead>
<tr>
<th>Theme 21.1: Communicable Diseases</th>
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<tbody>
<tr>
<td>Learning Objectives</td>
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<tr>
<td>21.1.1. Respond to concerns about the transmission of communicable disease by means of air travel</td>
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<table>
<thead>
<tr>
<th>Theme 21.2: Investigation of Illness or Disease in the Aerospace Environment</th>
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<tbody>
<tr>
<td>Learning Objectives</td>
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<tr>
<td>21.2.1. Investigate an outbreak of an acute disorder, such as an infectious disease, or an apparent cluster of disease cases or symptom complaints</td>
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<td>21.2.2. Respond to the human and political factors that accompany events such as clusters or outbreaks</td>
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<tr>
<td>21.2.3. Identify and evaluate appropriate preventive measures following events such as clusters or outbreaks</td>
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<tr>
<td>21.2.4. Work with national and international public health and relevant agencies in the follow up of an infectious disease outbreak in the aerospace environment</td>
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<thead>
<tr>
<th>Theme 21.3: Food, Water, Air and Waste</th>
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<tbody>
<tr>
<td>Learning Objectives</td>
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<tr>
<td>21.3.1. Assess the safety of food and water supplies, cabin air and waste management systems on board aircraft</td>
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<tr>
<th>Theme 21.4: Passenger Health</th>
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<td>Learning Objectives</td>
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<tr>
<td>21.4.1. Assess the effects of travelling by air on the health of passengers</td>
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DOMAIN 3: AEROSPACE MEDICINE REGULATION

Overview of Domain 3:

The organisational environment of aerospace activities is highly regulated out of a need for, and constant striving towards, perfect safety. The aerospace medicine specialist is a component of the aerospace safety management system, and has to work within the legal framework of this regulatory environment. Knowledge of how this regulatory environment is structured is key to the process of aeromedical decision-making and underpins the safety role that aviation medical examiners undertake.

This Domain will allow the trainee to be able to:

1. Demonstrate practical application of knowledge of the principles of aircrew certification, including the principle of risk assessment in the aeromedical decision-making process.
2. Demonstrate practical application of knowledge of the role of the Specialist of Aerospace Medicine, with specific emphasis of their relationship to the aviator, an employer, and the regulator.
3. Demonstrate practical application of knowledge of how the principles of aerospace medicine are applied not only to aviators, but also to other flight-safety critical trades in support of aviation, including air traffic control and aviation maintenance personnel.

Overview of assessment of this Domain:

- Consideration of the legal and regulatory framework in which patients work in clinical case based discussions and mini-CEX.
- Written assignments and oral examinations assessing core knowledge.
- Supervisor observations and report

Learning and teaching for Domain 3:

In order to meet these learning objectives, trainees should consider the following methods:

- As an aviation medical examiner, conduct aviation medical assessments on behalf of a regulatory authority
- Case discussions including aeromedical decision making considerations
- Review of relevant International Conventions and Australian law including Acts, Regulations and other legislation
- Complete a recognised postgraduate course in aerospace medicine
- Reading of textbooks and journal articles
### Subdomain 30: Principles of Certification and Licencing

<table>
<thead>
<tr>
<th>Theme 30.1</th>
<th>Risk evaluation, assessment, management and mitigation</th>
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<tbody>
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<td>Learning Objectives</td>
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<tr>
<td>30.1.1.</td>
<td>Apply a Safety Management System approach to the practice of aeromedical certification and licencing</td>
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<thead>
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<th>Theme 30.2</th>
<th>Aeromedical decision making</th>
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<tr>
<td>30.2.1.</td>
<td>Demonstrate an understanding of how administrative law and principles of natural justice influence the aeromedical decision making process</td>
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<thead>
<tr>
<th>Theme 30.3</th>
<th>Role clarity in regulatory medicine</th>
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<td>Learning Objectives</td>
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<tr>
<td>30.3.1.</td>
<td>Describe the role, legal obligations training and currency requirements of Aviation Medical Examiners</td>
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<tr>
<td>30.3.2.</td>
<td>Apply knowledge of the role differences between treating and non-treating doctors to ethical practice as an Aviation Medical Examiner</td>
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### Subdomain 31: Regulatory Authorities, Systems and Organisations

<table>
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<tr>
<th>Theme 31.1</th>
<th>Nature of organisations</th>
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<tr>
<td>31.1.1.</td>
<td>Identify a regulatory authority’s approach to regulation as central, devolved, hybrid or self-declaration.</td>
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<thead>
<tr>
<th>Theme 31.2</th>
<th>Quality assurance systems</th>
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<td>Learning Objectives</td>
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<tr>
<td>31.2.1.</td>
<td>Describe the components of a process of quality assurance by continuous improvement within an organisation</td>
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<tr>
<th>Theme 31.3</th>
<th>International and National Frameworks for Aerospace medicine regulation</th>
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<tr>
<td>Learning Objectives</td>
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<tr>
<td>31.3.1.</td>
<td>Demonstrate the ability to apply relevant international and national legislation to the practice of aerospace medicine</td>
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</table>

Theme 31.4: Aerospace and inter-related Regulatory Authorities and Organisations
Theme 31.5: Compliance with the requirements of Aerospace Regulatory Authorities
Theme 31.6: Reporting and Communication
DOMAIN 4: CRITICAL APPRAISAL OF INFORMATION

Overview of Domain 4:

Evidence based decision making is critical to the practice of aerospace medicine. Furthermore, it is expected that specialists in aerospace medicine will be able to solve aeromedical problems through the application of scientific method.

The Domain will result in the trainee being able to:

1. Demonstrate practical application of the principles of good scientific practice, including the ethical considerations of research, scientific design and methodology, appropriate use of statistics, interpretation and presentation of results, and communication of relevant findings to scientific and user communities.
2. Demonstrate the ability to critically appraise the scientific literature, with specific reference to the ability to determine the merits of the literature based on appropriate research design, reporting of results, and appropriate use of statistics, ensuring that the findings, conclusions, and recommendations are based on sound science.

Overview of assessment of this Domain:

- Written research-based assignment
- Publication of research in a peer reviewed journal
- Scientific presentation at a conference
- Critical appraisal of published literature

Learning and teaching for Domain 4:

In order to meet these learning objectives, trainees should consider the following methods:

- Completion of a recognised postgraduate course in aerospace medicine at Masters level
- Critical discussion of published literature with colleagues
- Participate in journal clubs
- Assignment based literature review
- Aeromedical research project, presentation and publication in a peer reviewed journal
- Review of peer-reviewed evidence for each clinical case based discussion
### Subdomain 40: Critical Analysis

#### Theme 40.1: Finding and application of information for evidence-based practice

**Learning Objectives**

40.1.1. Demonstrate understanding of the principles of evidence-based medicine, the limitations of evidence and the challenge of applying research findings to daily clinical practice

#### Theme 40.2: Diagnostic and screening tests

**Learning Objectives**

40.2.1. Appraise a test in accord with the properties of the test and characteristics of those being tested

#### Theme 40.3: Evaluation of health interventions

**Learning Objectives**

40.3.1. Appraise the likely efficacy of a reported health intervention

40.3.2. Appraise the economic evaluation of an intervention

#### Theme 40.4: Attribution of cause

**Learning Objectives**

40.4.1. Appraise support for an alleged causal association between a health effect and an exposure

#### Theme 40.5: Compliance with preventive interventions and procedures

**Learning Objectives**

40.5.1. Appraise interventions including strategies to improve adherence to protective measures

### Subdomain 41: Research Methods

#### Theme 41.1: Research Procedure

**Learning Objectives**

41.1.1. Contribute to the development of new knowledge by active involvement in research

#### Theme 41.2: Ethical conduct of research

**Learning Objectives**

41.2.1. Understand and apply ethical principles underpinning the conduct of research
<table>
<thead>
<tr>
<th>Theme 41.3: Analysis, summary and depiction of data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning objectives</td>
</tr>
<tr>
<td>41.3.1. Discern the essence of a data set and summarise and depict this in a meaningful and logical way</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Theme 41.4: Research presentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning Objectives</td>
</tr>
<tr>
<td>41.4.1. Present research findings in a written form</td>
</tr>
<tr>
<td>41.4.2. Prepare and give a succinct oral presentation of an investigation</td>
</tr>
</tbody>
</table>
DOMAIN 5: CLINICAL AEROSPACE MEDICINE

Overview of Domain 5:

Aerospace Medicine Specialists should be able to collect clinical information through thorough and targeted history and clinical examination, perform and interpret office and bedside tests, interpret clinical findings using a diagnostic reasoning process, develop a working diagnosis, and propose a management plan that is evidence based and appropriate to the patient at hand. This professional process should be performed with acknowledgment of how the condition, its investigation and management will be potentially influenced by the aerospace environment, and how these elements will influence the passenger or aviator’s health and performance in the aerospace environment. The Aerospace Medicine Specialist will also consider the aerospace environment’s potential to be causative of, or contributory to, the development or evolution of disease.

This Domain will result in the trainee being able to:

1. Demonstrate the ability to assess a patient with clinical and sub-clinical disease in order to produce a valid differential diagnosis, undertake an appropriate investigation and management plan, and formulate and implement an aeromedical management plan.
2. Demonstrate practical application of knowledge of the potential impact on flight safety of prescription and non-prescription medications, and the appropriate use of these agents in aviators.
3. Demonstrate practical application of knowledge of clinical medicine to be able to assess the presenting features, underlying pathophysiology, and management strategies that increase concern regarding the potential risk a clinical condition may pose to flight safety.
4. Demonstrate practical application of knowledge in assessing an individual’s fitness to fly, including the role of functional cockpit checks and in-flight assessments when required.

Overview of assessment of this Domain:

- Written assignment comprehensively documenting a complex aeromedical case
- Mini-CEX
- Case-based discussions
- Written and oral examinations assessing core knowledge
- Supervisor observations and report

Learning and teaching for Domain 5:

In order to meet these learning objectives, trainees should consider the following methods:

- Case-based learning
- Reflective application of basic medical knowledge
- Clinical case presentations to colleagues and supervisors
- Reading of clinical journal articles and textbooks
- Complete a recognised postgraduate course in aerospace medicine
- Conduct aircrew medical examinations on behalf of a regulatory authority
### Theme 50.1: Clinical skills

**Learning Objectives**

- 50.1.1. Elicit the history and obtain other relevant data
- 50.1.2. Conduct an appropriate physical examination
- 50.1.3. Synthesise findings from history and physical examination to develop a differential diagnosis and management plan
- 50.1.4. Plan and arrange investigations appropriately
- 50.1.5. Take, record, and analyse an occupational and environmental history from an individual
- 50.1.6. Assess what has been gained from a clinical encounter, form an opinion, and decide the options of what to do next

### Theme 50.2: Patient care and therapeutics

**Learning Objectives**

- 50.2.1. Manage general care in the unwell patient
- 50.2.2. Prescribe aeromedically appropriate and safe pharmacotherapy
- 50.2.3. Incorporate health and wellness promotion in aeromedical practice
- 50.2.4. Manage patients with surgical problems that affect or are affected by the aerospace environment
- 50.2.5. Facilitate ongoing care planning

### Theme 50.3: Procedural skills

**Learning Objectives**

- 50.3.1. Prepare patient for procedure
- 50.3.2. Perform emergency and routine procedures
- 50.3.3. Provide care following procedure

### Theme 50.4: Management of medical problems

**Learning Objectives**

- 50.4.1. Recognise and manage the critically ill patient
- 50.4.2. Communicate with patients and their families/carers in an emergency situation
- 50.4.3. Manage life-threatening conditions that affect or are affected by the aerospace environment and be able to apply supportive care that is appropriate to the circumstances
- 50.4.4. Manage patients with undifferentiated presentations allegedly related to the aerospace environment
### Theme 51.1: Cardiology

**Learning Objectives**

- **51.1.1.** Manage cardiovascular conditions that affect or are affected by the aerospace environment
- **51.1.2.** Apply aeromedical decision making and risk management principles to the investigation and management of cardiovascular conditions

### Theme 51.2: Respiratory medicine

**Learning Objectives**

- **51.2.1.** Manage respiratory system and sleep conditions that affect or are affected by the aerospace environment
- **51.2.2.** Apply aeromedical decision making and risk management principles to the investigation and management of respiratory and sleep conditions

### Theme 51.3: Gastroenterology

**Learning Objectives**

- **51.3.1.** Manage gastroenterological conditions that affect or are affected by the aerospace environment
- **51.3.2.** Apply aeromedical decision making and risk management principles to the investigation and management of gastroenterological conditions

### Theme 51.4: Neurology and neurosurgery

**Learning Objectives**

- **51.4.1.** Manage neurological and neurosurgical conditions that affect or are affected by the aerospace environment
- **51.4.2.** Apply aeromedical decision making and risk management principles to the investigation and management of neurological and neurosurgical conditions

### Theme 51.5: Musculoskeletal system

**Learning Objectives**

- **51.5.1.** Manage musculoskeletal and connective tissue conditions that affect or are affected by the aerospace environment
- **51.5.2.** Apply aeromedical decision making and risk management principles to the investigation and management of musculoskeletal and connective tissue conditions
### Theme 51.6: Mental health

**Learning Objectives**

51.6.1. Manage mental health conditions that affect or are affected by the aerospace environment

51.6.2. Apply aeromedical decision making and risk management principles to the investigation and management of mental health conditions

### Theme 51.7: Maternal and women’s health

**Learning Objectives**

51.7.1. Manage conditions related to reproduction and pregnancy that affect or are affected by the aerospace environment

51.7.2. Apply aeromedical decision making and risk management principles to the investigation and management of conditions related to reproduction and pregnancy

### Theme 51.8: Endocrinology

**Learning Objectives**

51.8.1. Manage conditions of the endocrine system that affect or are affected by the aerospace environment

51.8.2. Apply aeromedical decision making and risk management principles to the investigation and management of disorders of the endocrine system

### Theme 51.9: Malignant disease

**Learning Objectives**

51.9.1. Manage neoplastic conditions that affect or are affected by the aerospace environment

51.9.2. Apply aeromedical decision making and risk management principles to the investigation and management of neoplastic conditions

### Theme 51.10: Ophthalmology

**Learning Objectives**

51.10.1. Manage patients with eye diseases that affect or are affected by the aerospace environment

51.10.2. Apply aeromedical decision making and risk management principles to the investigation and management of eye disorders

### Theme 51.11: Otorhinolaryngology

**Learning Objectives**

51.11.1. Manage ear, nose and throat conditions that affect or are affected by the aerospace environment

51.11.2. Apply aeromedical decision making and risk management principles to the investigation and management of ear, nose and throat disorders
### Theme 51.12: Genitourinary system

**Learning Objectives**

51.12.1. Manage renal and genitourinary conditions that affect or are affected by the aerospace environment

51.12.2. Apply aeromedical decision making and risk management principles to the investigation and management of eye disorders

### Theme 51.13: Haematology

**Learning Objectives**

51.13.1. Manage conditions of the blood-forming or immune systems that affect or are affected by occupation or environment

51.13.2. Apply aeromedical decision making and risk management principles to the investigation and management of blood-forming and immune disorders

### Theme 51.14: Dermatology

**Learning Objectives**

51.14.1. Manage skin conditions that affect or are affected by the aerospace environment

51.14.2. Apply aeromedical decision making and risk management principles to the investigation and management of skin conditions

### Subdomain 52: Fitness and Return to Work

#### Theme 52.1: Assessment of fitness for work in an aerospace environment

**Learning Objectives**

52.1.1. Perform medicals on aircrew and other aviation workers and define and understand the clinical standards of licensing requirements

52.1.2. Make judgments on clinical conditions to inform licensing and regulatory decision making

52.1.3. Review complex clinical conditions to inform regulatory decision making

52.1.4. Perform clinical assessment of disability and fitness for work and understand the principles of assessing fitness for work in aviation

#### Theme 52.2: Development and implementation of a vocational rehabilitation policy and program

**Learning Objectives**

52.2.1. Assess the task demands and environment of an aerospace worker

52.2.2. Perform a clinical assessment of a person’s fitness for work and flying

52.2.3. Describe the consequences of injury or illness and, in particular, its effect on a person’s ability to work or fly

52.2.4. Prepare and implement a return to flying or rehabilitation plan for an aerospace worker

52.2.5. Discuss with a patient the implications for employment and flying of medication and convalescence from procedures
DOMAIN 6: SAFETY AND ACCIDENTS

Overview of Domain 6:

Safety in aerospace medicine incorporates accident prevention through safety systems, injury and fatality prevention using aircraft, aircrew and passenger life support and safety equipment, and effective investigation of aircraft accidents in order to inform future developments for prevention of further incidents and accidents. The aerospace medicine specialist will be expected to have a working knowledge of each of these elements, such that they can consider these as part of their aeromedical decision-making process. Knowledge of the principles of accident investigation is also important so that the specialist in aerospace medicine can provide appropriate entry-level advice that will support subsequent formal and expert accident investigation procedures.

The field of Human Factors in aerospace medicine is a key component of safe operations and is an important element of all aspects of clinical aerospace medicine. Specialists should understand how human factors influence the performance of the aviator, aircraft, operation and system, and how health, disease and social elements are all human factors that can interact to influence aircrew performance.

This Domain will result in the trainee being able to:

1. Demonstrate practical application of knowledge of aviation life support systems to the assessment of clinical conditions and fitness for flight.
2. Demonstrate practical application of knowledge of aircraft systems and crashworthiness principles and human factors by contributing to aviation incident and accident investigations.
3. Demonstrate practical application of knowledge of aviation human factors, especially fatigue, information processing, perception, orientation and situation awareness, and decision-making.
4. Demonstrate practical application of knowledge of the interaction between aviation human factors, the stresses of flight, and the manifestation of clinical and sub-clinical diseases.

Overview of assessment of this Domain:

- Case-based discussions
- Written and oral examinations assessing core knowledge
- Supervisor observations and report

Learning and teaching for Domain 6:

In order to meet these learning objectives, trainees should consider the following methods:

- Reading of the peer reviewed literature and textbooks
- Completion of a recognised postgraduate course in aerospace medicine
- Visit aircraft engineering facilities
- Interaction with aircrew and life support engineers and maintainers
- Examine first hand aircraft safety and life-support equipment
- Participate in or observe an airport crash exercise
- Flight deck observation
**Subdomain 60: Aerospace Incidents and Accidents**

### Theme 60.1: Aircraft life support equipment

**Learning Objectives**

- 60.1.1. Describe the structure and function of aerospace systems engineered to support normal human physiology.
- 60.1.2. Evaluate the contribution of life support system malfunctions to aerospace incidents and accidents

### Theme 60.2: Aircrew life support equipment

**Learning Objectives**

- 60.2.1. Demonstrate the function of personal protective equipment in mitigating effects of high altitude exposure.
- 60.2.2. Assess the effectiveness of head protection systems.
- 60.2.3. Assess how life support equipment integrates with other aircraft systems.
- 60.2.4. Assess aircraft occupant anthropometry and cockpit space limitations.

### Theme 60.3: Crashworthiness

**Learning Objectives**

- 60.3.1. Carry out aircraft structural assessments and identify hazards that might cause injury in an accident.
- 60.3.2. Assess the performance of aircraft restraint systems.
- 60.3.3. Assess the energy attenuating capabilities of aircraft structures and of seat systems.
- 60.3.4. Assess post crash survivability.

### Theme 60.4: Aircraft accident response

**Learning Objectives**

- 60.4.1. Demonstrate the ability to coordinate the initial medical response to an aircraft incident or accident.

### Theme 60.5: Aircraft accident investigation

**Learning objectives**

- 60.5.1. Work safely at an accident site.
- 60.5.2. Document evidence at an accident site.
- 60.5.3. Identify morphological abnormalities and interpret autopsy and clinical findings in relation to the injury mechanisms.

**Subdomain 61: Factors in Performance and Safety**

### Theme 61.1: Systems for safety

**Learning Objectives**

- 61.1.1. Describe the ways that Safety Management Systems can be implemented to enhance safety in the aerospace industry.
| Theme 61.2: Organisational factors affecting health and safety performance |
| Learning Objectives |
| 61.2.1. Evaluate the impact of organisational factors in the causation of aviation incidents and accidents |

| Theme 61.3: Human factors in performance and safety |
| Learning Objectives |
| 61.3.1. Assess human factors issues contributing to aviation incidents and accidents |
| 61.3.2. Classify human errors and describe how they contribute to aviation incidents and accidents |
| 61.3.3. Assess the human factors issues associated with the design of flight decks |
| 61.3.4. Mitigate the effects of fatigue on aviation operations |

| Theme 61.4: Crew resource management |
| Learning Objectives |
| 61.4.1. Assess the effectiveness of crew resource management in flight deck operations |
| 61.4.2. Enhance awareness of human factors in crew and management |
DOMAINE 7: SPECIAL INTEREST AREAS

Overview of Domain 7:

There are a number of small but important areas of aerospace medicine that require a general level of knowledge for all aerospace medicine specialist without necessarily requiring a full or comprehensive course of specialist study. Broad knowledge of the principles of these areas will allow the aerospace medicine specialist to understand their own limitations of knowledge, provide important safety information, and recommend higher level specialist involvement.

This Domain will result in the trainee being able to:

1. Demonstrate a practical working knowledge of aeromedical problems associated with specialized areas of aeromedical practice such as space medicine, aeromedical evacuation, unmanned aerial systems, unpowered aircraft, parachuting, military aviation, ultralight aircraft, and commercial aviation.

Overview of assessment of this Domain:

- Case based clinical discussions
- Written and oral examinations assessing core knowledge
- Written assignments
- Supervisor observations and report

Learning and teaching for Domain 7:

[describe methods recommended for achieving these Themes]

In order to meet these learning objectives, trainees should consider the following methods:

- Consider clinical cases from each sub-domain with colleagues and supervisors
- Observational visits to specialised facilities – for example gliding clubs, parachute schools, manned spaceflight facilities, centres of military aviation medicine
- Observe aeromedical evacuation flights
- Seek out journal articles, books and internet resources relevant to speciality areas
- Complete a recognised postgraduate course in aerospace medicine
### Subdomain 70: Space Medicine

**Theme 70.1: The space environment**

**Learning Objectives**

70.1.1. Outline the physical properties of the space environment that affect human physiological function

**Theme 70.2: Physiological adaptations to space flight**

**Learning Objectives**

70.2.1. Describe the physiological consequences and adaptations that occur with short and long duration exposure to the space environment

**Theme 70.3: Physiologic countermeasures for space flight**

**Learning Objectives**

70.3.1. Describe engineering solutions and life support systems used to mitigate the adverse physiological consequences of spaceflight

**Theme 70.4: Commercial space operations**

**Learning Objectives**

70.4.1. Assess the impact of short duration spaceflight on passengers with clinical conditions and pathology

70.4.2. Apply knowledge of the space environment to determine fitness for commercial spaceflight as a passenger

### Subdomain 71: Aeromedical Evacuation

**Theme 71.1: Principles of AME**

**Learning Objectives**

71.1.1. Apply knowledge of the aerospace environment and altitude physiology to coordinating the safe transport of patients by air

**Theme 71.2: Patient Management**

**Learning objectives**

**Theme 71.3: Identify clinical management issues in critically ill patients arising from the aeromedical transport environment**

**Theme 71.4: Education and Training**

**Learning Objectives**

71.4.1. Identify the initial and ongoing training needs of medical crews involved routinely in aeromedical transport

**Theme 71.5: Aerospace Transport Platforms**

**Learning objectives**

71.5.1. Apply knowledge of different aircraft types, their systems and flight characteristics, to the appropriate selection of transport for the critically ill
### Theme 71.6: Medical Equipment

**Learning Objectives**

- 71.6.1. Anticipate medical equipment requirements for aeromedical evacuations
- 71.6.2. Assess medical equipment compatibility with the aeromedical transport platform used

### Subdomain 72: Unmanned Aerial Systems

#### Theme 72.1: Unmanned aerial systems (UAS)

**Learning Objectives**

- 72.1.1. Apply knowledge of the operating environment of UAS in assessing and managing the health of UAS operators

### Subdomain 73: Unpowered Aircraft

#### Theme 73.1: Unpowered aircraft

**Learning Objectives**

- 73.1.1. Apply knowledge of unpowered aircraft, their systems and operating environments to the practice of aviation medicine
- 73.1.2. Assess fitness for flight in unpowered aircraft

### Subdomain 74: Parachuting

#### Theme 74.1: Parachuting

**Learning Objectives**

- 74.1.1. Apply knowledge of the altitude physiology to assess the fitness, and manage the health, of parachutists

### Subdomain 75: Military Aviation

#### Theme 75.1: Military aviation platforms

**Learning Objectives**

- 75.1.1. Apply knowledge of the differences and similarities between military and civilian aircraft, life support equipment and aviation operations to the determination of fitness for military flight

#### Theme 75.2: Assisted escape systems

**Learning Objectives**

- 75.2.1. Describe the biodynamic forces in a typical ejection sequence
- 75.2.2. Predict injury patterns that might be experienced based on seat-specific and occupant-specific factors
- 75.2.3. Coordinate post-ejection rescue and manage ejection-related injuries
Subdomain 76: Ultralight Aircraft

<table>
<thead>
<tr>
<th>Theme 76.1: Ultralight aircraft</th>
<th>Learning Objectives</th>
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</thead>
<tbody>
<tr>
<td>76.1.1. Apply knowledge of ultralight aircraft, their systems and operating environments to the practice of aviation medicine</td>
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<tr>
<td>76.1.2. Assess fitness for flight in ultralight aircraft</td>
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Subdomain 77: Commercial Aviation

<table>
<thead>
<tr>
<th>Theme 77.1: Commercial aviation</th>
<th>Learning Objectives</th>
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<tbody>
<tr>
<td>77.1.1. Address health concerns raised by flight crews that are specific to short and long haul commercial aviation operations</td>
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</table>
Overview of Domain 8:
The Domain will result in the trainee being able to demonstrate practical application of the qualities that define the good clinical practice of a Specialist as described by the Professional Qualities Curriculum of the RACP in the areas of:

- Communication
- Quality and Safety
- Teaching and Learning (Scholar)
- Cultural Competency
- Ethics
- Clinical Decision Making
- Leadership and Management
- Health Advocacy
- The Broader Context of Health

Overview of assessment of this Domain:
- Supervisor observations and report
- Mini-CEX
- Case-based discussions
- Research presentation

Learning and teaching for Domain 8:
In order to meet these learning objectives, trainees should consider the following methods:

- Simulations and role-plays
- Video recording of consultations
- Reflective application of existing clinical skills
- Guided instruction by supervisors or mentors
- Critical reflection on consultations and interactions
- Communication skills training
- Interaction with aircrew, management and others in the aerospace industry
- Presenting to groups – aircrew, colleagues, aviation management
- Discussions with peers
- Participate in CPD programs
### Theme 80.1: Physician-patient communication

**Learning Objectives**

- 80.1.1. Apply communication skills to engage and reassure the patient in specific situations including first encounters, history taking, counselling and breaking bad news.
- 80.1.2. Empower patients and be respectful of their rights in all aspects of communication.

### Theme 80.2: Communicating with colleagues and the broader health care team

**Learning Objectives**

- 80.2.1. Communicate effectively within multidisciplinary teams.
- 80.2.2. Communicate effectively with referring doctors, and when referring a patient to another specialist.
- 80.2.3. Apply communication skills to facilitate effective clinical handover and transfer of care.
- 80.2.4. Communicate effectively with health administration.

### Theme 80.3: Communication with a third party, including the patient’s employer or their family and/or carers

**Learning Objectives**

- 80.3.1. Apply communication skills in encounters with a third party, including a patient’s employer or family (including extended family) and/or carers.

### Theme 80.4: Communication with the broader community

**Learning Objectives**

- 80.4.1. Communicate effectively with support organisations, administrative bodies, governments and others in the wider community.
- 80.4.2. Demonstrate the ability to apply specific medico-legal communication practices.
- 80.4.3. Describe the ethical and legal constraints on communicating medical information to a third party.
- 80.4.4. Identify and address barriers to communication in a non-medical workplace.

### Theme 80.5: The Influencing of groups

**Learning Objectives**

- 80.5.1. Demonstrate understanding of the modalities of influence within an organisation.
- 80.5.2. Present a talk on an aviation safety topic to a group of workers.
- 80.5.3. Address an aerospace medicine issue at a meeting of more than a dozen interested people.
- 80.5.4. Offer expert evidence to a government or judicial inquiry on an aeromedical issue.
- 80.5.5. Participate effectively as a member or chairperson of a committee.
### Subdomain 81: Quality and safety

#### Theme 81.1: Use of evidence and information

**Learning Objectives**

- **81.1.1.** Use evidence to inform quality improvement

#### Theme 81.2: Safe practice

**Learning Objectives**

- **81.3.1.** Facilitate safe prescribing and administration of medication and display an understanding of the associated error types, causes, and risks
- **81.3.2.** Promote safe continuity of care for patients

#### Theme 81.4: Identification, prevention and management of potential harm

**Learning Objectives**

- **81.4.1.** Recognise, report on and manage adverse events and error
- **81.4.2.** Identify, establish, implement and/or comply with relevant risk-management and risk-minimisation procedures
- **81.4.3.** Identify risks to health arising from one’s own work activities
- **81.4.4.** Understand the process of managing complaints and how to utilise complaints to enhance medical care

### Subdomain 82: Teaching and Learning

#### Theme 82.1: Ongoing learning

**Learning Objectives**

- **82.1.1.** Participate in effective continuing professional and educational development

#### Theme 82.2: Educator

**Learning Objectives**

- **82.2.1.** Recognise the importance of health education and the role of the physician as a teacher to patients, other physicians and in the wider community, and develop the skills to undertake this role
### Subdomain 83: Cultural Competency

#### Theme 83.1: Cultural Competency

<table>
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<tr>
<th>Learning Objectives</th>
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<tbody>
<tr>
<td>83.1.1. Manage one’s own cultural competency development</td>
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<tr>
<td>83.1.2. Demonstrate the ability to communicate effectively with people from culturally and linguistically diverse backgrounds</td>
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<tr>
<td>83.1.3. Apply specific knowledge of the patient’s cultural and religious background, attitudes and beliefs in managing and treating the patient</td>
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<tr>
<td>83.1.4. Identify and act on cultural bias within health care services and other organisations</td>
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<tr>
<td>83.1.5. Demonstrate the ability to promote effective cross-cultural partnerships and culturally diverse teams to improve health outcomes</td>
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### Subdomain 84: Ethics

#### Theme 84.1: Professional Ethics

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<th>Learning Objectives</th>
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<tbody>
<tr>
<td>84.1.1. Demonstrate ability to apply an ethical framework in clinical practice</td>
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#### Theme 84.2: Personal Ethics

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<th>Learning Objectives</th>
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<tbody>
<tr>
<td>84.3.1. Demonstrate the ability to reflect critically on personal beliefs, biases and behaviours, and their alignment with health care policy and impact on interaction with patients</td>
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#### Theme 84.3: Develop a sound professional standard of personal conduct

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<th>Learning Objectives</th>
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<tbody>
<tr>
<td>84.3.1. Demonstrate the ability to reflect critically on personal beliefs, biases and behaviours, and their alignment with health care policy and impact on interaction with patients</td>
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#### Theme 84.4: Ethics and Health Law

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<th>Learning Objectives</th>
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<tr>
<td>84.4.1. Demonstrate the ability to apply legal and ethical frameworks to physician-patient relationships</td>
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<tr>
<td>84.4.2. Demonstrate the ability to apply relevant legislation and ethical frameworks to interactions outside the direct physician-patient relationship</td>
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### Subdomain 85: Leadership and Management

#### Theme 85.1: Self-management

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<tr>
<td>85.1.1. Implement and model effective self-management practices</td>
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<tr>
<td>85.1.2. Identify personal attributes or health issues that could impair one’s performance at work</td>
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#### Theme 85.2: Leadership and management of others

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<thead>
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<th>Learning Objectives</th>
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<tbody>
<tr>
<td>85.2.1. Demonstrate ability to provide leadership and effectively manage others</td>
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</table>
### Subdomain 86: Health Advocacy

#### Theme 86.1: Advocacy for the patient
**Learning Objectives**

86.1.1. Know and apply the key principles, processes and limitations of advocacy

#### Theme 86.2: Individual advocacy
**Learning Objectives**

86.2.1. Identify and address key issues affecting personal work environment and recognise the role of advocacy

#### Theme 86.3: Group advocacy
**Learning Objectives**

86.3.1. Demonstrate an understanding of the necessary steps required to effect change within organisations and the community

### Subdomain 87: The Broader Context of Health

#### Theme 87.1: Burden of Disease
**Learning Objectives**

87.1.1. Demonstrate an awareness of the health priorities for the local community, and more broadly for Australia and New Zealand

#### Theme 87.2: Determinants of Health
**Learning Objectives**

87.2.1. Identify and define the determinants of health

#### Theme 87.3: Prevention and Control
**Learning Objectives**

87.3.1.  
87.3.2. Adopt a population health approach to the prevention of illness, promotion of health and control of disease

#### Theme 87.4: Priority Population Groups
**Learning Objectives**

87.4.1. Implement strategies to reduce inequities in health status between population groups

#### Theme 87.5: Economics of Health
**Learning Objectives**

87.5.1. Demonstrate a basic understanding of the societal, political and economic pressures that influence the way funding is provided and used