

**SPECIALTY TRAINING CURRICULUM**

**FOR**

**AVIATION AND SPACE MEDICINE**

**2016**

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**Joint Royal Colleges of Physicians Training Board**

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## **1 Introduction**

Flying is now a commonplace activity with many millions of people flying each year in UK registered aircraft. However, the environment in which aircraft fly can be physiologically hostile and as a consequence adverse medical and physiological influences may be exerted upon those exposed to it. Aviation and Space Medicine is the study of all factors affecting the human body in flight, in health as well as sickness and the means by which those flying may be protected against the potentially harmful effects of their abnormal environment.

The history of Aviation and Space Medicine has been closely related to the identification and understanding of the medical and physiological hazards of flight and with the development of suitable countermeasures to address them. Developments that may have first gained prominence in high performance aircraft have, not uncommonly, then transferred to civilian air operations to the benefit of the much larger populations involved in this form of flying.

For many years the UK has enjoyed a unique international position, with a proven record of achievement in the field of Aviation and Space Medicine research. UK doctors trained in the speciality have made hugely significant contributions to research, teaching and the practice of Aviation and Space Medicine. This capability has been of crucial importance to the development of safe and reliable world-wide air travel and has also been a very significant contributor to the economically crucial UK aviation industry, including airlines, aircraft manufacturers and life support system designers.

To be able to make such contributions it is essential that practitioners in Aviation and Space Medicine be trained in a number of interrelated disciplines. These doctors must be able to understand, and indeed conduct, human clinical and/or physiological research, train junior doctors in the speciality and be able to respond to clinical referrals and requests for opinions in the context of the aviation environment. It is vital, therefore, that the aviation physician be able to liaise closely and authoritatively with both his clinical and physiological research co-workers and be able to act as an expert on the medical aspects of aviation.

To address the needs and to ensure the availability within the UK of a cadre of practitioners suitably trained and experienced in Aviation and Space Medicine at its highest level, able to provide appropriate advice and direction for the research and practice of the discipline, a training curriculum for higher specialist training has been developed. The programme puts in place a structure which builds on many years of experience of training Consultants in Aviation and Space Medicine in the Royal Air Force, but is structured so that trainees will be equipped with the knowledge and skill-sets demanded by working in both the civilian and military aviation environments. The training is open to all candidates who meet the requirements as laid down below.

## **2 Rationale**

### **2.1 Purpose of the curriculum**

The purpose of this curriculum is to define the process of training and the competencies needed for the award of a certificate of completion of training (CCT) in Aviation and Space Medicine and to be registered on the specialist register.

Most Aviation and Space Medicine physicians practice as general Aviation and Space Medicine physicians, but may work exclusively in the military or civilian environment.. Some consultant Aviation and Space Medicine physicians practice as specialists and limit their clinical practice to a greater or lesser degree to their own clinical subspecialties. They provide specialised care and have appropriate skills and resources in a unit that provides specialist technical and clinical support. The curriculum enables trainees who wish to develop a special interest to do so, but it is expected that in future it will be possible to undertake post CCT/CST credentialing to develop further specialist skills.

## **2.2 Development**

This curriculum was developed by a group of senior Aviation and Space Medicine physicians from the civil and military environment and the Specialty Advisory Committee for Aviation and Space Medicine under the direction of the Joint Royal Colleges of Physicians Training Board (JRCPTB). The members of the curriculum development group have broad UK representation and include trainees and laypersons as well as consultants who are actively involved in teaching and training (Appendix A). This curriculum was developed from previous training schemes for Aviation Medicine trainees in the military, together with elements from previous occupational medicine training requirements for Civil Aviation Authority and Airline medical practitioners. Additionally, a competency based analysis of the skill requirements for Aviation and Space Medicine practitioners also fed into the curriculum's development and content. The curriculum meets GMC's '*Standards for Curricula and Assessment*', and has taken into consideration new developments in the specialty and recent changes in training and assessment. In particular, the curriculum takes into account the possible training approaches from the Shape of Training Review, however there will be further development, alongside all physicianly specialties, to develop an outcomes-based curriculum incorporating the GMC's Generic Professional Capabilities. This curriculum does incorporate generic, leadership and health inequalities competencies.

The curriculum has been circulated within the Aviation and Space Medicine profession for comment. Aviation and Space Medicine physicians, at both consultant and trainee level, (the RAF has existing Aviation and Space Medicine trainees) were given an opportunity to comment on the contents of this curriculum including areas of training and the assessment methods.

This curriculum is trainee-centred and outcome-based, and a spiral approach has been embraced. A spiral curriculum describes a learning experience that revisits topics and themes, each time expanding the sophistication of the knowledge, attitudes and decision-making regarding that topic. This approach aids reinforcement of principles, the integration of topics, and the achievement of higher levels of competency. This revisiting of topics is key to ensuring deep learning. This principle underpins the ethos of a spiral curriculum and effective life-long learning beyond specialty training. In this way an individual progresses from being 'competent' to becoming 'expert'.

## **2.3 Training Pathway**

Specialty training in Aviation and Space Medicine consists of core and higher specialist training. Core training provides physicians with the ability to investigate, treat and diagnose patients with acute and chronic medical symptoms; and with high quality review skills for managing patients in hospitals and in the community. Higher specialist training then builds on these core skills to develop the specific

competencies required to practise independently as an Aviation and Space Medicine specialist.

The core training curricula; Core Medical Training (CMT) or Acute Care Common Stem Medicine – Acute Medicine (ACCS-AM), follow on from the Foundation Curriculum. Completion of core training will be evidenced by satisfactory:

- Foundation competences
- Completion of CMT or ACCS-AM (this may include Broad Based Training)

Assessments to ensure completion of CMT or ACCS will include success in the full MRCP(UK).

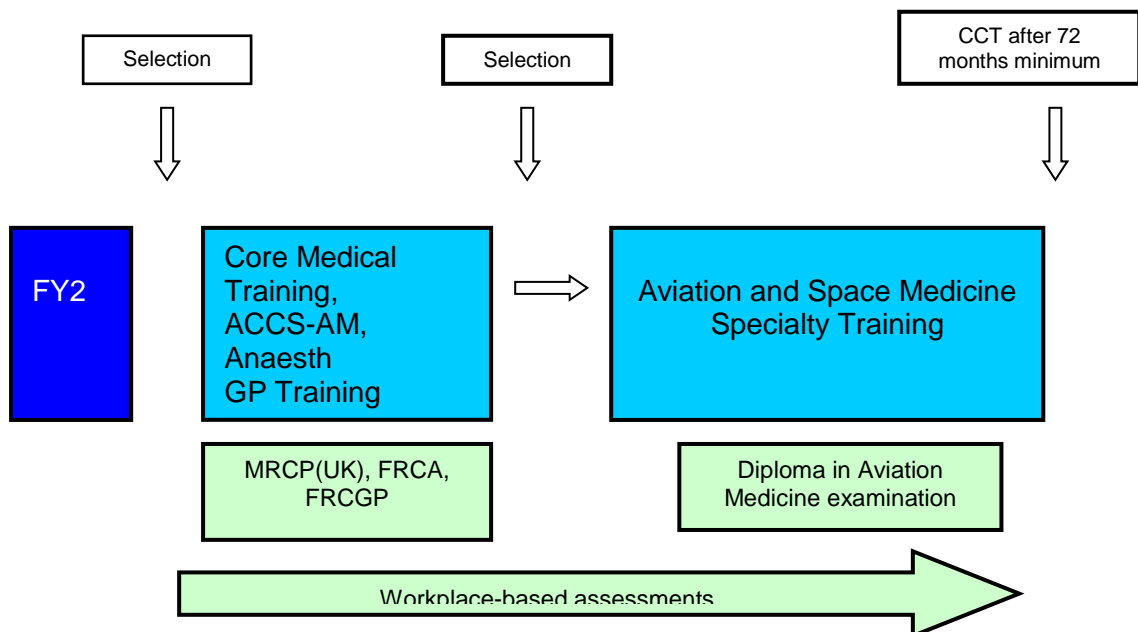
Doctors who have undertaken alternative career pathways, including general practice and core training in anaesthetics, will also be eligible to apply for higher specialty training. Doctors entering from this route will have training needs analysis following appointment to determine whether they need tailored training to ensure their competencies in managing patients are at a level equivalent to the experience gained in CMT or ACCS-AM.

Doctors who have not completed CMT/ACCS-AM must therefore meet the following criteria:

- Satisfactory completion of early years of training in Anaesthetics and success in the FRCA, or
- Satisfactory completion of General Practice training including the MRCGP (this may include Broad Based Training)

Doctors will then undergo selection into Aviation and Space Medicine specialty training using a nationally agreed person specification.

**Figure 1 shows the training pathway for Aviation and Space Medicine**



## **2.4 Enrolment with JRCPTB**

Trainees are required to register for specialist training with JRCPTB at the start of their training programmes. Enrolment with JRCPTB, including the complete payment of enrolment fees, is required before JRCPTB will be able to recommend trainees for a CCT. Trainees can enrol online at [www.jrcptb.org.uk](http://www.jrcptb.org.uk)

## **2.5 Duration of training**

Although this curriculum is competency based, the SAC has advised that training from ST1 will usually be completed in 6 years in full time training (2 years core training plus 4 years specialty training).

The specialty registrar trainee will acquire extensive research competencies and an ideal way to gain these competencies is to undertake a research project within an appropriate setting and with appropriate supervision. Trainees may consider using this period of research as the first stage of undertaking a specific research degree. In such cases trainees should consider taking time out of programme to complete a specified project or research degree.

## **2.6 Less than Full Time Training (LTFT)**

Trainees who are unable to work full-time are entitled to opt for less than full time training programmes. EC Directive 2005/36/EC requires that:

- LTFT shall meet the same requirements as full-time training, from which it will differ only in the possibility of limiting participation in medical activities.
- The competent authorities shall ensure that the competences achieved and the quality of part-time training are not less than those of full-time trainees.

The above provisions must be adhered to. LTFT trainees should undertake a pro rata share of the out-of-hours duties (including on-call and other out-of-hours commitments) required of their full-time colleagues in the same programme and at the equivalent stage.

EC Directive 2005/36/EC states that there is no longer a minimum time requirement on training for LTFT trainees. In the past, less than full time trainees were required to work a minimum of 50% of full time. With competence-based training, in order to retain competence, in addition to acquiring new skills, less than full time trainees would still normally be expected to work a minimum of 50% of full time. If you are returning or converting to training at less than full time please complete the LTFT application form on the JRCPTB website [www.jrcptb.org.uk](http://www.jrcptb.org.uk).

Funding for LTFT is from LETBs/deaneries and these posts are not supernumerary. Ideally therefore 2 LTFT trainees should share one post to provide appropriate service cover.

Less than full time trainees should assume that their clinical training will be of a duration pro-rata with the time indicated/recommended, but this should be reviewed during annual appraisal.

## 3 Content of learning

### 3.1 Programme content and objectives

The structure of the training will involve two fundamental elements: Core Aviation and Space Medicine and Aviation and Space Medicine research which could involve the trainee having the opportunity for studying for a higher research degree. The Core Aviation and Space Medicine curriculum is programmed to run over four years with the research element running concurrently with the Core Aviation and Space Medicine. The award of the CCT will be dependent on the trainee having completed to a satisfactory level the Aviation and Space Medicine training requirements.

### 3.2 Good Medical Practice

Good medical practice is the GMC's core guidance for doctors. It sets out the values and principles on which good practice is founded.

The guidance is divided into the following four domains:

1. Knowledge, skills and performance
2. Safety and quality
3. Communication, partnership and teamwork
4. Maintaining trust

Good medical practice is supported by a range of explanatory guidance which provides more detail on various topics that doctors and others ask us about. The "GMP" column in the syllabus defines which of the 4 domains of Good Medical Practice are addressed by each competency.

### 3.3 Syllabus

In the tables below, the "Assessment Methods" shown are those that are appropriate as **possible** methods that could be used to assess each competency. It is not expected that all competencies will be assessed and that where they are assessed not every method will be used. See section 5.2 for more details.

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# GOOD CLINICAL PRACTICE

## 1. History, Examination, Investigation, and Record Keeping Skills

### Nature of disease and its effect in aviation

<b>To progressively develop the ability to obtain a relevant focussed history from increasingly complex patients and challenging circumstances.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Define the patterns of symptoms found in patients presenting with disease, and how these are related to aviation environment.	mini-CEX, CbD, MCR	1
Define the clinical signs found in diseases.	mini-CEX, CbD, MCR	1
<b>Skills</b>		
Take and analyse a clinical and occupational (aviation) history in a relevant, succinct and systematic manner.	mini-CEX, CbD, MCR	1
Perform a reliable and appropriate examination.	mini-CEX, CbD, DOPS, MCR	1
Record concisely, accurately, confidentially and legibly all medical records, and date and sign all records.	mini-CEX, CbD, MCR	1
<b>Behaviours</b>		
Show empathy with and listen to patients.	mini-CEX, PS, MCR	1,3
Appreciate the importance and interaction of psychological and social factors in patient's disease and illness behaviour.	mini-CEX, PS, MCR	1,3
Respect patient's dignity and confidentiality.	mini-CEX, PS, MCR	1,3,4
Show empathy with and listen to patients.	mini-CEX, PS, MCR	1,3,4

### Disease pathology

<b>To progressively develop the ability to define and understand the pathophysiological basis of physical signs relevant to aviation and functional prognosis.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Define the pathophysiological basis of physical signs.	mini-CEX, CbD, MCR	1
Define the pathophysiological basis of investigations, including those relevant to aviation, and functional prognosis.	mini-CEX, CbD, MCR	1
<b>Skills</b>		
Interpret the results of investigations, especially to those relating to occupational attribution, functional prognosis and to licensing gain/retention.	mini-CEX, CbD, MCR	1
<b>Behaviours</b>		
Show a willingness to provide explanation to the patient as to rationale for investigations, and possible unwanted effects.	mini-CEX, PS, MCR	1,3

## Disease investigation

**To record accurately and synthesise history with clinical examination and formulation of an investigatory management plan according to likely clinical evolution.**

<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Define the indications for investigations.	mini-CEX, CbD, MCR	1
Define the risks and benefits of investigations.	mini-CEX, CbD, MCR	1
Outline the cost effectiveness of individual investigations.	mini-CEX, CbD, MCR	1
<b>Skills</b>		
Perform investigations competently where relevant.	mini-CEX, CbD, MCR	1
Liaise and discuss investigations with colleagues and to order them appropriately.	mini-CEX, CbD, MCR	1
<b>Behaviours</b>		
Understand the importance of multidisciplinary team working in all aspects of patient care.	mini-CEX, CbD, MSF, MCR	1,3
Show an understanding of the role of and respect for other health care staff.	mini-CEX, CbD, MSF, MCR	1,3

## 2. Clinical Assessment for Fitness to Fly: Evidenced Based National and International Regulation

### Clinical condition and aircrew licensing certification

<b>To progressively develop the ability to perform medicals on aircrew and other aviation workers and define and understand the clinical standards of licensing requirements.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Define the clinical standards of licensing requirements.	mini-CEX, CbD, DAvMed, MCR	1,2,4
Understand the clinical conditions which define the licensing requirements.	mini-CEX, CbD, DAvMed, MCR	1,2,4
Understand the clinical conditions and their effect in the flight environment.	mini-CEX, CbD, DAvMed, MCR	1
<b>Skills</b>		
Certification of individuals within the medical standards necessary to achieve and maintain a high level of aviation safety.	mini-CEX, CbD, MCR	1,2
Perform medicals on aircrew and other aviation workers including air traffic controllers to ensure individuals are medically fit and reach the required medical standards.	mini-CEX, CbD, MCR	1,2,4
Issue or revoke aircrew and air traffic controller's certificates to ensure medical standards are maintained.	mini-CEX, CbD, MCR	1,2
<b>Behaviours</b>		
Be responsible for identifying the clinical condition and licensing implications and take responsibility for these.	mini-CEX, CbD, PS, MCR	1,2

### Clinical research and aircrew licensing

<b>To progressively develop the ability to understand the requirements of aviation medical regulation and the implications of clinical conditions on the setting of regulatory policies.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Understand the requirements of aviation regulatory bodies and the implications of clinical conditions on the setting of regulatory policies.	mini-CEX, CbD, DAvMed, AA, MCR	1,2
<b>Skills</b>		
Undertake research in response to any medical directives, issues or concerns raised by the legal, political or media professions.	mini-CEX, CbD, AA, MCR	1,2
Contribute to the development of new policy or policy changes as a result of the research findings and resulting required action to ensure the policy is kept up-to-date.	mini-CEX, CbD, AA, MCR	
Publish and communicate internally and externally the results of research undertaken, to respond to and raise awareness of issues or directives.	mini-CEX, AA, MCR	1,2,3
Provide clear guidance on how to apply for, or renew, Certificates, and Licences.	mini-CEX, CbD, MCR	1,2
<b>Behaviours</b>		
Respond to enquiries efficiently and meet deadlines.	mini-CEX, CbD, MCR	1,3

Deliver accurate and scientifically sound research	mini-CEX, MCR	1,2
Demonstrate curiosity and a critical spirit of enquiry	mini-CEX, CbD, MCR	1,2
Demonstrate the persistence needed to follow a project from inception to completion.	mini-CEX, CbD, MCR	1,2
Ensure patient confidentiality.	mini-CEX, PS, MCR	1,2,4
Demonstrate knowledge of the importance of ethical approval and patient consent for clinical research.	mini-CEX, PS, MCR	1,2

### Licensing and regulatory decision making

<b>To progressively develop the ability to make judgments on clinical conditions to inform licensing and regulatory decision making.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Evidence based literature review to inform licensing and regulatory decision making.	mini-CEX, CbD, MCR	1,2
Understand how to effect policy changes at national and international level.	mini-CEX, CbD, DAvMed, MCR	1
<b>Skills</b>		
Carry out literature review and make appropriate recommendations regarding licensing and regulatory policy decisions based on evaluation of clinical research.	mini-CEX, CbD, MCR	1
<b>Behaviours</b>		
Demonstrate willingness to research clinical policy decision making and be effective in taking clinical evidence through to licensing and regulatory changes.	mini-CEX, CbD, MCR	1

### Medical review procedure

<b>To progressively develop the ability to review clinical conditions to inform regulatory decision making.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Understand the clinical conditions requiring secondary review procedures.	mini-CEX, CbD, DAvMed, MCR	1
Knowledge of the limitations of statutory regulation on some clinical conditions.	mini-CEX, CbD, DAvMed, MCR	1
<b>Skills</b>		
Liaise with specialist consultant advisors and prepare medical case presentations for secondary review procedures.	mini-CEX, CbD, MCR	1,3
Demonstrate currency in advances in medicine which may allow people to start or continue flying or air traffic controlling who would previously have been barred.	mini-CEX, CbD, MCR	1,2
<b>Behaviours</b>		
Apply sound clinical judgement to the review procedures.	mini-CEX, CbD, MCR	1,2
Demonstrate the importance of effective multidisciplinary team work and effective communication with colleagues and patients both verbally and in writing.	mini-CEX, CbD, MSF, MCR	1,3



Demonstrate the importance of involvement of other professionals in the assessment and management complex medical licensing issues.	mini-CEX, CbD, MSF, MCR	1,2,3,4
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## Passenger and crew health

<b>To progressively develop the ability to assess the effects of travelling by air on health.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Knowledge of the effects on health of travelling by air.	mini-CEX, CbD, DAvMed, MCR	1
Understand the importance of risk assessment to ensure those with medical conditions are fit to fly on commercial aircraft	mini-CEX, CbD, DAvMed, MCR	1,2
Knowledge of research and other relevant information on aviation health and to set priorities for areas which require further attention.	mini-CEX, CbD, DAvMed, MCR	1
<b>Skills</b>		
Be able to provide advice on passenger and crew health issues including; deep venous thrombosis, cabin air quality, transmission of infection, cosmic radiation and the provision of information.	mini-CEX, CbD, DAvMed, MCR	1,2
Monitor and develop practices and procedures on passenger and crew health.	mini-CEX, CbD, DAvMed, MCR	1,2
Examine how the arrangements for safeguarding the health of passengers and crew keep pace with developing medical and technical knowledge.	mini-CEX, CbD, DAvMed, MCR	1,2
<b>Behaviours</b>		
Propose improvements not only in the regulatory arrangements but also in the information available to intending air travellers.	mini-CEX, CbD, MCR	1,2

## Flight deck and aviation environment

<b>To progressively develop the ability to 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.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Acquisition of practical knowledge and experience of the conditions in which flight deck crew and other operators, including air traffic control workers, carry out their duties.	CbD, DAvMed, MCR	1
<b>Skills</b>		
Be able to demonstrate a sound knowledge of the conditions in which flight deck crew and other operators carry out their duties.	CbD, DAvMed, MCR	1
Experience of the flight deck through time on simulators or actual flights, DFT regulations permitting, is highly desirable as from 2012 EASA Basic Regulation (EC Regulation 216/2008) will be enacted.	CbD, DAvMed, MCR	1
Experience of the working environment for air traffic controller workers.	CbD, DAvMed, MCR	1
<b>Behaviours</b>		
Demonstrate the importance of a comprehensive knowledge and understanding of the working environment of aviation workers.	CbD, MSF, MCR	1

Ability to empathise with aviation workers and to appreciate the significance of any licensing or medical limitations to their careers.

CbD, MSF, PS, MCR 1

### 3. General Principles of Assessment & Management of Hazards and Risk to Health in the Aviation Workplace

#### Health hazards

**To progressively develop the ability to understand and assess hazards to health in the aviation environment and workplace, and the illnesses, which they cause.**

<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Understand the physical, chemical, biological, ergonomic, psychosocial and other hazards to health in the workplace, and the illnesses, which they cause.	mini-CEX, CbD, DAvMed, MCR	1,2
Understand the principles of toxicology, physical (including thermal, noise, vibration and radiation) hazards, occupational hygiene and ergonomics.	mini-CEX, CbD, DAvMed, MCR	1,2
Know about the clinical features and investigation of occupational diseases relevant to aviation.	mini-CEX, CbD, DAvMed, MCR	1,2
Know about the emergency treatment of acute poisoning, physical and other injury at work.	mini-CEX, CbD, DAvMed, MCR	1,2
<b>Skills</b>		
Undertake assessments of working environment, recognise hazards, and provide preliminary advice.	mini-CEX, CbD, DOPS, MCR	1,2
Undertake quantitative measurements, and advise on control measures for hazards in flight.	mini-CEX, CbD, DOPS, MCR	1,2
Recognise situations where specialist assessment of the aviation environment is needed and be able to seek and evaluate advice.	mini-CEX, CbD, DOPS, MCR	1,2
Diagnose work related ill health and provide advice on prognosis, prevention and management.	mini-CEX, CbD, MCR	1,2
Customise assessments to subgroups (such as pregnant women) and to individuals.	mini-CEX, CbD, DOPS, MCR	1,2
<b>Behaviours</b>		
A commitment to liaison with safety representatives, safety officers, occupational hygienists, ergonomists and other specialists in the assessment of aviation workplace environments.	mini-CEX, CbD, MSF, PS, MCR	1,2,3

#### Risk

**To progressively develop the ability to assess health risk in the aviation environment and demonstrate a commitment to improving aviation safety.**

<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Understand the sources of information on and methods of evaluating	mini-CEX, CbD,	1,2

and controlling risk.	DAvMed, MCR	
Understand the principles of health risk management in the aviation environment.	mini-CEX, CbD, DAvMed, MCR	1,2
<b>Skills</b>		
Evaluate the implementation of health risk management in the aviation workplace.	mini-CEX, CbD, DOPS, MCR	1,2,3
Carry out and evaluate health surveillance including biological monitoring for workers exposed to hazards on the ground or in the air.	mini-CEX, CbD, DOPS, MCR	1,2,3
<b>Behaviours</b>		
A commitment to reducing risk and improving in flight safety.	mini-CEX, CbD, MSF, MCR	1,2,3

## Health standards

**To progressively develop the ability to evaluate and advise on health surveillance and effective health intervention in the aviation environment.**

	<b>Assessment Methods</b>	<b>GMP</b>
<b>Knowledge</b>		
Understand occupational health standards, biological monitoring and the principles of health surveillance.	mini-CEX, CbD, DAvMed, MCR	1,2
<b>Skills</b>		
Evaluate and advise on first aid facilities in the workplace.	mini-CEX, CbD, DOPS, MCR	1,2
Negotiate effective health interventions in the aviation environment.	mini-CEX, CbD, DOPS, MCR	1,2
<b>Behaviours</b>		
A commitment to health promotion.	mini-CEX, CbD, MSF, PS, MCR	1,2,3

## 4. Aeromedical In-Flight Assessment and Rehabilitation

### Role of flight assessment, research and rehabilitation in Aviation and Space Medicine

<b>To progressively develop the ability to carry out in-flight medical assessments and investigations and how these may contribute to aero-medical decision making.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Understand the limitations of ground based clinical assessments, equipment investigation and research.	mini-CEX, CbD, DAvMed, MCR	1
Understand how in-flight investigation may contribute to aero-medical decision making, formal equipment clearances and clinical fitness to fly judgements.	mini-CEX, CbD, DAvMed, MCR	1
Be familiar with the use of in-flight clinical rehabilitation.	mini-CEX, CbD, DAvMed, MCR	1
<b>Skills</b>		
Determine areas of investigation that require in-flight assessment, or conditions where in-flight rehabilitation is justified and cost effective.	mini-CEX, CbD, DOPS, MCR	1,2
<b>Behaviours</b>		
Recognise the valuable contribution that in-flight assessment and rehabilitation offers, and the potential for error without consideration of in-flight factors.	mini-CEX, CbD, MCR	1
Be aware of the cost-benefits of aircraft utilisation.	mini-CEX, CbD, MCR	1

### Protocols for in-flight assessment and rehabilitation

<b>To progressively develop the ability to use the flight environment for research or rehabilitation and understand how to use the aircraft as a tool safely and effectively.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Have a thorough understanding of the flight environment, and the limitations involved with conducting such work on board aircraft.	mini-CEX, CbD, DAvMed, MCR	1,2
Be aware of all appropriate regulations.	mini-CEX, CbD, DAvMed, MCR	1,2
<b>Skills</b>		
Write flight protocols, in conjunction with experienced aircrew, for in-flight assessment, research or rehabilitation using skills and knowledge acquired from all aspects of Aviation and Space Medicine practice.	mini-CEX, CbD, DOPS, MCR	1,2
<b>Behaviours</b>		
Understand how to use the aircraft as a tool safely and effectively.	mini-CEX, CbD, MCR	1,2

## Clinical and physiological monitoring in flight

<b>To progressively develop the ability to carry out in flight clinical and physiological monitoring.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Understand the various modalities of clinical and physiological monitoring that may be used in flight, and their principal limitations.	mini-CEX, CbD, DAvMed, MCR	1
Understand how monitoring can be integrated with aircraft systems to ensure there is no impact on flight safety or escape systems.	mini-CEX, CbD, DAvMed, MCR	1
<b>Skills</b>		
Demonstrate an understanding of the physiological principles underlying monitoring techniques used.	mini-CEX, CbD, DOPS, MCR	1
Describe the most appropriate parameters to be monitored and be familiar with the limitations.	mini-CEX, CbD, DOPS, MCR	1,2
Identify typical sources of error, and the problems associated with in-flight instrumentation.	mini-CEX, CbD, DOPS, MCR	1,2
<b>Behaviours</b>		
Provide an impartial assessment based on rigorous scientific methods, to enable evidence based decisions based on an accurate representation of the aircrew working environment to be made.	mini-CEX, CbD, MCR	1,2

## Reporting of findings

<b>To progressively develop the ability to report the findings of clinical and aircrew and passenger equipment assessments.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Have knowledge of aircrew and passenger equipment procurement organisations and responsible bodies.	mini-CEX, CbD, DAvMed, MCR	1,2
Understand appropriate format and channels for reporting.	mini-CEX, CbD, DAvMed, MCR	1,3
<b>Skills</b>		
Write a report based on the findings of the assessment, with recommendations.	mini-CEX, CbD, DOPS, MCR	1,3
Produce finished reports in a timely way.	mini-CEX, CbD, DOPS, MCR	1,3
Produce reports to a high standard of clarity and accuracy, comparable with those in peer reviewed scientific literature.	mini-CEX, CbD, DOPS, MCR	1,3
<b>Behaviours</b>		
Provide a sound basis for financial and policy decisions relating to aircrew life support systems, and aircrew health issues.	mini-CEX, CbD, MSF, MCR	1,3

## 5. Assessment of Disability and Fitness for Work

### Evaluation of fitness for work

<b>To progressively develop the ability to perform clinical assessment of disability and fitness for work and understand the principles of assessing fitness for work in aviation.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Understand the principles of assessing fitness for work and the statutory requirements of fitness for specific aviation jobs.	mini-CEX, CbD, DAvMed, MCR	1,2
Understand the principles and practice of rehabilitation and redeployment at work.	mini-CEX, CbD, DAvMed, MCR	1,2,3
Understand the principles and practice of ergonomics as applied to job task adjustment.	mini-CEX, CbD, DAvMed, MCR	1,2,3
<b>Skills</b>		
Perform clinical assessment of disability and fitness for work at pre-employment and post illness.	mini-CEX, CbD, DOPS, MCR	1,2,3
Injury and recognise the importance of assessing all relevant systems.	mini-CEX, CbD, DOPS, MCR	1,2,3
Assess capability for work in those with a disablement/impairment.	mini-CEX, CbD, DOPS, MCR	1,2,3
Manage cases suitable for rehabilitation, resettlement and/or relicensing.	mini-CEX, CbD, DOPS, MCR	1,2,3
<b>Behaviours</b>		
Work in conjunction with professional colleagues and other advisors.	mini-CEX, CbD, MSF, MCR	1,2,3

### Disability legislation

<b>To progressively develop the ability to advise on impairment, disability, fitness for work, rehabilitation and redeployment.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Understand the individual and general factors affecting sickness absence.	mini-CEX, CbD, DAvMed, MCR	1,3,4
Understand the principles of social welfare and other disability benefits.	mini-CEX, CbD, DAvMed, MCR	1,3,4
Have a knowledge of ill health retirement and pension scheme functioning.	mini-CEX, CbD, DAvMed, MCR	1,3
Understand the impact, scope and application of Disability Legislation in the workplace.	mini-CEX, CbD, DAvMed, MCR	1,3,4
<b>Skills</b>		
Advise on impairment, disability, fitness for work, rehabilitation and redeployment.	mini-CEX, CbD, MCR	1,2,4
Liaise with other health professionals in assessing capability for work in the aviation environment.	mini-CEX, CbD, MCR	1,2,3
Advise on sickness absence, ill health retirement and licensing changes.	mini-CEX, CbD, MCR	1,2,3

## Behaviours

Work in conjunction with professional colleagues and other advisors.	mini-CEX, Cbd, MSF, MCR	1,2,3
Empathy for potential loss of livelihood.	mini-CEX, Cbd, MSF, PS, MCR	1,2,3,4

## 6. Aviation and Space Medicine Research Projects

### To be able to plan and analyse a research project

<b>To progressively develop the ability to design a research study and to develop protocols and methods for research.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Convert a problem into a researchable question.	CbD, MCR	1
Be able to set up a hypothesis and test it.	CbD, MCR	1
Know how to design a research study.	CbD, MCR	1
Carry out a literature search.	CbD, MCR	1
Plan data collection for simple survey (sample selection and recording and storing data).	CbD, MCR	1
Know how to use appropriate statistical methods and utilise the knowledge of a statistician or epidemiological expert.	CbD, MCR	1
Interpret scientific data in journals and from own research.	CbD, MCR	1
Use a computer for the storage and analysis of data.	CbD, MCR	1
Know the principles of research ethics and the role of ethical committees.	CbD, MCR	1
Report on an investigation orally and in writing.	CbD, TO, MCR	1
Know how to write a scientific paper.	CbD, MCR	1
Know how to identify sources of research funding.	CbD, MCR	1
<b>Skills</b>		
Undertake systematic critical review of scientific literature.	CbD, DOPS, MCR	1
Ability to frame questions to be answered by a research project.	CbD, DOPS, MCR	1
Develop protocols and methods for research.	CbD, DOPS, MCR	1
Obtain ethical committee approval for a research proposal.	CbD, MCR	1
Participate in collaborative research with clinical/scientific colleagues.	CbD, MCR	1
Be able to use databases.	CbD, MCR	1
Be able to accurately analyse data.	CbD, MCR	1
Write and submit a case report or scientific paper.	CbD, MCR	1
Have good written and verbal presentation skills.	CbD, MCR	1,3
<b>Behaviours</b>		
Demonstrate curiosity and a critical spirit of enquiry.	CbD, AA, MCR	1,3
Demonstrate the persistence needed to follow a project from inception to completion.	CbD, MCR	1,3
Ensure patient/subject confidentiality.	CbD, MSF, PS, MCR	1,3
Demonstrate knowledge of the importance of ethical approval and patient consent for clinical research.	CbD, MCR	1,3

### Ethical Research

**To ensure that research is undertaken using relevant ethical guidelines**



<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Outline the GMC guidance on good practice in research.	CbD, MCR	1
Outline the differences between audit and research.	CbD, AA, MCR	1
Describe how clinical guidelines are produced.	CbD, MCR	1
Demonstrate knowledge of research principles.	CbD, MCR	1
Outline the principles of formulating a research question and designing a project.	CbD, MCR	1
Comprehend principal qualitative, quantitative, bio-statistical and epidemiological research methods.	CbD, MCR	1
Outline sources of research funding.	CbD, MCR	1
<b>Skills</b>		
Develop critical appraisal skills and apply these when reading literature.	CbD, MCR	1
Demonstrate the ability to write a scientific paper.	CbD, MCR	1
Apply for appropriate ethical research approval.	CbD, MCR	1
Demonstrate the use of literature databases.	CbD, MCR	1
Demonstrate good verbal and written presentations skills.	CbD, MCR	1
<b>Behaviours</b>		
Recognise the ethical responsibilities to conduct research with honesty and integrity, safeguarding the interests of the patient and obtaining ethical approval when appropriate.	CbD, MCR	1,2,3,4
Follow guidelines on ethical conduct in research and consent for research.	CbD, MCR	1,2,3
Show willingness to the promotion of involvement in research.	CbD, MCR	1,3

## ROLE SPECIFIC COMPETENCIES

### 7. Application of Specialist Competencies in Aviation and Space Medicine

#### Role specific competencies

To progressively develop the ability to understand the determinants of role specific competency and to identify the knowledge and skill gaps pertaining to specific roles in particular aviation environments.		
	Assessment Methods	GMP
Knowledge		
Understand the determinants of role specific competency, especially: types of aviation role (air or ground based), types of jobs and hence 'exposures', demography of workforce, culture within the society, sector, employers and employees.	mini-CEX, CbD, MCR	1
Skills		
To be able to identify the knowledge and skills gaps pertaining to specific roles in particular aviation environments at different levels: Society, the professional specialty, the aviation health service and the individual specialist.	mini-CEX, CbD, MCR	1
To be able to identify steps necessary to fill those gaps.	mini-CEX, CbD, MCR	1
To implement an exemplar activity to fill a role specific knowledge gap (critical literature search and review and/or original research, to contribute to the evidence base).	mini-CEX, CbD, MCR	1
To be able to devise an aviation health service level agreement and personal specification applicable to the specific role.	mini-CEX, CbD, DOPS, MCR	1
Behaviours		
To accept that specialist competencies have to be transferred to specific roles in the light of the underlying context.	mini-CEX, CbD, MCR	1
To accept the need for further personal development in order to fulfil specific roles.	mini-CEX, CbD, MCR	1

## 8. Global Aviation Health

### Aviation health

<b>To progressively develop the ability to shape aviation health practice in the UK and understand how legislation and practice in the UK are influenced by global developments.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Understand the role of the international organisations in shaping aviation health practice in the UK.	mini-CEX, CbD, MCR	1
Understand the organisation of aviation health services across the EU and globally.	mini-CEX, CbD, MCR	1
Understand how legislation and practice in the UK are influenced by global developments.	mini-CEX, CbD, MCR	1,2
Understand the implications for health of global travel and the role of WHO, ILO and other similar bodies.	mini-CEX, CbD, MCR	1
Understand the implications of terrorism and emerging risks to the safety of aviation workers and passengers.	mini-CEX, CbD, MCR	1
<b>Skills</b>		
To advise managers and others of their legal obligations under international directives.	mini-CEX, CbD, DOPS, MCR	1,2,3
To ensure professional practice is compliant with relevant health and safety and employment law.	mini-CEX, CbD, DOPS, MCR	1,2,3
To identify relevant symptoms of disease from employees and passengers returning from foreign travel.	mini-CEX, CbD, DOPS, MCR	1,2,3
To provide appropriate advice to travellers on health and safety.	mini-CEX, CbD, DOPS, MCR	1,2,3
<b>Behaviours</b>		
Respond appropriately to cultural differences in health promotion and disease management.	mini-CEX, CbD, MCR	1,2,3
Enthusiasm to develop new skills relevant to the changing needs of aviation health.	mini-CEX, CbD, MCR	1,2,3
Keep updated on government guidance on health impacts related to global threats to health and safety.	mini-CEX, CbD, MCR	1,2,3

## 9. Clinical Presentations and Aeromedical Disposition

### Cardiovascular disease

<b>The trainee will be able to assess a patient with cardiovascular disease to produce a valid differential diagnosis, investigate appropriately, and formulate and implement an aeromedical management plan.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Understand the clinical presentation, signs, symptoms, pathology, prognosis and treatment regimes for the main cardiovascular diseases including: <ul style="list-style-type: none"> <li>• coronary artery disease</li> <li>• rate and rhythm disturbances</li> <li>• conduction disturbances</li> <li>• valvular disease</li> <li>• pericarditis</li> <li>• myocarditis</li> <li>• endocarditis</li> <li>• cardiomyopathy</li> <li>• congenital heart disease</li> <li>• ion channelopathies</li> <li>• peripheral</li> <li>• great vessel disease, hypertension</li> </ul>	CbD, mini-CEX, DAVMed, MCR	1
Understand how these clinical presentations can influence licensing decisions, future/continued employment and passenger travel.	CbD, mini-CEX, DAVMed, MCR	1
<b>Skills</b>		
Ability to assess a patient with cardiovascular disease and implement a management plan in conjunction with cardiovascular specialists.	CbD, mini-CEX, MCR	1
Interpret the history and clinical signs to list appropriate differential diagnoses.	CbD, mini-CEX, MCR	1
Order, interpret and act on initial investigations and know when to refer patient/aviation workers for further management.	CbD, mini-CEX, MCR	1,2
Ability to interpret clinical finding with regard to licensing, future/continued employment and passenger travel.	CbD, mini-CEX, MCR	1,2
<b>Behaviours</b>		
Be responsible for identifying the clinical condition and licensing implications and take responsibility for these.	CbD, MSF, PS, MCR	1,2
Recognise the contribution and expertise of cardiology specialists.	CbD, MSF, PS, MCR	1
Communicate in a timely and thoughtful way with patients/aviation workers.	CbD, MSF, PS, MCR	1,3
Show empathy to patients and aviation workers regarding licensing decisions and future/continued employment.	CbD, MSF, PS, MCR	1,2,3,4

### Respiratory disease

**The trainee will be able to assess a patient with respiratory disease to produce a valid differential diagnosis, investigate appropriately, and formulate and implement an aeromedical management plan.**

	Assessment Methods	GMP
<b>Knowledge</b>		
Understand the clinical presentation, signs, symptoms, pathology, prognosis and treatment regimes for the main respiratory diseases including: asthma, sarcoidosis, pneumothorax, bullous lung disease and cysts, obstructive sleep apnoea, chronic obstructive lung disease, bronchiectasis, pulmonary tuberculosis and mycobacterial disease, interstitial lung disease, pulmonary thromboembolic disease, pulmonary malignancies.	CbD, mini-CEX, DAvMed, MCR	1
Understand how these clinical presentations can influence licensing decisions, future/continued employment and passenger travel.	CbD, CEX, DAvMed, MCR	1
<b>Skills</b>		
Ability to assess a patient with respiratory disease and implement a management plan in conjunction with respiratory disease specialists.	CbD, mini-CEX, DOPS, MCR	1,3
Interpret the history and clinical signs to list appropriate differential diagnoses.	CbD, mini-CEX, MCR	1
Order, interpret and act on initial investigations and know when to refer patient/aviation workers for further management.	CbD, mini-CEX, MCR	1,2
Ability to interpret clinical finding with regard to licensing, future/continued employment and passenger travel.	CbD, mini-CEX, MCR	1,2
<b>Behaviours</b>		
Be responsible for identifying the clinical condition and licensing implications and take responsibility for these.	CbD, mini-CEX, MSF, PS, MCR	1,2
Recognise the contribution and expertise of respiratory disease specialists.	CbD, mini-CEX, MSF, MCR	1,2,3
Communicate in a timely and thoughtful way with patients/aviation workers.	CbD, mini-CEX, MSF, PS, MCR	1,2,3,4
Show empathy to patients and aviation workers regarding licensing decisions and future/continued employment	CbD, mini-CEX, MSF, PS, MCR	1,2,3,4

## Gastrointestinal disease

**The trainee will be able to assess a patient with gastrointestinal disease to produce a valid differential diagnosis, investigate appropriately, and formulate and implement an aeromedical management plan.**

	Assessment Methods	GMP
<b>Knowledge</b>		
Understand the clinical presentation, signs, symptoms, pathology, prognosis and treatment regimes for the main gastrointestinal diseases including: gastro-oesophageal reflux disease, peptic ulcer disease, inflammatory bowel disease, irritable bowel syndrome, coeliac disease, travellers' gastrointestinal infections, liver disease, gallstones, and pancreatitis.	CbD, mini-CEX, DAvMed, MCR	1
Understand how these clinical presentations can influence licensing decisions, future/continued employment and passenger travel.	CbD, mini-CEX, DAvMed, MCR	1
<b>Skills</b>		
Ability to assess a patient with gastrointestinal disease and implement a management plan in conjunction with gastrointestinal disease	CbD, mini-CEX, MCR	1,3

specialists.			
Interpret the history and clinical signs to list appropriate differential diagnoses.	CbD, mini-CEX, MCR	1	
Order, interpret and act on initial investigations and know when to refer patient/aviation workers for further management.	CbD, mini-CEX, MCR	1,2	
Ability to interpret clinical finding with regard to licensing, future/continued employment and passenger travel.	CbD, mini-CEX, MCR	1,2	
<b>Behaviours</b>			
Be responsible for identifying the clinical condition and licensing implications and take responsibility for these.	CbD, mini-CEX, MCR	1,2	
Recognise the contribution and expertise of gastrointestinal disease specialists.	CbD, mini-CEX, MSF, MCR	1,2,3	
Communicate in a timely and thoughtful way with patients/aviation workers.	CbD, mini-CEX, MSF, PS, MCR	1,2,3,4	
Show empathy to patients and aviation workers regarding licensing decisions and future/continued employment.	CbD, mini-CEX, MSF, PS, MCR	1,2,3,4	

## Metabolic and endocrine diseases

<b>The trainee will be able to assess a patient with metabolic and endocrine diseases to produce a valid differential diagnosis, investigate appropriately, and formulate and implement an aeromedical management plan.</b>			
	<b>Assessment Methods</b>	<b>GMP</b>	
<b>Knowledge</b>			
Understand the clinical presentation, signs, symptoms, pathology, prognosis and treatment regimes for the main metabolic and endocrine diseases including: diabetes, disorders of the pituitary, thyroid, adrenal glands, calcium metabolism, disturbances of lipid metabolism.	CbD, mini-CEX, DAVMed, MCR	1	
Understand how these clinical presentations can influence licensing decisions, future/continued employment and passenger travel.	CbD, mini-CEX, DAVMed, MCR	1	
<b>Skills</b>			
Ability to assess a patient with metabolic and endocrine disease and implement a management plan in conjunction with diabetologists and endocrinologists.	CbD, mini-CEX, MCR	1,3	
Interpret the history and clinical signs to list appropriate differential diagnoses.	CbD, mini-CEX, MCR	1	
Order, interpret and act on initial investigations and know when to refer patient/aviation workers for further management.	CbD, mini-CEX, MCR	1,2	
Ability to interpret clinical finding with regard to licensing, future/continued employment and passenger travel.	CbD, mini-CEX, MCR	1,2	
<b>Behaviours</b>			
Be responsible for identifying the clinical condition and licensing implications and take responsibility for these.	CbD, mini-CEX, MCR	1,2	
Recognise the contribution and expertise of diabetologists and endocrinologists.	CbD, mini-CEX, MSF, MCR	1,2,3	
Communicate in a timely and thoughtful way with patients/aviation workers.	CbD, mini-CEX, MSF, PS, MCR	1,2,3,4	

Show empathy to patients and aviation workers regarding licensing decisions and future/continued employment	CbD, mini-CEX, MSF, PS, MCR	1,2,3,4
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## Renal disease

<b>The trainee will be able to assess a patient with renal disease to produce a valid differential diagnosis, investigate appropriately, and formulate and implement an aeromedical management plan.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Understand the clinical presentation, signs, symptoms, pathology, prognosis and treatment regimes for the main renal diseases including: haematuria, proteinuria, renal stone disease, chronic renal failure, benign prostatic hypertrophy, renal and bladder tumours.	CbD, mini-CEX, DAVMed, MCR	1
Understand how these clinical presentations can influence licensing decisions, future/continued employment and passenger travel.	CbD, mini-CEX, DAVMed, MCR	1
<b>Skills</b>		
Ability to assess a patient with renal disease and implement a management plan in conjunction with renal specialists.	CbD, mini-CEX, MCR	1,3
Interpret the history and clinical signs to list appropriate differential diagnoses.	CbD, mini-CEX, MCR	1
Order, interpret and act on initial investigations and know when to refer patient/aviation workers for further management.	CbD, mini-CEX, MCR	1,2
Ability to interpret clinical finding with regard to licensing, future/continued employment and passenger travel.	CbD, mini-CEX, MCR	1,2
<b>Behaviours</b>		
Be responsible for identifying the clinical condition and licensing implications and take responsibility for these.	CbD, mini-CEX, MCR	1,2
Recognise the contribution and expertise of renal disease specialists.	CbD, mini-CEX, MSF, MCR	1,2,3
Communicate in a timely and thoughtful way with patients/aviation workers.	CbD, mini-CEX, MSF, PS, MCR	1,2,3,4
Show empathy to patients and aviation workers regarding licensing decisions and future/continued employment.	CbD, CEX, MSF, PS, MCR	1,2,3,4

## Haematology

<b>The trainee will be able to assess a patient with haematologic disease to produce a valid differential diagnosis, investigate appropriately, and formulate and implement an aeromedical management plan.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Understand the clinical presentation, signs, symptoms, pathology, prognosis and treatment regimes for the main haematological diseases including: anaemia, bleeding disorders, venous thrombosis and anticoagulation, blood transfusion, air travel and DVT, splenectomy.	CbD, mini-CEX, DAVMed, MCR	1
Understand how these clinical presentations can influence licensing decisions, future/continued employment and passenger travel.	CbD, mini-CEX, DAVMed, MCR	1
<b>Skills</b>		

Ability to assess a patient with haematological disease and implement a management plan in conjunction with haematologists.	CbD, mini-CEX, MCR	1,3
Interpret the history and clinical signs to list appropriate differential diagnoses.	CbD, mini-CEX, MCR	1
Order, interpret and act on initial investigations and know when to refer patient/aviation workers for further management.	CbD, mini-CEX, MCR	1,2
Ability to interpret clinical finding with regard to licensing, future/continued employment and passenger travel.	CbD, mini-CEX, MCR	1,2
<b>Behaviours</b>		
Be responsible for identifying the clinical condition and licensing implications and take responsibility for these.	CbD, mini-CEX, MCR	1,2
Recognise the contribution and expertise of haematology disease specialists.	CbD, mini-CEX, MSF, MCR	1,2,3
Communicate in a timely and thoughtful way with patients/aviation workers.	CbD, mini-CEX, MSF, PS, MCR	1,2,3,4
Show empathy to patients and aviation workers regarding licensing decisions and future/continued employment.	CbD, mini-CEX, MSF, PS, MCR	1,2,3,4

## Malignant disease

**The trainee will be able to assess a patient with malignant disease to produce a valid differential diagnosis, investigate appropriately, and formulate and implement an aeromedical management plan.**

<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Understand the clinical presentation, signs, symptoms, pathology, prognosis and treatment regimes for the main malignant diseases including: Colorectal carcinoma, Lymphoid malignancies. Melanoma, testicular tumours, renal carcinoma, prostatic tumours, breast carcinoma, lung carcinomas	CbD, mini-CEX, DAvMed, MCR	1
Understand how these clinical presentations can influence licensing decisions, future/continued employment and passenger travel.	CbD, mini-CEX, DAvMed, MCR	1
<b>Skills</b>		
Ability to assess a patient with malignant disease and implement a management plan in conjunction with oncologists and other specialists.	CbD, mini-CEX, MCR	1,3
Interpret the history and clinical signs to list appropriate differential diagnoses.	CbD, mini-CEX, MCR	1
Order, interpret and act on initial investigations and know when to refer patient/aviation workers for further management.	CbD, mini-CEX, MCR	1,2
Ability to interpret clinical finding with regard to licensing, future/continued employment and passenger travel.	CbD, mini-CEX, MCR	1,2
<b>Behaviours</b>		
Be responsible for identifying the clinical condition and licensing implications and take responsibility for these.	CbD, mini-CEX, MCR	1,2
Recognise the contribution and expertise of oncologists.	CbD, mini-CEX, MSF, MCR	1,2,3
Communicate in a timely and thoughtful way with patients/aviation	CbD, mini-CEX,	1,2,3,4



workers.	MSF, PS, MCR	
Show empathy to patients and aviation workers regarding licensing decisions and future/continued employment.	CbD, mini-CEX, MSF, PS, MCR	1,2,3,4

## Neurological disease

**The trainee will be able to assess a patient with neurological disease to produce a valid differential diagnosis, investigate appropriately, and formulate and implement an aeromedical management plan.**

	Assessment Methods	GMP
<b>Knowledge</b>		
Understand the clinical presentation, signs, symptoms, pathology, prognosis and treatment regimes for the main neurological diseases including: cerebrovascular disease, subarachnoid haemorrhage, neurodegenerative diseases, tumours, inflammatory diseases, infections, myasthenia gravis, injuries to the nervous system, paroxysmal disorders (especially migraine and epilepsy)	CbD, mini-CEX, DAvMed, MCR	1
Understand how these clinical presentations can influence licensing decisions, future/continued employment and passenger travel.	CbD, mini-CEX, DAvMed, MCR	1
<b>Skills</b>		
Ability to assess a patient with neurological disease and implement a management plan in conjunction with neurological disease specialists.	CbD, mini-CEX, MCR	1,3
Interpret the history and clinical signs to list appropriate differential diagnoses.	CbD, mini-CEX, MCR	1
Order, interpret and act on initial investigations and know when to refer patient/aviation workers for further management.	CbD, mini-CEX, MCR	1,2
Ability to interpret clinical finding with regard to licensing, future/continued employment and passenger travel.	CbD, mini-CEX, MCR	1,2
<b>Behaviours</b>		
Be responsible for identifying the clinical condition and licensing implications and take responsibility for these.	CbD, mini-CEX, MCR	1,2
Recognise the contribution and expertise of respiratory disease specialists	CbD, mini-CEX, MSF, MCR	1,2,3
Communicate in a timely and thoughtful way with patients/aviation workers.	CbD, mini-CEX, MSF, PS, MCR	1,2,3,4
Show empathy to patients and aviation workers regarding licensing decisions and future/continued employment	CbD, mini-CEX, MSF, PS, MCR	1,2,3,4

## Ophthalmologic disease

**The trainee will be able to assess a patient with ophthalmologic disease to produce a valid differential diagnosis, investigate appropriately, and formulate and implement an aeromedical management plan.**

	Assessment Methods	GMP
<b>Knowledge</b>		
Understand the clinical presentation, signs, symptoms, pathology, prognosis and treatment regimes for the main ophthalmologic diseases including: refractive error in aviation, ocular adnexae disease, ocular anterior segment disease, retinal disease,	CbD, mini-CEX, DAvMed, MCR	1

neurophthalmology.		
Understand how these clinical presentations can influence licensing decisions, future/continued employment and passenger travel.	CbD, mini-CEX, DAvMed, MCR	1
<b>Skills</b>		
Ability to assess a patient with ophthalmologic disease and implement a management plan in conjunction with ophthalmologic disease specialists.	CbD, mini-CEX, MCR	1,3
Interpret the history and clinical signs to list appropriate differential diagnoses.	CbD, mini-CEX, MCR	1
Order, interpret and act on initial investigations and know when to refer patient/aviation workers for further management.	CbD, mini-CEX, MCR	1,2
Ability to interpret clinical finding with regard to licensing, future/continued employment and passenger travel.	CbD, mini-CEX, MCR	1,2
<b>Behaviours</b>		
Be responsible for identifying the clinical condition and licensing implications and take responsibility for these.	CbD, mini-CEX, MCR	1,2
Recognise the contribution and expertise of ophthalmologists.	CbD, mini-CEX, MSF, MCR	1,2,3
Communicate in a timely and thoughtful way with patients/aviation workers.	CbD, mini-CEX, MSF, PS, MCR	1,2,3,4
Show empathy to patients and aviation workers regarding licensing decisions and future/continued employment	CbD, mini-CEX, MSF, PS, MCR	1,2,3,4

## Psychiatric disease

**The trainee will be able to assess a patient with psychiatric disease to produce a valid differential diagnosis, investigate appropriately, and formulate and implement an aeromedical management plan.**

<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Understand the clinical presentation, signs, symptoms, pathology, prognosis and treatment regimes for the main psychiatric diseases including: adjustment disorders, mood disorders, attempted suicide and para-suicide, acute stress disorder, post-traumatic stress disorder, phobias and fear of flying, personality disorders, schizophrenia and other delusional disorders, substance misuse.	CbD, mini-CEX, DAvMed, MCR	1
Understand how these clinical presentations can influence licensing decisions, future/continued employment and passenger travel.	CbD, mini-CEX, DAvMed, MCR	1
<b>Skills</b>		
Ability to assess a patient with psychiatric disease and implement a management plan in conjunction with psychiatric disease specialists.	CbD, mini-CEX, MCR	1,3
Interpret the history and clinical signs to list appropriate differential diagnoses.	CbD, mini-CEX, MCR	1
Order, interpret and act on initial investigations and know when to refer patient/aviation workers for further management.	CbD, mini-CEX, MCR	1,2
Ability to interpret clinical finding with regard to licensing, future/continued employment and passenger travel.	CbD, mini-CEX, MCR	1,2
<b>Behaviours</b>		

Be responsible for identifying the clinical condition and licensing implications and take responsibility for these.	CbD, mini- CEX, MCR	1,2
Recognise the contribution and expertise of psychiatric disease specialists.	CbD, mini-CEX, MSF, MCR	1,2,3
Communicate in a timely and thoughtful way with patients/aviation workers.	CbD, mini- CEX, MSF, PS, MCR	1,2,3,4
Show empathy to patients and aviation workers regarding licensing decisions and future/continued employment	CbD, mini-CEX, MSF, PS, MCR	1,2,3,4

## ENT

<b>The trainee will be able to assess a patient with ENT disease to produce a valid differential diagnosis, investigate appropriately, and formulate and implement an aeromedical management plan.</b>		
	<b>Assessment Methods</b>	<b>GMP</b>
<b>Knowledge</b>		
Understand the clinical presentation, signs, symptoms, pathology, prognosis and treatment regimes for the main ENT diseases including: barotraumas, hearing loss, vertigo, acoustic neuromas and other tumours, paranasal sinus disease and infections, obstructive sleep apnoea, facial palsies, trauma and post surgical complications/assessments.	CbD, mini-CEX, DAvMed, MCR	1
Understand how these clinical presentations can influence licensing decisions, future/continued employment and passenger travel.	CbD, mini-CEX, DAvMed, MCR	1
<b>Skills</b>		
Ability to assess a patient with ENT disease and implement a management plan in conjunction with ENT disease specialists.	CbD, mini-CEX, MCR	1,3
Interpret the history and clinical signs to list appropriate differential diagnoses.	CbD, mini-CEX, MCR	1
Order, interpret and act on initial investigations and know when to refer patient/aviation workers for further management.	CbD, mini-CEX, MCR	1,2
Ability to interpret clinical finding with regard to licensing, future/continued employment and passenger travel.	CbD, mini-CEX, MCR	1,2
<b>Behaviours</b>		
Be responsible for identifying the clinical condition and licensing implications and take responsibility for these.	CbD, mini-CEX, MCR	1,2
Recognise the contribution and expertise of ENT disease specialists.	CbD, mini-CEX, MSF, MCR	1,2,3
Communicate in a timely and thoughtful way with patients/aviation workers.	CbD, mini-CEX, MSF, PS, MCR	1,2,3,4
Show empathy to patients and aviation workers regarding licensing decisions and future/continued employment	CbD, mini-CEX, MSF, PS, MCR	1,2,3,4

## Orthopaedic and musculo-skeletal diseases

<b>The trainee will be able to assess a patient with orthopaedic and musculo-skeletal diseases to produce a valid differential diagnosis, investigate appropriately, and formulate and implement an aeromedical management plan.</b>		
	<b>Assessment Methods</b>	<b>GMP</b>
<b>Knowledge</b>		

Understand the clinical presentation, signs, symptoms, pathology, prognosis and treatment regimes for the main orthopaedic and musculo-skeletal diseases including: rheumatoid arthritis, seronegative arthritides, osteoarthritis and degenerative diseases, spinal disorders and deformities, bone and soft tissue tumours, metabolic bone diseases, trauma including gunshot wounds and battle injuries, and genetic disorders.	CbD, mini-CEX, DAVMed, MCR	1
Understand how these clinical presentations can influence licensing decisions, future/continued employment and passenger travel.	CbD, mini-CEX, MSF, PS, DAVMed, MCR	1
<b>Skills</b>		
Ability to assess a patient with musculo-skeletal disease and implement a management plan in conjunction with orthopaedic and musculo-skeletal disease specialists.	CbD, mini-CEX, MCR	1,3
Interpret the history and clinical signs to list appropriate differential diagnoses.	CbD, mini-CEX, MCR	1
Order, interpret and act on initial investigations and know when to refer patient/aviation workers for further management.	CbD, mini-CEX, MCR	1,2
Ability to interpret clinical finding with regard to licensing, future/continued employment and passenger travel.	CbD, mini-CEX, MCR	1,2
<b>Behaviours</b>		
Be responsible for identifying the clinical condition and licensing implications and take responsibility for these.	CbD, mini-CEX, MCR	1,2
Recognise the contribution and expertise of orthopaedic and musculo-skeletal disease specialists.	CbD, mini-CEX, MSF, MCR	1,2,3
Communicate in a timely and thoughtful way with patients/aviation workers.	CbD, mini-CEX, MSF, PS, MCR	1,2,3,4
Show empathy to patients and aviation workers regarding licensing decisions and future/continued employment	CbD, mini-CEX, MSF, PS, MCR	1,2,3,4

## Obstetrics and Gynaecology

**The trainee will be able to assess a patient with gynaecological diseases and/or who is pregnant to produce a valid differential diagnosis (in the cases of gynaecological diseases), investigate appropriately, and formulate and implement an aeromedical management plan.**

	Assessment Methods	GMP
<b>Knowledge</b>		
Understand the clinical presentation, signs, symptoms, pathology, prognosis and treatment regimes for the main gynaecological diseases. Understand the physiological changes associated with pregnancy and how the aviation environment can affect the mother and foetus.	CbD, mini-CEX, DAVMed, MCR	1
Understand how these clinical and physiological presentations can influence licensing decisions, future/continued employment and passenger travel.	CbD, mini-CEX, MSF, PS, DAVMed, MCR	1
<b>Skills</b>		
Ability to assess a patient with gynaecological disease and implement a management plan in conjunction gynaecological disease specialists.	CbD, mini-CEX, MCR	1,3

Interpret the history and clinical signs to list appropriate differential diagnoses.	CbD, mini-CEX, MCR	1
Order, interpret and act on initial investigations and know when to refer patient/aviation workers for further management.	CbD, mini-CEX, MCR	1,2
Ability to interpret clinical finding with regard to licensing, future/continued employment and passenger travel.	CbD, mini-CEX, MCR	1,2
<b>Behaviours</b>		
Be responsible for identifying the clinical condition and licensing implications and take responsibility for these.	CbD, mini-CEX, MCR	1,2
Recognise the contribution and expertise of gynaecological disease specialists and obstetricians.	CbD, mini-CEX, MSF, MCR	1,2,3
Communicate in a timely and thoughtful way with patients/aviation workers.	CbD, mini-CEX, MSF, PS, MCR	1,2,3,4
Show empathy to patients and aviation workers regarding licensing decisions and future/continued employment	CbD, mini-CEX, MSF, PS, MCR	1,2,3,4

## 10. Altitude (Hypobaric) Chamber Procedures

### Ground based pressure breathing

<b>To progressively develop the ability to demonstrate and teach ground based pressure breathing training.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Describe the pressure breathing rig (PBR) simulator for ground based training in high altitude protection against hypoxia.	CbD, DAVMed, MCR	1
Familiarisation with the breathing pattern required when breathing gases at pressures above ambient	CbD, DAVMed, MCR	1
<b>Skills</b>		
Practical demonstration of PBR simulator for ground based training.	CbD, DOPS, MCR	1
<b>Behaviours</b>		
Demonstrate a positive and safe approach to training.	CbD, MCR	1,2

### Medical requirements for altitude chamber exposure

<b>To progressively develop the ability to perform medical examinations and assess medical fitness for personnel undergoing altitude chamber exposure.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Assessment of medical fitness to undergo decompression	CbD, mini-CEX, DAVMed, MCR	1
<b>Skills</b>		
Perform medical examination of personnel undergoing altitude chamber exposure.	CbD, mini-CEX, DOPS, MCR	1
<b>Behaviours</b>		
Demonstrate an understanding of and ability to detect, medical conditions prohibiting decompression.	CbD, mini-CEX, MCR	1

### Altitude chamber emergencies

<b>To progressively develop the ability to assess and manage the types of potential emergencies arising in a hypobaric chamber exposure.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Knowledge of the types of potential emergencies arising in a hypobaric chamber exposure.	CbD, DAVMed, MCR	1
Understand the conditions which are likely to lead to collapse and loss of consciousness, and relatively minor incidents associated with pressure change effects on the ears and sinuses.	CbD, DAVMed, MCR	1
Understand the conditions requiring recompression and subsequent medical treatment: hypoxia, hyperventilation decompression sickness, acute abdominal distension, pressure breathing syncope, lung rupture and air embolism and coincidental medical conditions.	CbD, DAVMed, MCR	1
<b>Skills</b>		

Demonstrate an understanding and practice of the emergency chamber procedures.	CbD, mini-CEX, DOPS, MCR	1
Demonstrate emergency treatment guidelines.	CbD, mini-CEX, DOPS, MCR	1
Demonstrate competency in hyperbaric treatment.	CbD, mini-CEX, DOPS, MCR	1
Successful completion of a hyperbaric medicine course such as the RN "Standard Underwater Medicine Course" or other civilian equivalent.	CbD, mini-CEX, DOPS, MCR	1
<b>Behaviours</b>		
Relate theoretical knowledge to patient management	CbD mini-CEX, MCR	1
Contribute to multidisciplinary team working.	CbD, mini-CEX, MSF, MCR	1,3
Consult with other relevant specialists appropriately	CbD, mini-CEX, MSF, MCR	1,3

### Rapid decompression chamber runs

**To progressively develop the ability to conduct rapid decompression chamber runs and manage chamber emergencies.**

	<b>Assessment Methods</b>	<b>GMP</b>
<b>Knowledge</b>		
Understand the operating procedures together with the emergency safety procedures for rapid decompression chamber runs.	CbD, DAVMed, MCR	1
Understand the need for pressure breathing in certain altitude exposures.	CbD, DAVMed, MCR	1
<b>Skills</b>		
Conduct the rapid decompression either from within the large compartment of the chamber or from outside the chamber.	CbD, DOPS, MCR	
Demonstrate competency in managing chamber emergencies.	CbD, mini-CEX, DOPS, MCR	1
<b>Behaviours</b>		
Contribute to multidisciplinary team working.	CbD, mini-CEX, MSF, MCR	1,3

### Hypoxia demonstrations

**To progressively develop the ability to conduct safely hypobaric hypoxia demonstrations.**

	<b>Assessment Methods</b>	<b>GMP</b>
<b>Knowledge</b>		
Understand the clinical manifestations of hypoxia.	CbD, DAVMed, MCR	1
Knowledge of altitude chamber procedures for hypoxia demonstrations.	CbD, DAVMed, MCR	1
<b>Skills</b>		
Conduct a hypobaric hypoxia demonstration.	CbD, DOPS, MCR	1
Demonstrate chamber emergency procedures.	CbD, DOPS,	1

	DAvMed, MCR	
Demonstrate the ability to recognise the manifestations of hypoxia.	CbD, DOPS, MCR	1
Demonstrate chamber emergency procedures.	CbD, DOPS, MCR	1
<b>Behaviours</b>		
Contribute to multidisciplinary team-working.	CbD, MSF, MCR	1,3

### Working practices

<b>To progressively develop the ability to work in the chamber in a safe way.</b>		
	<b>Assessment Methods</b>	<b>GMP</b>
<b>Knowledge</b>		
Be conversant with relevant protocols and documentation of hypobaric chamber working practices.	CbD, DAvMed, MCR	1
<b>Skills</b>		
Be able to work in the chamber in a safe way.	CbD, DOPS, MCR	1
<b>Behaviours</b>		
Take an active interest in safe working practices for all staff and subjects in the chamber hall.	CbD, MSF, MCR	1,3



## 11. Exposure to Hypobaric Conditions (High Altitude) – Assessment of Aircrew Personal Protective Equipment

### Role of personal protective equipment in mitigating effects of high altitude exposure

To progressively develop the ability to show how personal protective equipment works and how the physiological effects of hypoxia can alter aircrew performance.

Knowledge	Assessment Methods	GMP
A comprehensive understanding of the effects of hypobaric and hypoxic conditions on the cardio-vascular, respiratory and musculo-skeletal systems and how personal protective equipment functions to mitigate these effects.	CbD, DAvMed, MCR	1
Skills		
Describe how the physiological effects of hypoxia can alter aircrew performance.	CbD, DOPS, MCR	1
Show how personal protective equipment works in principle, and the limitations of protective equipment in practice.	CbD, DOPS, MCR	1
Behaviours		
Have a balanced view over the compromises required when providing individuals with personal protective equipment	CbD, MCR	1

### Personal protective equipment integration for protection for high altitude

To progressively develop the ability to conduct an assessment of the fit and function of individual items of aircrew personal protective equipment under altitude chamber conditions.

Knowledge	Assessment Methods	GMP
The practical application of physiological, anatomical, anthropometric and medical knowledge to ensure that personal protective equipment enables aircrew to carry out routine and emergency procedures encountered under hypobaric and hypoxic conditions.	CbD, DAvMed, MCR	1
Skills		
Conduct an assessment of the fit and function of individual items of aircrew personal protective equipment under altitude chamber conditions including the relationship and interaction between aircrew body/body segment dimensions and cockpit geometry.	CbD, DOPS, MCR	1,2
Conduct functional assessments of human performance during altitude exposure using protective equipment.	CbD, DOPS, MCR	1
Behaviours		
Be responsible for identifying whether protective equipment offers adequate physiological protection to maintain aircrew performance in the cockpit.	CbD, MCR	1,2
Ensure there is an acceptable compromise between protection and performance limitations, and take responsibility for decisions taken.	CbD, MCR	1

## Physiological monitoring during personal equipment assessment under high altitude exposure

**To progressively develop the ability to perform physiological monitoring necessary to assess the performance and limitations of protective equipment.**

<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Understand the various modalities of physiological monitoring necessary to assess the performance and limitations of protective equipment.	CbD, DAvMed, MCR	1
<b>Skills</b>		
Demonstrate an understanding of the physiological principles underlying the monitoring techniques used.	CbD, DOPS, MCR	1
Identify typical sources of error during physiological monitoring.	CbD, DOPS, MCR	1
Describe the most appropriate parameters to be monitored for each type of protective equipment, and be familiar with the limitations of physiological monitoring.	CbD, DOPS, MCR	1
Describe monitoring techniques used to determine the physical performance of protective systems.	CbD, DOPS, MCR	1
<b>Behaviours</b>		
Provide an impartial assessment based on rigorous scientific methods, in a safe manner, to enable evidence based decisions on protective equipment to be made.	CbD, MCR	1,2

## Reporting of findings

**To progressively develop the ability to write a report based on the findings of the assessment, and to a standard comparable with those in peer reviewed journals.**

<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Have knowledge of aircrew and passenger equipment procurement organisations and responsible bodies.	CbD, DAvMed, MCR	1
Understand appropriate format and channels for reporting.	CbD, DAvMed, MCR	1
<b>Skills</b>		
Write a report based on the findings of the assessment, with recommendations.	CbD, DOPS, MCR	1
Produce finished reports in a timely way.	CbD, DOPS, MCR	1
Produce reports to a high standard of clarity and accuracy, comparable with those in peer reviewed scientific literature.	CbD, DOPS, MCR	1
<b>Behaviours</b>		
Provide a sound basis for financial and policy decisions relating to personal protective equipment for aircrew.	CbD, MCR	1

## 12. Clinical Assessment of Aircrew in the Hypobaric Chamber

### Return to flying medical assessments

<b>To progressively develop the ability to determine fitness for return to flying by carrying out altitude chamber medical assessments.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Determine fitness for return to flying.	mini-CEX, CbD, DAvMed, MCR	1
<b>Skills</b>		
Perform medical examination of personnel undergoing decompression.	mini-CEX, CbD, DOPS, MCR	1
Demonstrate an understanding and ability to detect medical conditions prohibiting decompression.	mini-CEX, CbD, DOPS, MCR	1
Brief the patients deemed fit for decompression explaining the actual procedure and potential hazards in detail.	mini-CEX, CbD, DOPS, MCR	1
<b>Behaviours</b>		
Show empathy with those who potentially may lose flying category and/or livelihood.	mini-CEX, CbD, PS, MCR	1,3,4

### Medical conditions disqualifying from flying

<b>To progressively develop the ability to detect and have thorough knowledge of the conditions resulting in medical disqualification from flying.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Knowledge of the medical conditions which may preclude return to flying, including post-operative conditions and treatment regimes	mini-CEX, CbD, DAvMed, MCR	1
<b>Skills</b>		
Demonstrate an ability to detect and have thorough knowledge of the conditions resulting in medical disqualification from flying.	mini-CEX, CbD, DOPS, MCR	1
<b>Behaviours</b>		
Be responsible for the identification of any limitations to returning to flying and take responsibility for them.	mini-CEX, CbD, MCR	1,2

### Chamber procedures and emergencies

<b>To progressively develop the ability to demonstrate competency in chamber procedures.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Thorough knowledge of the hypobaric chamber procedures including emergency chamber procedures.	CbD, DAvMed, MCR	1
Understand the conditions which are likely to lead to collapse and loss of consciousness, and relatively minor incidents associated with pressure change effects on the ears and sinuses.	CbD, DAvMed, MCR	1
Understand the conditions requiring recompression and subsequent	CbD, DAvMed, MCR	1

medical treatment		
<b>Skills</b>		
Demonstrate competency in the particular chamber profiles required.	CbD, DOPS, MCR	1
Understand the physiological demands and requirements of the required chamber profiles.	CbD, DOPS, MCR	1
<b>Behaviours</b>		
Relate theoretical knowledge to patient management	CbD, MCR	1
Contribute to multidisciplinary team-working.	CbD, MSF, MCR	1,3
Consult with other relevant specialists appropriately.	CbD, MSF, MCR	1,3

### **Aeromedical disposition report**

<b>To progressively develop the ability to write a report with appropriate aeromedical disposition recommendations based on licensing requirements.</b>		
	<b>Assessment Methods</b>	<b>GMP</b>
<b>Knowledge</b>		
Knowledge of military and civilian aeromedical disposition and licensing requirements.	mini-CEX, CbD, DAVMed, MCR	1,3
<b>Skills</b>		
Write a report with suitable summaries and aeromedical disposition recommendations.	mini-CEX, CbD, DOPS, MCR	1,3
Produce finished reports in a timely way.	mini-CEX, CbD, DOPS, MCR	1,3
<b>Behaviours</b>		
An impartial stance and a commitment to justification of any opinion from a balanced interpretation of medical findings.	mini-CEX, CbD, MSF, PS, MCR	1,3

### 13. Exposure to Long Duration Acceleration – Human Centrifuge Procedures

#### Medical requirements for long duration acceleration exposure

<b>To progressively develop the ability to assess medical fitness to undergo high-G exposure and to detect medical conditions contra-indicating exposure.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Assessment of medical fitness to undergo high-G exposure	mini-CEX, CbD, DAvMed, MCR	1
<b>Skills</b>		
Perform medical examination of personnel undergoing acceleration exposure.	mini-CEX, CbD, DOPS, MCR	1
Demonstrate an understanding of and ability to detect medical conditions contra-indicating exposure.	mini-CEX, CbD, DOPS, MCR	1
<b>Behaviours</b>		
Relate theoretical knowledge of risk factors to safe selection of individuals for acceleration exposure.	mini-CEX, CbD, PS, MCR	1,2

#### Medical monitoring during acceleration exposure

<b>To progressively develop the ability to medically monitor human centrifuge exposures.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Understand the requirements for, and various modalities of medical monitoring necessary to ensure safety during human centrifuge exposures.	mini-CEX, CbD, DAvMed, MCR	1,2
<b>Skills</b>		
Demonstrate an understanding of when specific medical monitoring techniques are required.	mini-CEX, CbD, DOPS, MCR	1,2
Be familiar with the typical changes (both normal and abnormal) seen during acceleration exposure.	mini-CEX, CbD, DOPS, MCR	1,2
<b>Behaviours</b>		
Use all appropriate tools to ensure patient safety.	mini-CEX, CbD, MCR	1,2

#### Centrifuge emergencies

<b>To progressively develop the ability to manage safely centrifuge emergency procedures.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Describe the types of emergency arising in a human centrifuge.	CbD, DAvMed, MCR	1
Understand the conditions which are likely to lead to collapse and loss of consciousness, musculo-skeletal injury and acute cardiovascular compromise.	CbD, DAvMed, MCR	1
<b>Skills</b>		
Demonstrate an understanding in principle and practice of centrifuge	CbD, DOPS, MCR	1,2

emergency procedures.		
Recognise impending or actual centrifuge emergencies and act upon them in a timely manner.	CbD, DOPS, MCR	1
Demonstrate knowledge of emergency treatment guidelines including ILS or ACLS where indicated.	CbD, DOPS, MCR	1
<b>Behaviours</b>		
Relate theoretical knowledge to patient management	CbD, MCR	1,4
Contribute to multidisciplinary team-working.	CbD, MSF, MCR	1,3
Consult with other relevant specialists appropriately.	CbD, MSF, MCR	1,3

### Operating procedures and working practices

<b>To progressively develop the ability to operate human centrifuges in a safe manner.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Be conversant with relevant protocols and documentation for human centrifuge operation and working practices.	CbD, DAvMed, MCR	1,2
<b>Skills</b>		
Be able to direct operation of the human centrifuge such that all acceleration exposures are conducted in a safe manner.	CbD, DOPS, MCR	1,2
<b>Behaviours</b>		
Take an active interest in safe working practices for all staff and subjects in the centrifuge.	CbD, MSF, MCR	1,2

## 14. Exposure to Long Duration Acceleration – Clinical Assessment of Aircrew on the Centrifuge

### Effect of acceleration exposure on human physiology

To progressively develop the ability to assess the effects of long duration acceleration on healthy individuals and in disease.		
Knowledge	Assessment Methods	GMP
A comprehensive understanding of the effects of long duration acceleration exposure on the cardio-vascular, respiratory and musculo-skeletal systems in the healthy individual and in disease.	CbD, DAvMed, MCR	1
Skills		
Describe how the physiological effects of acceleration exposure can alter aircrew performance, and using this knowledge, interpret the potential effects of various disease states.	CbD, DOPS, MCR	1,2
Behaviours		
Show good judgement on which clinical conditions may impact on human acceleration tolerance, and which may place individuals at increased risk.	CbD, MCR	1,2

### Return to flying medical assessments

To progressively develop the ability to determine fitness for flight in the high-G environment.		
Knowledge	Assessment Methods	GMP
Determine fitness for return to flying in the high-G environment	mini-CEX, CbD, DAvMed, MCR	1,2
Skills		
Provide a full explanation of the procedure and potential hazards to the patient, and gain informed consent.	mini-CEX, CbD, DOPS, MCR	1,2
Conduct and interpret the results of a tilt table assessment (orthostatic challenge).	mini-CEX, CbD, DOPS, MCR	1
Conduct a series of acceleration exposures on the human centrifuge which are appropriate to the condition under investigation, and the flying role of the patient.	mini-CEX, CbD, DOPS, MCR	1
Observe and interpret the physiological changes demonstrated.	mini-CEX, CbD, DOPS, MCR	1
Behaviours		
Show empathy with those who potentially may lose flying category and/or livelihood.	mini-CEX, CbD, MSF, PS, MCR	1,2,3

### Medical monitoring during clinical centrifuge assessment

To progressively develop the ability to carry out measurements appropriate in the assessment of medical fitness in the high-G environment.		
Knowledge	Assessment Methods	GMP

Understand the various modalities of medical monitoring necessary to ensure safety during human centrifuge exposures, and those measurements appropriate in the assessment of medical fitness.	CbD, DAVMed, MCR	1
<b>Skills</b>		
Demonstrate an understanding of the specific medical monitoring techniques used.	CbD, DOPS, MCR	1
Identify the typical changes seen during disease states.	CbD, DOPS, MCR	1
<b>Behaviours</b>		
Use all appropriate tools for accurate clinical assessment and to ensure patient safety.	CbD, PS, MCR	1,2

### Aeromedical disposition report

<b>To progressively develop the ability to deliver an appropriate report providing military and civilian aeromedical disposition and licensing requirements.</b>		
	<b>Assessment Methods</b>	<b>GMP</b>
<b>Knowledge</b>		
Knowledge of military and civilian aeromedical disposition and licensing requirements.	mini-CEX CbD, DAVMed, MCR	1
<b>Skills</b>		
Write a report based on the finding of the long duration acceleration assessment, with suitable summaries and aeromedical disposition recommendations.	mini-CEX CbD, DOPS, MCR	1
Produce finished reports in a timely manner.	mini-CEX CbD, DOPS, MCR	1
<b>Behaviours</b>		
An impartial stance and a commitment to justification of any opinion from a balanced interpretation of medical findings.	mini-CEX CbD, PS, MCR	1,3



## 15. Exposure to Long Duration Acceleration – Assessment of Aircrew Personal Protective Equipment

### Role of personal protective equipment in mitigating effects of acceleration exposure

To progressively develop the ability to demonstrate how personal protective equipment mitigates the effects of long duration acceleration of the human.

Knowledge	Assessment Methods	GMP
A comprehensive understanding of the effects of long duration acceleration exposure on the cardio-vascular, respiratory and musculo-skeletal systems and how personal protective equipment functions to mitigate these effects.	CbD, DAVMed, MCR	1
Skills		
Describe how the physiological effects of acceleration exposure can alter aircrew performance.	CbD, DOPS, MCR	1
Show how personal protective equipment works in principle, and the limitations of protective equipment in practice.	CbD, DOPS, MCR	1
Behaviours		
Have a balanced view over the compromises required when providing individuals with personal protective equipment.	CbD, MCR	1,2

### Personal protective equipment integration under acceleration

To progressively develop the ability to assess the fit and function of individual items of aircrew personal protective equipment under increased acceleration.

Knowledge	Assessment Methods	GMP
The practical application of physiological, anatomical, anthropometric and medical knowledge to ensure that personal protective equipment enables aircrew to carry out routine and emergency procedures encountered under high acceleration loads.	CbD, DAVMed, MCR	1
Skills		
Conduct an assessment of the fit and function of individual items of aircrew personal protective equipment under increased acceleration, including the relationship and interaction between aircrew body/body segment dimensions and cockpit geometry.	CbD, DOPS, MCR	1,2
Conduct functional assessments of human performance during acceleration exposure using protective equipment.	CbD, DOPS, MCR	1,2
Behaviours		
Be responsible for identifying whether protective equipment offers adequate physiological protection to maintain aircrew performance and prevent injury in the cockpit under G.	CbD, MCR	1,2
Ensure there is an acceptable compromise between protection and performance limitations, and take responsibility for decisions taken.	CbD, MCR	1,2

## Physiological monitoring during personal equipment assessment under increased acceleration

<b>To progressively develop the ability to carry out physiological monitoring to assess the performance and limitations of protective equipment.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Understand the various modalities of physiological monitoring necessary to assess the performance and limitations of protective equipment.	CbD, DAvMed, MCR	1,2
<b>Skills</b>		
Demonstrate an understanding of the physiological principles underlying monitoring techniques used.	CbD, DOPS, MCR	1
Describe the most appropriate parameters to be monitored for each type of protective equipment, and be familiar with the limitations of physiological monitoring.	CbD, DOPS, MCR	1
Describe monitoring techniques used to determine the physical performance of protective systems.	CbD, DOPS, MCR	1
Identify typical sources of error during physiological monitoring.	CbD, DOPS, MCR	1
<b>Behaviours</b>		
Provide an impartial assessment based on rigorous scientific methods, in a safe manner, to enable evidence based decisions on protective equipment to be made.	CbD, MCR	1,2

## Reporting of findings

<b>To progressively develop the ability to write a report based on the findings of the assessment, with recommendations.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Have knowledge of aircrew and passenger equipment procurement organisations and responsible bodies.	CbD, DAvMed, MCR	1
Understand appropriate format and channels for reporting.	CbD, DAvMed, MCR	1
<b>Skills</b>		
Write a report based on the findings of the assessment, with recommendations.	CbD, DOPS, MCR	1
Produce finished reports in a timely way.	CbD, DOPS, MCR	1
Produce reports to a high standard of clarity and accuracy, comparable with those in peer reviewed scientific literature	CbD, DOPS, MCR	1
<b>Behaviours</b>		
Provide a sound basis for financial and policy decisions relating to personal protective equipment for aircrew.	CbD, MCR	1,2

## 16. Exposure to Long Duration Acceleration – Assessment of Aircrew Health Issues and Life Support Systems

### Role of life support systems in mitigating effects of acceleration exposure

To progressively develop the ability to describe how the physiological effects of acceleration exposure can alter aircrew performance and how aircrew life support systems mitigate these effects.

Knowledge	Assessment Methods	GMP
Understand the effects of long duration acceleration exposure on the cardio-vascular and respiratory systems, and how breathing gas and anti-G systems are used to mitigate these effects.	CbD, DAVMed, MCR	1
Skills		
Describe how the physiological effects of acceleration exposure can alter aircrew performance.	CbD, DOPS, MCR	1
Explain the mode of operation of aircrew life support systems.	CbD, DOPS, MCR	1
Behaviours		
Be aware of the context as to how consciousness can be preserved at high G levels.	CbD, MCR	1

### Unmanned testing

To progressively develop the ability to conduct accurate and appropriate unmanned tests of life support equipment.

Knowledge	Assessment Methods	GMP
Understand the role and procedures required for unmanned testing of life support systems under increased acceleration.	CbD, DAVMed, MCR	1
Skills		
Conduct accurate and appropriate unmanned tests of life support equipment under increased acceleration.	CbD, DOPS, MCR	1
Behaviours		
Realise the importance of unmanned testing of equipment before human exposure in a hazardous environment.	CbD, MCR	1,2

### Issues affecting aircrew health under increased G

To progressively develop the ability to devise research protocols and conduct studies to examine the effects of acceleration.

Knowledge	Assessment Methods	GMP
Be aware of the environmental factors, and those resulting from the use of protective systems, which may cause short or long term health effects in aircrew.	mini-CEX, CbD, DAVMed, MCR	1,2
Skills		
Devise research protocols, and conduct studies to examine the	mini-CEX, CbD,	1,2

effects of acceleration-related factors on aircrew health.	DOPS, MCR	
<b>Behaviours</b>		
Be aware that aircrew may suffer health effects from occupational exposure to high G, and understand the requirements to investigate and monitor these effects.	mini-CEX, CbD, MCR	1,2

### Physiological monitoring for aircrew health and life support system assessments under increased acceleration

<b>To progressively develop the ability to assess the performance of aircrew life support systems and health related medical investigations.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Understand the various modalities of physiological monitoring necessary to assess the performance of aircrew life support systems, and health related medical investigations.	CbD, DAVMed, MCR	1
<b>Skills</b>		
Demonstrate an understanding of the physiological principles underlying monitoring techniques used.	CbD, DOPS, MCR	1
Describe the most appropriate parameters to be monitored and be familiar with the limitations of physiological monitoring.	CbD, DOPS, MCR	1
Identify typical sources of error during physiological monitoring.	CbD, DOPS, MCR	1
Describe monitoring techniques used to determine the physical system performance (pressure, flow, etc) of life support systems.	CbD, DOPS, MCR	1
<b>Behaviours</b>		
Provide an impartial assessment based on rigorous scientific methods, to enable evidence based decisions on aircrew life support systems and aircrew health issues to be made.	CbD, MCR	1

### Reporting of findings

<b>To progressively develop the ability to produce reports to a high standard of clarity and accuracy, comparable with those in peer reviewed scientific literature.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Have knowledge of aircrew and passenger equipment procurement organisations and responsible bodies.	CbD, DAVMed, MCR	1,2
Understand appropriate format and channels for reporting.	CbD, MCR	1
<b>Skills</b>		
Write a report based on the findings of the assessment, with recommendations.	CbD, DOPS, MCR	1
Produce finished reports in a timely way.	CbD, DOPS, MCR	1
Produce reports to a high standard of clarity and accuracy, comparable with those in peer reviewed scientific literature.	CbD, DOPS, MCR	1
<b>Behaviours</b>		
Provide a sound basis for financial and policy decisions relating to aircrew life support systems, and aircrew health issues.	CbD, MCR	1

## 17. Exposure to Long Duration Acceleration – Training of Aircrew

### Physiological principles of protection against acceleration

To progressively develop the ability to describe the techniques available to aircrew to augment acceleration protection.

Knowledge	Assessment Methods	GMP
Have a full understanding of the physiological principles underlying protection against long duration acceleration, and the physical techniques and systems used to mitigate these effects.	CbD, DAvMed, MCR	1
Skills		
Describe the techniques available to aircrew to augment acceleration protection.	CbD, DOPS, MCR	1
Behaviours		
Recognise the value of aeromedical education of aviators to improve flight safety.	CbD, MCR	1,2

### Conduct centrifuge experience for aircrew and teach acceleration counter-measures

To progressively develop the ability to be competent in the teaching of acceleration countermeasures to aircrew.

Knowledge	Assessment Methods	GMP
Understand how to use a human centrifuge to demonstrate the common physiological effects of acceleration to aircrew in a safe manner.	CbD, DAvMed, MCR	1,2
Understand how a centrifuge can be used to teach acceleration protection strategies to aircrew.	CbD, DAvMed, MCR	1,2
Skills		
Be competent in the performance of the anti-G straining manoeuvre.	CbD, DOPS, TO, MCR	1
Be competent in the teaching of acceleration countermeasures to aircrew.	CbD, DOPS, TO, MCR	1
Recognise and correct common errors in use of countermeasures.	CbD, DOPS, TO, MCR	1
Behaviours		
Be an effective trainer to ensure the safety of aircrew.	CbD, PS, MSF, TO, MCR	1,2

## 18. Aircraft Accident Investigation

### Pathological basis of injury

<b>To progressively develop the ability to identify morphological abnormalities and interpreting autopsy and clinical findings in relation to the injury mechanisms.</b>		
	<b>Assessment Methods</b>	<b>GMP</b>
<b>Knowledge</b>		
A wide knowledge of the pathological basis of injury and of the various types of injury mechanisms.	mini-CEX, CbD, DAvMed, MCR	1
Knowledge of the literature relating to issues and to difficulties in interpreting subjective changes is necessary.	mini-CEX, CbD, DAvMed, MCR	1
Have a broad knowledge of techniques used in identifying abnormalities	mini-CEX, CbD, DAvMed, MCR	1
<b>Skills</b>		
A high standard of practice in the techniques used for identifying morphological abnormalities and interpreting autopsy and clinical findings.	mini-CEX, CbD, DOPS, MCR	1
<b>Behaviours</b>		
Be able to identify and address the issues raised by an aircraft accident.	mini-CEX, CbD, MCR	1
Be responsible for identification of the injury causation and take responsibility for this.	mini-CEX, CbD, MCR	1

### Clinical liaison

<b>To progressively develop the ability to be able to identify issues to be addressed by the clinical/autopsy examination.</b>		
	<b>Assessment Methods</b>	<b>GMP</b>
<b>Knowledge</b>		
Have an understanding of the use of clinical information and the health record of those involved and understand the limitations on dissemination of clinical information to third parties.	mini-CEX, CbD, DAvMed, MCR	1
<b>Skills</b>		
Be able to interrogate the clinical records and understand the utility and limitations associated with various types of investigation including imaging and biochemistry.	mini-CEX, CbD, DOPS, MCR	1
Be able to identify issues to be addressed by the clinical/autopsy examination.	mini-CEX, CbD, DOPS, MCR	1
<b>Behaviours</b>		
Be conversant with current clinical practice.	mini-CEX, CbD, MCR	1
Be able to liaise with clinical colleagues in order to obtain clinical information during the investigation.	mini-CEX, CbD, MSF, MCR	1
Know the main side effects of treatments with respect to the flight environment.	mini-CEX, CbD, MCR	1

## On site investigation

**To progressively develop the ability to document and record of evidence during an investigation.**

<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Be familiar with the requirements of an investigation.	mini-CEX, CbD, DAvMed, MCR	1
Detailed knowledge of the practicalities of on-scene investigation and familiarity with common scenes.	mini-CEX, CbD, DAvMed, MCR	1
Knowledge of what to record at a scene, features to be sought and the taking and interpretation of evidence.	mini-CEX, CbD, DAvMed, MCR	1
Knowledge of the function of other on-scene experts	mini-CEX, CbD, DAvMed, MCR	1
<b>Skills</b>		
Understand the technical and clinical requirements.	mini-CEX, CbD, DOPS, MCR	1
Documentation and recording of evidence.	mini-CEX, CbD, DOPS, MCR	1
Ability to retrieve and trace evidence, and formulate strategies for appropriate investigation and prioritisation of activities.	mini-CEX, CbD, DOPS, MCR	1
<b>Behaviours</b>		
Understand the need for investigation of scenes by a multidisciplinary team using appropriate expertise.	mini-CEX, CbD, MCR	1
Understand the need for attention to detail and correlation with history.	mini-CEX, CbD, MCR	1
Understand the benefits of working in a team.	mini-CEX, CbD, MSF, MCR	1,3

## Medico-legal issues

**To progressively develop the ability to be conversant with current legislation and regulations relating to medico-legal aspects of accident investigations.**

<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Be familiar with the legislative background to the investigation	CbD, DAvMed, MCR	1
<b>Skills</b>		
Be conversant with current legislation and regulations relating to medico-legal aspects of accident investigations and the role of military and civilian aviation and medical authorities	CbD, DOPS, MCR	1
<b>Behaviours</b>		
An impartial stance and a commitment to justification of any opinion from a balanced interpretation of medical literature.	CbD, MCR	1
A commitment to best practice	CbD, MCR	1,2

## Reports

**To progressively develop the ability to write a report with suitable summaries and recommendations.**

	Assessment Methods	GMP
<b>Knowledge</b>		
Knowledge of military and civilian documents relating to the production of accident reports.	mini-CEX, CbD, MCR	1,2
<b>Skills</b>		
Write a final report with suitable summaries and recommendations.	mini-CEX, CbD, DOPS, MCR	1
Produce finished reports in a timely way.	mini-CEX, CbD, DOPS, MCR	1
<b>Behaviours</b>		
Caution in reiterating medical histories, especially where sensitive personal information is concerned.	mini-CEX, CbD, MCR	1,4
An impartial stance and a commitment to justification of any opinion from a balanced interpretation of medical and technical findings.	mini-CEX, CbD, MCR	1

## Photography

To progressively develop the ability to document accident site evidence.		
	Assessment Methods	GMP
<b>Knowledge</b>		
Be aware of the need to document accident site evidence	CbD, MCR	1
<b>Skills</b>		
Be able to use a camera.	DOPS, MCR	1
<b>Behaviours</b>		
Be aware of confidentiality issues.	CbD, MCR	1

## Teaching

To progressively develop the ability to teach accident investigation techniques.		
	Assessment Methods	GMP
<b>Knowledge</b>		
Be aware of the value of the accident investigation as a teaching aid.	CbD, TO, MCR	1
<b>Skills</b>		
Appropriate teaching skills.	DOPS, TO, MCR	1,3
<b>Behaviours</b>		
Be prepared to teach at every available opportunity.	CbD, TO, MCR	1,3

## Inquests

To progressively develop the ability to have practical experience of judicial inquiries into deaths.		
	Assessment Methods	GMP
<b>Knowledge</b>		
Have a working knowledge of the judicial process particularly within the Coroner's court and the role of the medical witness.	CbD, MCR	1
<b>Skills</b>		



Practical experience of judicial inquiries into deaths.	CbD, MCR	1
Be familiar with inquest procedure and have experience observing inquests and ideally of giving evidence in court.	CbD, DOBS, MCR	1
<b>Behaviours</b>		
Can maintain an impartial stance.	CbD, MCR	1
Skilled presentation of complex issues in a simple manner.	CbD, MCR	1
Recognise role as provider of information to the court and recognise limitations of expertise.	CbD, MSF, MCR	1
An ability to identify flight safety issues and to facilitate any further investigations.	CbD, MCR	1

## Health and Safety

<b>To progressively develop the ability to be able to work at the crash site safely.</b>		
	<b>Assessment Methods</b>	<b>GMP</b>
<b>Knowledge</b>		
Have an understanding of relevant protocols and documentation of departmental working practices, and be familiar with the practicalities of accident investigation practice.	mini-CEX, CbD, MCR	1
Have a working knowledge of the regulatory aspects of health and safety issues, sufficient to be able to draw up an accident site policy	mini-CEX, CbD, MCR	1,2,3
<b>Skills</b>		
Be able to work at the crash site in a safe way.	mini-CEX, CbD, DOBS, MCR	1,2
<b>Behaviours</b>		
Take an active interest in safe working practices for all staff and visitors to the site and accident laboratory.	mini-CEX, CbD, MSF, MCR	1,2

## Future developments

<b>To progressively develop the ability to maintain an awareness of developments in the field and in legislation and regulations.</b>		
	<b>Assessment Methods</b>	<b>GMP</b>
<b>Knowledge</b>		
Have knowledge of the concepts that underpin continuing professional development, revalidation and quality assurance.	CbD, mini-CEX, MCR	1
<b>Skills</b>		
Maintain an awareness of developments in the field and in legislation and regulations, that may lead to developments of or changes in practice	CbD, mini-CEX, MCR	1
<b>Behaviours</b>		
A commitment to improving practice	CbD, mini-CEX, MCR	1

## 19. Assisted Aircrew Escape System Testing

### Ejection sequence

<b>To progressively develop the ability to analyse the techniques used for testing ejection systems.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Comprehensive knowledge of the ejection sequence, and the dynamic forces involved.	CbD, min-CEX, DAvMed, MCR	1
Have a thorough understanding of the clinical manifestations of ejection injury and the various imaging techniques and treatment modalities.	CbD, min-CEX, DAvMed, MCR	1
Wide knowledge of the causation mechanisms of ejection injury.	CbD, min-CEX, DAvMed, MCR	1
<b>Skills</b>		
A high standard of practice in the techniques used for analysing ejection systems.	DOPS, CbD, min-CEX, MCR	1
Be able to interpret recorded real time dynamic forces and acceleration-time profiles and correlate with likely injuries.	DOPS, CbD, min-CEX, MCR	1
<b>Behaviours</b>		
Be able to identify and address the issues raised by the system testing.	CbD, min-CEX, MCR	1
Be responsible for the identification of the limitations and take responsibility for this.	CbD, min-CEX, MCR	1
An impartial stance and a commitment to justification of any opinion from a balanced interpretation of test findings.	CbD, min-CEX, MCR	1

### Ejection sequence modelling

<b>To progressively develop the ability to interrogate and interpret results to determine the likely functioning of the systems.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Understand the importance and limitations of ejection sequence modelling.	CbD, MCR	1
Knowledge of mathematical injury predictors and correlation with clinical presentations.	CbD, MCR	1
<b>Skills</b>		
Be able to interrogate and programme models and interpret results to determine the likely functioning of the systems.	DOPS, CbD, MCR	1
Interpret the results to determine a predicted clinical outcome.	DOPS, CbD, MCR	1
<b>Behaviours</b>		
Be able to identify and address the issues raised by the modelling results.	CbD, MCR	1

## Anthropomorphic test dummies (ATD)

<b>To progressively develop the ability to analyse ATD test data.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Understand the importance and limitations of ATD as human surrogates.	CbD, DAVMed, MCR	1
Knowledge of the design considerations and the live human and post mortem human subject test results used in the derivation of their data banks.	CbD, DAVMed, MCR	1
<b>Skills</b>		
A high standard of practice in the techniques used for analysing ATD test data.	DOPS, CbD, MCR	1
Be able to interpret recorded real time ATD data and correlate these data with human tolerance to injury.	DOPS, CbD, MCR	1
<b>Behaviours</b>		
An ability to identify injury critical issues and to facilitate any further investigations	DOPS, CbD, MCR	1

## Aircrew equipment assemblies and aircrew protective equipment

<b>To progressively develop the ability to demonstrate how design and test failings can influence the causation of injury.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Understand the function and importance of aircrew protective equipment.	CbD, DAVMed, MCR	1,2
Understand how the design considerations and any test failings can influence the causation of injury.	CbD, DAVMed, MCR	1,2
<b>Skills</b>		
A high standard of practice in the techniques used for analysing aircrew equipment assemblies.	DOPS, CbD, MCR	1,2
Relate the forensic findings of any system defects or failings with the injury causation.	DOPS, CbD, MCR	1,2
<b>Behaviours</b>		
Be objective and impartial in interpreting findings.	CbD, MCR	1
Be responsible for identifying the limitations any system and take ultimate responsibility for this.	CbD, MCR	1,2

## 20. Assessment of Aircrew Protective Helmets

### Principles of head protection

<b>To progressively develop the ability to analyse head protection systems.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
A wide knowledge of the energy attenuation mechanisms of helmets.	CbD, min-CEX, DAVMed, MCR	1,2
Knowledge of the literature relating to issues and to difficulties in assessing head protection systems.	CbD, min-CEX, DAVMed, MCR	1,2
Have a broad knowledge of techniques used to define helmet impact standards	CbD, min-CEX, DAVMed, MCR	1,2
<b>Skills</b>		
A high standard of practice in the techniques used for analysing head protection systems.	DOPS, CbD, min-CEX, MCR	1,2
<b>Behaviours</b>		
Be able to identify and address the issues raised by the system.	CbD, min-CEX, MCR	1
Be responsible for identification of the limitations and take responsibility for this.	CbD, min-CEX, MCR	1,2

### Head injury

<b>To progressively develop the ability to correlate clinical findings with the performance of head protection systems.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Have a thorough understanding of the clinical manifestations of head injury and the various imaging techniques and treatment modalities.	CbD, min-CEX, DAVMed, MCR	1
Wide knowledge of the causation mechanisms of head injury.	CbD, min-CEX, DAVMed, MCR	1
<b>Skills</b>		
Be able to interrogate the clinical records and understand the utility and limitations associated with various types of investigations including imaging and biochemistry.	DOPS, CbD, min-CEX, MCR	1,2
Be able to identify issues to be addressed from the clinical and post mortem examination.	DOPS, CbD, min-CEX, MCR	1,2
Be able to correlate the clinical findings with the injury mechanism to link in with the performance of head protection systems.	DOPS, CbD, min-CEX, MCR	1,2
<b>Behaviours</b>		
Be conversant with current clinical practice.	CbD, min-CEX, MCR	1
Be able to liaise with clinical colleagues in order to obtain clinical information during the assessments.	CbD, min-CEX, MSF, MCR	1

## Helmet impact testing

<b>To progressively develop the ability to be able to perform helmet impact tests.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Knowledge of the function of helmet drop test rigs, their limitations and their differences.	CbD, DAvMed, MCR	1
Knowledge of helmet impact test standard protocols and their application to head impact incident replication.	CbD, DAvMed, MCR	1
<b>Skills</b>		
Be able to perform helmet impact tests against test standards.	DOPS, CbD, MCR	1,2
Be able to perform head impact incident replications.	DOPS, CbD, MCR	1,2
Interpret findings and correlate with head injury causation mechanisms and clinical outcome.	DOPS, CbD, MCR	1,2
<b>Behaviours</b>		
Understand the need for helmet impact testing in the design of helmets and the need to correlate this with injury prevention in the flight environment.	CbD, MCR	1,2

## Procurement issues

<b>To progressively develop the ability to be competent in the legislative and duty of care issues involved in the procurement of safety systems.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Be familiar with the legislative and duty of care issues involved in the procurement of safety systems.	CbD, min-CEX, MCR	1
<b>Skills</b>		
Be conversant with current legislation and regulations relating to medico-legal aspects of duty of care and the role of military and civilian aviation and medical authorities in the provision of safety equipment.	CbD, min-CEX, MCR	1
<b>Behaviours</b>		
An impartial stance and a commitment to justification of any opinion from a balanced interpretation of medical and scientific evidence.	CbD, min-CEX, MCR	1

## 21. Post Accident Workspace (Cockpit) Assessments

### Cockpit and cabin environment

<b>To progressively develop the ability to evaluate the aircraft environment and formulate a management plan.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Describe the aircrew role in the cockpit and cabin environment.	CbD, min-CEX, DAvMed, MCR	1
Describe and understand the physiological effects of the cabin environment.	CbD, min-CEX, DAvMed, MCR	1
<b>Skills</b>		
Evaluate the aircraft environment concerned.	DOPS, CbD, MCR	1
Formulate a management plan based on the physical and physiological environment.	DOPS, CbD, MCR	1
<b>Behaviours</b>		
Recognise the impact of the assessment on the aircrew.	CbD, MCR	1

### Cockpit and cabin functional requirements

<b>To progressively develop the ability to carry out an accurate history and cockpit assessment.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Describe and understand the job specific role of aircrew in the cockpit and cabin environment.	CbD, DAvMed, MCR	1
Understand the physical and physiological demands of the job specific role of aircrew in the cockpit and cabin environment.	CbD, DAvMed, MCR	1
Describe and understand how post accident aircrew medical conditions and limitations can affect job specific performance.	CbD, DAvMed, MCR	1
<b>Skills</b>		
Elicit and record an accurate history and cockpit assessment.	DOPS, CbD, MCR	1
Record accurately clinical and technical findings, diagnosis and a post accident management plan	DOPS, CbD, MCR	1
Communicate findings clearly with aircrew and colleagues.	DOPS, CbD, MCR	1,3
<b>Behaviours</b>		
Recognise the importance of good communication and its contribution to multidisciplinary team-working.	CbD, MSF, MCR	1,3
Exhibit empathy in delivering a clear explanation of any disorder.	CbD, PS, MCR	1

### Consequences of injury

<b>To progressively develop the ability to assess and make recommendations on the fitness for task of post accident aircrew.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Describe and understand the consequence of impact and ejection	CbD, DAvMed, MCR	1

injuries to the short and long term employment of aircrew.		
Understand the aircrew role in assessing the fitness for task.	CbD, DAvMed, MCR	1
Understand and describe any increase in risk of aircrew returning to task post accident.	CbD, DAvMed, MCR	1
<b>Skills</b>		
Make recommendations on the fitness for task of post accident aircrew.	DOPS, CbD, MCR	1
Practice appropriate management.	DOPS, CbD, MCR	1
<b>Behaviours</b>		
Relate knowledge to aircrew aeromedical disposition and management	CbD, PS, MCR	1

## 22. Aircraft Crashworthiness and Survivability Assessments

### Aircraft structural container and injury causation

<b>To progressively develop the ability to be able to carry out cockpit structural assessments and identify hazards.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Understand the limitations on cockpit space and structural envelope surrounding the aircraft occupants.	CbD, DAvMed, MCR	1
Understand the concept of maximising impact energy absorbing capacity.	CbD, DAvMed, MCR	1
Describe how aircraft structures can cause injuries and understand how injuries can be minimised or eliminated.	CbD, DAvMed, MCR	1,2
<b>Skills</b>		
Be able to carry out cockpit structural assessments and be able to identify hazards.	DOPS, CbD, MCR	1,2
Be able to make recommendations to improve survivability and reduce injury severity.	DOPS, CbD, MCR	1,2
Be conversant with current legislation and regulations relating to aircraft safety systems.	DOPS, CbD, MCR	1,2
<b>Behaviours</b>		
An ability to identify flight safety issues and to facilitate any further investigations.	CbD, MCR	1
Be responsible for the identification of any limitations and take responsibility for them.	CbD, MCR	1

### Restraint systems and injury

<b>To progressively develop the ability to carry out assessments on the performance of restraint systems.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Understand the design principles of restraint systems.	CbD, DAvMed, MCR	1
Understand the injuries associated with particular restraint systems.	CbD, DAvMed, MCR	1
Understand how restraint systems prevent injury by mitigation of the deceleration forces.	CbD, DAvMed, MCR	1
Describe how the harness, harness attachments and buckle, and inertial real systems contribute to crash survivability.	CbD, DAvMed, MCR	1
<b>Skills</b>		
Be able to carry out assessments on the performance of restraint systems and be able to identify potential hazards.	DOPS, CbD, MCR	1
Be able to instrument restraint systems to measure the forces generated in impacts.	DOPS, CbD, MCR	1
Be able to interpret measured impact forces and relate to potential injuries and survivability outcome.	DOPS, CbD, MCR	1
<b>Behaviours</b>		



Be objective and impartial in interpreting findings.	CbD, MCR	1
Be responsible for identifying the limitations any system and take responsibility for this.	CbD, MCR	1

## Impact energy attenuation

<b>To progressively develop the ability to carry out assessments on the energy attenuation capabilities of seat systems.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Understand the principles of impact energy absorption and relate how the impact forces result in injury.	CbD, DAvMed, MCR	1
Understand that unoccupied areas should deform in a controlled manner to maximise energy absorption and limit forces on occupied areas.	CbD, DAvMed, MCR	1
Describe how seat orientation can influence human tolerance to injury.	CbD, DAvMed, MCR	1
<b>Skills</b>		
Be able to carry out assessments on the energy attenuation capabilities of seat systems and be able to identify potential hazards.	DOPS, CbD, MCR	1,2
Be conversant with current air standards and regulations relating to aircraft seat systems.	DOPS, CbD, MCR	1,2
<b>Behaviours</b>		
Be responsible for the identification of any non-conformity to seat standards and act responsibly in progressing improvement to crash survivability.	CbD, MCR	1,2

## Post crash survivability

<b>To progressively develop the ability to assess post crash survivability.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Describe the factors influencing post crash survivability including: exits, seating arrangements, post crash fire, land and sea survival, rescue, and medical response.	CbD, DAvMed, MCR	1
Understand how to improve survival and minimize injury post crash.	CbD, DAvMed, MCR	1
<b>Skills</b>		
Be able to carry out assessments of smoke hoods, emergency underwater breathing systems, survival equipment, and aircraft medical emergency packs.	DOPS, CbD, MCR	1,2
Be able to assess post crash survivability in hot, cold, land and sea environments.	DOPS, CbD, MCR	1
<b>Behaviours</b>		
Demonstrate a holistic approach to all aspects of post crash survivability.	CbD, MCR	1

## 23. Aircrew Equipment Integration

### Life support equipment (LSE) integration

<b>To progressively develop the ability to assess and integrate aircrew life support systems.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
The practical application of physiological, anatomical, anthropometric and medical knowledge to produce solutions to man-machine interface problems in highly complex aircraft cockpits.	CbD, DAVMed, MCR	1
Knowledge of the ability of the crewmember to carry out both routine and emergency procedures likely to be encountered during normal flight.	CbD, DAVMed, MCR	1
<b>Skills</b>		
Assessment of the fit and function of individual items of aircrew life support equipment (LSE).	DOPS, CbD, MCR	1
Investigate the relationship between aircrew body/body segment dimensions and cockpit geometry.	DOPS, CbD, MCR	1
Investigation, assessment and testing activities relevant to aircraft life support systems (LSS) and particularly the aircrew mounted components of the systems.	DOPS, CbD, MCR	1
Assessments of the integration of the crewmember with the aircraft cockpit.	DOPS, CbD, MCR	1
Assessment of test equipment required to support all aspects of aircrew LSE items.	DOPS, CbD, MCR	1
<b>Behaviours</b>		
Relate theoretical knowledge to practical application.	CbD, MCR	1
Be responsible for identifying the limitations any LSE and take responsibility for this.	CbD, MCR	1

### Aircrew anthropometry

<b>To progressively develop the ability to assess aircraft occupant anthropometry and cockpit space limitations.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Knowledge of anthropometry and cockpit space limitations	CbD, DAVMed, MCR	1
<b>Skills</b>		
Determination of body/body segment dimensions using aircrew anthropometry rigs.	DOPS, CbD, MCR	1
Assessment of individual aircraft cockpit workspaces to establish any size limitations which may be imposed on the aircrew population by specific dimensions of cockpit geometry.	DOPS, CbD, MCR	1
<b>Behaviours</b>		
Relate theoretical knowledge to practical application.	CbD, MCR	1

## LSE sizing

<b>To progressively develop the ability to assess sizing and functional fit of items of LSE.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Knowledge of the accuracy of sizing and functional fit of items of LSE.	CbD, DAVMed, MCR	1
<b>Skills</b>		
Demonstration of the satisfactory integration of individual items of LSE into various complete aircrew life support assemblies.	DOPS, CbD, MCR	1
Establish the specific don/doff procedures most appropriate to the function of the item of LSE or complete assembly consistent with the aircrew/aircraft role.	DOPS, CbD, MCR	1
<b>Behaviours</b>		
An ability to identify flight safety issues and to facilitate any further investigations.	CbD, MCR	1,2

## LSE integration data capture

<b>To progressively develop the ability to measure and record data from LSE integration assessments.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Knowledge of non-invasive data collection techniques.	CbD, DAVMed, MCR	1
<b>Skills</b>		
Recording of the comments (subjective impressions) of subjects and investigations.	DOPS, CbD, MCR	1
Measurement of body attitude in relation to fixed points in the aircraft cockpit, or on the ejection seat.	DOPS, CbD, MCR	1
Recording of internal and external visual fields on plan views of the cockpit/aircraft.	DOPS, CbD, MCR	1
Recording of subject and/or equipment movement by means of video, or cine camera systems.	DOPS, CbD, MCR	1
Measurement of breathing gas pressures and flows using transducers mounted on equipment components.	DOPS, CbD, MCR	1
<b>Behaviours</b>		
Recognise the impact of the assessment on the aircrew.	CbD, PS, MCR	1

## Emergency aircraft evacuation

<b>To progressively develop the ability to evaluate emergency aircraft evacuation.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Emergency aircraft evacuation	CbD, DAVMed, MCR	1
<b>Skills</b>		
Demonstration of routine and emergency ground egress drills, parachute suspension techniques, man-seat separation, and the aircraft seat inversion wheel.	DOPS, CbD, MCR	1

Understand how escape and impact forces will influence the protection and function of the integrated LSE.	DOPS, CbD, MCR	1
<b>Behaviours</b>		
Recognise the impact of the assessment on the aircrew and the contribution to aircrew survivability.	CbD, PS, MCR	1

## 24. Aviation Psychology and the Investigation of Human Factor Incidents

### Human error

To progressively develop the ability to describe the factors influencing human performance and the use of human error classification systems.		
Knowledge	Assessment Methods	GMP
Understand the methods used to assess the nature of errors and reasons under-pinning them.	CbD, DAvMed, MCR	1
Understand the basics of behavioural, cognitive, systemic and psychodynamic models.	CbD, DAvMed, MCR	1
Skills		
Demonstrate the use of human error classification systems.	DOPS, CbD, MCR	1
Describe the factors influencing human performance and error, including the effects of fatigue, stress, individual differences and medical conditions.	DOPS, CbD, MCR	1
Behaviours		
An ability to identify flight safety issues and to facilitate any further investigations.	CbD, MCR	1

### Safety and risk

To progressively develop the ability to describe the personal and organisation factors that affect safety.		
Knowledge	Assessment Methods	GMP
Knowledge of the personal and organisation factors that affect safety, and understand how these factors can be managed to reduce the overall level of risk.	CbD, DAvMed, MCR	1, 2
Skills		
Demonstrate the concept of risk as the product of event frequency and the application of <i>as low as reasonably practical</i> criteria (or likelihood and severity) to safety decision making.	DOPS, CbD, MCR	1, 2
Understand safety and risk analysis, nature and location of aircraft accidents, benefits of aircraft warning systems, and reporting systems.	DOPS, CbD, MCR	1, 2
Behaviours		
Demonstrate willingness to recommend action and liaise with technical colleagues to reduce risk.	CbD, MCR	1, 2

### Cockpit workspace

To progressively develop the ability to assess the human factors issues associated with the design of flight decks.		
Knowledge	Assessment Methods	GMP

Understand the human factors issues associated with the design of modern, highly automated, flight decks; the human factors considerations in the design of passenger cabins for safety and comfort and the design of cabin crew workplaces.	CbD, DAVMed, MCR	1
<b>Skills</b>		
Describe the principles of display design, the design options for minor controls and the design of primary flight controls.	DOPS, CbD, MCR	1
Understand the importance of auditory and visual warning and alerting systems.	DOPS, CbD, MCR	1,2
Understand the problems and benefits of automation on the flight deck.	DOPS, CbD, MCR	1
Understand the requirements for the passenger cabin and the associated effects on safety, comfort and wellbeing.	DOPS, CbD, MCR	1,2
Describe how the design of cabin crew workstations can promote safe and efficient working practices and minimisation of hazards.	DOPS, CbD, MCR	1
<b>Behaviours</b>		
An ability to identify flight safety issues and to facilitate any further investigations.	CbD, MCR	1

### Crew Resource Management (CRM)

<b>To progressively develop the ability to deliver and enhance crew and management awareness of human factors.</b>		
	<b>Assessment Methods</b>	<b>GMP</b>
<b>Knowledge</b>		
Deliver and enhance crew and management awareness of human factors that could cause or exacerbate air incidents.	CbD, DAVMed, MCR	1,2,3
Knowledge of CRM skills and attitudes to aircraft operations and their integration within the organisational culture.	CbD, DAVMed, MCR	1,2
<b>Skills</b>		
Demonstrate skills and attitudes including communication, situational awareness, problem solving, decision making, and teamwork; together with the entire attendant sub-disciplines which each of these areas entail.	DOPS, CbD, MCR	1,2
Describe the cognitive and interpersonal skills needed to manage the flight within an organised aviation system.	DOPS, CbD, MCR	1,2,3
<b>Behaviours</b>		
An ability to identify flight safety issues and to facilitate any further investigations.	CbD, MCR	1,2
Recognise the impact of the assessment on the aircrew.	CbD, PS, MCR	1,2

## 25. Thermal Evaluation of Aircrew and Aircrew Equipment Assembly Performance

### Thermal environment and heat balance

To progressively develop the ability to assess thermal balance and heat in the aviation environment.		
Knowledge	Assessment Methods	GMP
Knowledge of thermal balance and the sources of heat in the aviation environment.	CbD, DAvMed, MCR	1
Knowledge of cabin conditioning systems and personal cooling systems including liquid and air cooling.	CbD, DAvMed, MCR	1
Skills		
Apply the heat balance equation in the aviation environment.	DOPS, CbD, MCR	1
Assess the effectiveness of aircrew and cabin cooling systems.	DOPS, CbD, MCR	1
Behaviours		
An ability to identify the contribution of thermal burden on aircrew performance and flight safety, and to facilitate any further investigations.	CbD, MCR	1

### Body temperature and thermoregulatory response and thermal injury

To progressively develop the ability to assess heat regulation in the body.		
Knowledge	Assessment Methods	GMP
Knowledge of the physiology of heat regulation in the body.	CbD, DAvMed, MCR	1
Knowledge of hypothermia and cold injuries.	CbD, DAvMed, MCR	1
Knowledge of hyperthermia.	CbD, DAvMed, MCR	1
Skills		
Demonstrate knowledge and practical application of treatment of heat stress illness.	DOPS, CbD, MCR	1,2
Demonstrate knowledge and practical application of treatment of freezing cold injury and non-freezing cold injury.	DOPS, CbD, MCR	1,2
Demonstrate practical application for prevention and protection against cold injury.	DOPS, CbD, MCR	1,2
Understand the problems associated with aircrew survivability in hot and cold environments.	DOPS, CbD, MCR	1,2
Behaviours		
Ability to support and work with others in the management of thermal injury.	CbD, MSF, MCR	1,2

### Heat stress indices

To progressively develop the ability to apply hot and cold heat stress indices to the assessment of aircrew performance.		
Assessment	GMP	

Knowledge	Methods	
Understanding of hot and cold heat stress indices, their practical application, and their role in assessing aircrew performance and equipment selection.	CbD, DAVMed, MCR	1
Skills		
Demonstrate knowledge of the physiologic basis of heat stress indices.	DOPS, CbD, MCR	1
Calculate heat stress indices.	DOPS, CbD, MCR	1
Demonstrate the practical application of heat stress indices.	DOPS, CbD, MCR	1
Use heat stress indices to evaluate thermal burden in the prevention of hypothermic and hyperthermic illness.	DOPS, CbD, MCR	1
Use heat stress indices for aircrew schedule rostering in hot and cold environments.	DOPS, CbD, MCR	1
Behaviours		
An ability to identify the contribution of thermal burden on aircrew performance and flight safety, and to facilitate any further investigations.	CbD, MCR	1

### Climatic chambers

To progressively develop the ability to conduct thermal evaluation trials.		
Knowledge	Assessment Methods	GMP
Operation and function of climatic chambers.	CbD, DAVMed, MCR	1
Ability to provide medical cover for thermal research studies and trials.	CbD, DAVMed, MCR	1
Knowledge and practical application of thermal measurement - environmental and physiological.	CbD, DAVMed, MCR	1
Skills		
Conduct thermal evaluation trials and assess aircrew equipment assemblies' thermal burden.	DOPS, CbD, MCR	1
Assess Clo value of aircrew clothing.	DOPS, CbD, MCR	1
Assess thermal stress mitigation capabilities and strategies.	DOPS, CbD, MCR	1
Generate accurate and scientifically valid protocols to investigate the thermal issues of flight.	DOPS, CbD, MCR	1
Behaviours		
Understand analytical and practical limitations of techniques.	CbD, MCR	1

### Effect of hot and cold stress on aircrew performance and operations

To progressively develop the ability to assess how thermal issues relate to crew performance.		
Knowledge	Assessment Methods	GMP
Knowledge of human effectiveness and performance in adverse thermal environments.	CbD, DAVMed, MCR	1
Knowledge of how human performance measures and rating scales can be used to assess the risk to flight safety in adverse thermal	CbD, DAVMed, MCR	1



environments.

**Skills**

Understand how thermal issues relate to crew performance and the contribution towards effective aircraft operations. DOPS, CbD, MCR 1

Demonstrate how increased thermal burden can compromise flight safety. DOPS, CbD, MCR 1

**Behaviours**

Provide safe and accurate assessment of thermal risk in operational and working environments. CbD, MCR 1,2

Educate other aviation workers and management on improving understanding of thermal issues CbD, MCR 1

## 26. Assessment of Hearing Protection and In-Flight Noise

### Hearing protection and in-flight noise monitoring

<b>To progressively develop the ability to carry out and interpret a noise risk assessment in the aircraft environment.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Knowledge of how to carry out a noise risk assessment in the aircraft environment, and determine the headset communications intelligibility and attenuation levels offered by hearing protectors.	CbD, mini-CEX, DAVMed, MCR	1
Understand the occupational noise exposure limits especially Control of Noise at Work Regulations.	CbD, mini-CEX, DAVMed, MCR	1
<b>Skills</b>		
Determine the attenuation provided by aural personal protective equipment and the effectiveness of communication headsets/helmets for use by aircrew.	DOPS, CbD, mini-CEX, MCR	1
Determined the occupational noise exposure of personnel at risk of noise induced hearing loss.		1,2
<b>Behaviours</b>		
Provide an impartial assessment based on rigorous scientific methods, in a safe manner, to enable evidence based decisions on hearing protection to be made.	CbD, mini-CEX, MCR	1,2

### Role of hearing protection in mitigating the effects of aircraft noise exposure

<b>To progressively develop the ability to assess hearing protection.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
A comprehensive understanding of the effects of noise exposure on hearing and how personal protective equipment minimises these effects.	CbD, mini-CEX, DAVMed, MCR	1
Understand the importance of a holistic approach to mitigating noise induced hearing loss.	CbD, mini-CEX, DAVMed, MCR	1
<b>Skills</b>		
Show how hearing protection works and the limitations of personal hearing protection equipment.	DOPS, CbD, mini-CEX, MCR	1
Describe how the psychological effects of noise exposure can alter aircrew performance.	DOPS, CbD, mini-CEX, MCR	1
<b>Behaviours</b>		
Have a balanced view over the compromises required when providing individuals with personal hearing protection equipment.	CbD, mini-CEX, PS, MCR	1
Be responsible for identifying whether the hearing protection offers adequate protection to prevent noise induced hearing loss.	DOPS, CbD, mini-CEX, MCR	1

## In-flight and audio booth monitoring of noise during hearing protection and speech intelligibility assessments

<b>To progressively develop the ability to conduct a functional assessments of human performance during noise exposure.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
The practical application of the physiology of hearing and medical knowledge to ensure that personal hearing protection minimises noise induced hearing loss.	CbD, min-CEX, DAVMed, MCR	1
Understand the various modalities of speech intelligibility to assess the performance and limitations of communications equipment.	CbD, min-CEX, DAVMed, MCR	1
<b>Skills</b>		
Conduct an assessment of the fit and function of hearing protection and communications intelligibility in the real flight and simulated environment.	DOPS, CbD, min-CEX, MCR	1,2
Conduct functional assessments of human performance during noise exposure.	DOPS, CbD, min-CEX, MCR	1
<b>Behaviours</b>		
Demonstrate an understanding of the physiological principles underlying the monitoring techniques used.	CbD, min-CEX, MCR	1

## Reporting of findings

<b>To progressively develop the ability to write a report based on the findings of the assessment, with recommendations.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Have knowledge of aircrew equipment procurement organisations and responsible bodies.	CbD, mini-CEX, DAVMed, MCR	1
Understand appropriate format and channels for reporting.	CbD, mini-CEX, DAVMed, MCR	1
<b>Skills</b>		
Write a report based on the findings of the assessment, with recommendations.	DOPS, CbD, mini-CEX, MCR	1
Produce finished reports in a timely way.	DOPS, CbD, mini-CEX, MCR	1
Produce reports to a high standard of clarity and accuracy, comparable with those in peer reviewed scientific literature.	DOPS, CbD, mini-CEX, MCR	1
<b>Behaviours</b>		
Provide a sound basis for financial and policy decisions relating to personal protective equipment for aircrew.	CbD, mini-CEX, MCR	1
Ensure there is an acceptable compromise between protection and performance limitations, and take responsibility for decisions taken.	CbD, mini-CEX, MCR	1

## 27. Assessment of Aircraft Vibration and its Effect on the Human

### Vibration protection and in-flight vibration monitoring

To progressively develop the ability to carry out and interpret a vibration risk assessment.		
Knowledge	Assessment Methods	GMP
Knowledge of how to carry out a vibration risk assessment in the aircraft environment and determine the protection offered by vibration isolating devices.	CbD, mini-CEX, DAVMed, MCR	1
Understand the occupational vibration exposure limits especially Control of Vibration at Work Regulations.	CbD, mini-CEX, DAVMed, MCR	1
Skills		
Determined the occupational vibration exposure of personnel at risk of whole body vibration.	DOPS, CbD, mini-CEX, MCR	1
Determine the attenuation provided by in cockpit vibration isolation devices.	DOPS, CbD, mini-CEX, MCR	1
Behaviours		
Provide an impartial assessment based on rigorous scientific methods, in a safe manner, to enable evidence based decisions on vibration protection to be made.	CbD, mini-CEX, MCR	1

### Role of vibration protection in mitigating the effects of aircraft vibration exposure

To progressively develop the ability to assess the effects of vibration exposure on the body.		
Knowledge	Assessment Methods	GMP
A comprehensive understanding of the effects of vibration exposure on the body, including the respiratory neuromuscular and cardiovascular systems and how protective equipment can increase human tolerance to vibration.	CbD, mini-CEX, DAVMed, MCR	1
Understand the effect of vibration on motion sickness.	CbD, mini-CEX, DAVMed, MCR	1
Skills		
Show how vibration protection works and the limitations of vibration isolation devices including seat protective equipment.	DOPS, CbD, mini-CEX, MCR	1,2
Describe how the debilitating effects of vibration exposure can alter aircrew task performance.	DOPS, CbD, mini-CEX, DAVMed, MCR	1,2
Behaviours		
Have a balanced view over the compromises required when providing vibration protective devices.	CbD, mini-CEX, MCR	1
Be responsible for identifying whether the vibration protection offers adequate protection vibration.	CbD, mini-CEX, MCR	1

## In-flight monitoring of vibration and vibration rig assessments of aircrew at risk from whole body vibration exposure

<b>To progressively develop the ability to assess the fit and function of vibration protection and communications intelligibility.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
The practical application of the physiology of vibration and medical knowledge to ensure that personal vibration protection minimises noise induced vibration loss.	CbD, mini-CEX, DAVMed, MCR	1
Understand the various modalities of speech intelligibility to assess the performance and limitations of communications equipment.	CbD, mini-CEX, DAVMed, MCR	1
<b>Skills</b>		
Conduct an assessment of the fit and function of vibration protection and communications intelligibility in the real flight and simulated environment.	DOPS, CbD, mini-CEX, MCR	1, 2
Conduct functional assessments of human performance during vibration exposure.	DOPS, CbD, mini-CEX, MCR	1,2
<b>Behaviours</b>		
Demonstrate an understanding of the physiological principles underlying the monitoring techniques used.	CbD, mini-CEX, MCR	1

## Reporting of findings

<b>To progressively develop the ability to write a report based on the findings of the assessment, with recommendations.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Have knowledge of aircrew equipment procurement organisations and responsible bodies.	CbD, mini-CEX, MCR	1
Understand appropriate format and channels for reporting.	CbD, mini-CEX, MCR	1
<b>Skills</b>		
Write a report based on the findings of the assessment, with recommendations.	DOPS, CbD, mini-CEX, MCR	1
Produce finished reports in a timely way.	DOPS, CbD, mini-CEX, MCR	1
Produce reports to a high standard of clarity and accuracy, comparable with those in peer reviewed scientific literature.	DOPS, CbD, mini-CEX, MCR	1
<b>Behaviours</b>		
Provide a sound basis for financial and policy decisions relating to personal protective equipment for aircrew.	CbD, mini-CEX, MCR	1
Ensure there is an acceptable compromise between protection and performance limitations, and take responsibility for decisions taken.	CbD, mini-CEX, MCR	1

## Motion sickness

<b>To progressively develop the ability to assess motion sickness and conduct a desensitisation programme.</b>		
	<b>Assessment</b>	<b>GMP</b>

<b>Knowledge</b>		<b>Methods</b>	
Knowledge of the theories of the aetiology of motion sickness.	CbD, mini-CEX, DAvMed, MCR	1	
Knowledge of the effect of motion sickness on aircrew performance.	CbD, mini-CEX, DAvMed, MCR	1	
Knowledge of prevention strategies for motion sickness	DOPS, CbD, mini-CEX, DAvMed, MCR	1	
<b>Skills</b>			
Describe the neural mismatch theories of motion sickness causation.	DOPS, CbD, mini-CEX, MCR	1	
Describe the pharmacological and behavioural measures to prevent motion sickness	DOPS, CbD, mini-CEX, MCR	1	
Conduct the ground based phases of a motion sickness desensitisation programme.	DOPS, CbD, mini-CEX, MCR	1	
<b>Behaviours</b>			
Show empathy with those who potentially may lose their flying category.	CbD, min-CEX, PS, MCR	1	

## 28. Situational Awareness and Spatial Disorientation

### Spatial awareness

<b>To progressively develop the ability to assess situational awareness and its loss.</b>		
	<b>Assessment Methods</b>	<b>GMP</b>
<b>Knowledge</b>		
Knowledge of how the human maintains spatial awareness.	CbD, mini-CEX, DAvMed, MCR	1
Knowledge of the orientation sensory systems: vestibular and otolith systems.	CbD, mini-CEX, DAvMed, MCR	1
Knowledge of how disease processes can affect spatial orientation	CbD, mini-CEX, DAvMed, MCR	1
<b>Skills</b>		
Describe how situational awareness is maintained in-flight.	DOPS, CbD, mini-CEX, MCR	1
Describe the human's systems used for maintaining spatial orientation.	DOPS, CbD, mini-CEX, MCR	1
Describe the technological systems which can augment the human's perception of spatial awareness.	DOPS, CbD, mini-CEX, MCR	1
Recognise the clinical conditions adversely affecting spatial orientation.	DOPS, CbD, mini-CEX, MCR	1
<b>Behaviours</b>		
Show good judgement on which clinical conditions may impact on human spatial orientation, and which may place individuals at increased risk.	CbD, mini-CEX, MCR	1
Use all appropriate tools for accurate clinical assessment and to ensure patient safety.	CbD, mini-CEX, MCR	1

### Disorientation in flight

<b>To progressively develop the ability to understand and assess disorientation in flight.</b>		
	<b>Assessment Methods</b>	<b>GMP</b>
<b>Knowledge</b>		
Knowledge of how orientation can lead to errors in flight.	CbD, min-CEX, DAvMed, MCR	1
Understand how false perception of attitude and linear motion leads to disorientation.	CbD, min-CEX, DAvMed, MCR	1
Understand how false perception of angular motion leads to disorientation.	CbD, min-CEX, DAvMed, MCR	1
Understand how the common in-flight illusions lead to disorientation.	CbD, min-CEX, DAvMed, MCR	1
Understand how dissociative sensations lead to disorientation.	CbD, min-CEX, DAvMed, MCR	1
<b>Skills</b>		
Describe the neurological basis for the perception of orientation and how this is modified in cases of spatial disorientation.	DOPS, CbD, min-CEX, MCR	1

Describe how the effects of false perception of orientation can alter aircrew performance.	DOPS, CbD, min-CEX, MCR	1
Describe and demonstrate the typical illusions encountered in-flight.	DOPS, CbD, min-CEX, MCR	1
<b>Behaviours</b>		
Provide an impartial assessment based on rigorous scientific methods, in a safe manner, to enable evidence based decisions to be made.	CbD, min-CEX, MCR	1

## Prevention of disorientation

### To progressively develop the ability to be competent in the teaching of disorientation countermeasures to aircrew.

	Assessment Methods	GMP
<b>Knowledge</b>		
Understand the techniques and systems available to aircrew to augment spatial awareness.	CbD, min-CEX, DAvMed, MCR	1
Understand how disorientation simulation trainers can be used to teach aircrew methods to prevent in-flight disorientation incidents.	CbD, min-CEX, DAvMed, MCR	1
<b>Skills</b>		
Be competent in the teaching of disorientation countermeasures to aircrew.	DOPS, CbD, min-CEX, MCR	1
Demonstrate the use of common illusions and examples of disorientation incidents in disorientation simulation trainers.	DOPS, CbD, min-CEX, MCR	1
Describe the techniques and systems available to aircrew to augment spatial awareness.	DOPS, CbD, min-CEX, MCR	1
<b>Behaviours</b>		
Be an effective trainer to ensure the safety of aircrew.	CbD, min-CEX, MCR	1
Identify areas where research may improve spatial orientation.	CbD, min-CEX, MCR	1
Ensure there is an acceptable compromise between protection and performance limitations, and take ultimate responsibility for decisions taken.	CbD, min-CEX, MCR	1

## Investigation of disorientation incidents

### To progressively develop the ability to be able to identify and address the issues raised by disorientation incidents.

	Assessment Methods	GMP
<b>Knowledge</b>		
Understand the physical and physiological demands of the job specific role of aircrew and how this influences spatial orientation.	CbD, min-CEX, DAvMed, MCR	1
Understand the methods used to assess the nature of spatial orientation and reasons under-pinning them.	CbD, min-CEX, DAvMed, MCR	1
Have an understanding of the use of clinical information and the health record of those involved and understand the limitations on dissemination of clinical information to third parties.	CbD, min-CEX, DAvMed, MCR	1
<b>Skills</b>		
Ability to retrieve and trace evidence, and formulate strategies for	DOPS, CbD, min-	1



appropriate investigation and prioritisation of activities.	CEX, MCR	
Be able to interrogate the clinical records and understand the utility and limitations associated with various types of investigation.	DOPS, CbD, min-CEX, MCR	1
<b>Behaviours</b>		
Be able to identify and address the issues raised by the disorientation incident.	CbD, min-CEX, MCR	1
An ability to identify flight safety issues and to facilitate any further investigations.	CbD, min-CEX, MCR	1
Be responsible for identification of the incident causation and take ultimate responsibility for this.	CbD, min-CEX, MCR	1

## 29. Vision and Optical Systems

### Vision

<b>To progressively develop the ability to describe how vision can affect the performance of aircrew.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
A comprehensive understanding of the visual system, how it functions and how it is affected in-flight.	CbD, DAvMed, MCR	1
Knowledge of aviation hazards to vision.	CbD, DAvMed, MCR	1
<b>Skills</b>		
Demonstrate knowledge and practical application of vision in-flight.	DOPS, CbD, MCR	1
Describe how vision can affect the performance of aircrew	DOPS, CbD, MCR	1
<b>Behaviours</b>		
Demonstrate an understanding of the physiology of vision.	CbD, MCR	1

### Visual acuity and fields

<b>To progressively develop the ability to assess vision.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Knowledge of how to examine the eye.	CbD, min-CEX, DAvMed, MCR	1
Knowledge of visual acuity and visual fields.	CbD, min-CEX, DAvMed, MCR	1
Knowledge of the principles of the assessment of contrast sensitivity.	CbD, min-CEX, DAvMed, MCR	1
<b>Skills</b>		
Perform an examination of the external eye, ocular adnexae, eyelids and orbits using appropriate equipment and illumination.	DOPS, CbD, min-CEX, MCR	1
Assess visual acuity for near and distance using appropriate methods and interpret the results.	DOPS, CbD, min-CEX, MCR	1
Awareness of and be able to interpret and apply newer methods of assessing visual acuity when they are introduced into clinical practice.	DOPS, CbD, min-CEX, MCR	1
Ability to test colour vision using an appropriate method and interpret the results.	DOPS, CbD, min-CEX, MCR	1
Assessment of normal and abnormal visual fields using an appropriate method.	DOPS, CbD, min-CEX, MCR	1
Awareness of the reliability of the methods of visual fields assessment and know when to arrange for more detailed visual field analysis.	DOPS, CbD, min-CEX, MCR	1
<b>Behaviours</b>		
Be conversant with current clinical ophthalmologic practice.	CbD, min-CEX, MCR	1
Be able to liaise with ophthalmologic colleagues in order to obtain clinical information during the assessments.	CbD, min-CEX, MCR	1,3

## Vision and licensing

**To progressively develop the ability to interpret the results of vision investigations and examinations, and assess functional prognosis for licensing gain/retention.**

<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Define the pathophysiological basis of visual signs and symptoms.	CbD, mini-CEX, DAvMed, MCR	1
Define the pathophysiological basis of vision investigations, including those relevant to aviation, and functional prognosis.	CbD, mini-CEX, DAvMed, MCR	1
Knowledge of the vision limitations for licensing in the civilian and military environment.	CbD, mini-CEX, DAvMed, MCR	1
<b>Skills</b>		
Interpret the results of investigations and examinations, and assess functional prognosis for licensing gain/retention.	DOPS, CbD, mini-CEX, MCR	1
<b>Behaviours</b>		
Show a willingness to provide explanation to the patient as to rationale for investigations, treatment, such as refractive surgery, and possible unwanted effects.	CbD, mini-CEX, MCR	1
Be responsible for identifying any visual condition and associated licensing implications and take responsibility for these.	CbD, mini-CEX, MCR	1
Be objective and impartial in interpreting findings.	CbD, mini-CEX, MCR	1

## Optical devices

**To progressively develop the ability to show how vision protection works and the limitations of protection equipment and enhancement.**

<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Knowledge of vision enhancing devices including day and night sighting systems.	CbD, mini-CEX, DAvMed, MCR	1
Knowledge of vision protection devices including solar glare, blast and laser eye protection.	CbD, mini-CEX, DAvMed, MCR	1
<b>Skills</b>		
Show how vision protection works and the limitations of protection equipment.	DOPS, CbD, mini-CEX, MCR	1
Describe how vision enhancement can alter aircrew performance.	DOPS, CbD, mini-CEX, MCR	1
Demonstrate the limitations of vision enhancement systems.	DOPS, CbD, mini-CEX, MCR	1
Conduct an assessment of the fit and function of vision enhancing devices in the real flight and simulated environment.	DOPS, CbD, mini-CEX, MCR	1
<b>Behaviours</b>		
Demonstrate an understanding of the physiological principles underlying the techniques used.	CbD, mini-CEX, MCR	1
Have a balanced view over the compromises required when providing individuals with vision enhancing and protecting equipment.	CbD, mini-CEX, MCR	1,3,4

## 30. Aeromedical Evacuation and Patient Transfer

### Requirements for patient transfers

<b>To progressively develop the ability to aeromedically evacuate patient safely.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Understanding the factors influencing the decision to transfer patients and the classification categories of patients for aeromedical evacuation.	CbD, mini-CEX, DAvMed, MCR	1
Knowledge of the composition of the transfer team and the requirements of civilian and military patient transfers.	CbD, mini-CEX, DAvMed, MCR	1
<b>Skills</b>		
Describe the categorisation of patients for aeromedical evacuation in terms of priority and dependency.	CbD, mini-CEX, MCR	1
Describe the advantages, disadvantages and hazards of aeromedical evacuation.	CbD, mini-CEX, MCR	1
Demonstrate a capability to make informed decisions on the need for patient transfers.	CbD, mini-CEX, MCR	1,2
Describe the types of aeromedical evacuation in terms of forward, tactical and strategic in the military and civilian environment.	CbD, mini-CEX, MCR	1
<b>Behaviours</b>		
Provide a sound basis for the decision to transfer patients.	CbD, MSF, mini-CEX, MCR	1,3,4
Work effectively and in conjunction with aeromedical and ground medical teams.	CbD, MSF, mini-CEX, MCR	1,3,4

### Patient and medical preparation

<b>To progressively develop the ability to identify the essential data and requirements for safe and effective aeromedical transfers.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Understand the requirements of the pre-flight preparation of the patient.	CbD, mini-CEX, DAvMed, MCR	1
Understand the pre-existing clinical conditions, the relative contraindications to transfer and the presentation of particular difficulties which may be encountered during transfers.	CbD, mini-CEX, DAvMed, MCR	1
Understand the factors which influence the choice of aircraft for aeromedical evacuation	CbD, mini-CEX, DAvMed, MCR	1
<b>Skills</b>		
Describe and identify the pre-flight investigations and essential data required for safe and effective aeromedical transfers.	CbD, mini-CEX, MCR	1,3,4
Describe the aircraft/rotorcraft limitations for aeromedical transfer.	CbD, mini-CEX, MCR	1,3,4
Describe how to assess the patient and identify the clinical conditions present in order to stabilise or improve the patient's condition throughout the flight	CbD, mini-CEX, DOPS, MCR	1,3,4
<b>Behaviours</b>		

Demonstrate an understanding of and ability to detect medical conditions prohibiting or permitting aeromedical transfer.	CbD, mini-CEX, MCR	1,3
Ensure there is an acceptable compromise/benefit between transferring a patient and leaving in situ and take responsibility for decisions taken.	CbD, PS, mini-CEX, MCR	1,3

## Equipment

<b>To progressively develop the ability to demonstrate an understanding of in-flight medical equipment.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Understand the rationale behind the aviation standards relevant to aeromedical equipment.	CbD, DAvMed, MCR	1
Understand the characteristics of ideal transfer equipment.	CbD, DAvMed, MCR	1
Understand the principles of monitoring and maintenance of the equipment during flight.	CbD, DAvMed, MCR	1
Understand the difficulties of connections to the aircraft power supplies.	CbD, DAvMed, MCR	1
<b>Skills</b>		
Demonstrates an understanding of the limitations and capabilities of in-flight medical equipment.	DOPS, CbD, MCR	1,2
<b>Behaviours</b>		
Understand how to use in-flight medical equipment safely and effectively.	CbD, MCR	1,2

## Aeromedical considerations

<b>To progressively develop the ability to demonstrate how the environment can influence the physiology and pathology of disease processes.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Understand the aeromedical considerations for the patient regarding altitude, temperature, noise, air sickness, vibration and movement, visibility for medical staff and communication.	CbD, mini-CEX, DAvMed, MCR	1
Understanding of the availability of in-flight resources and the influence on patient transfer and care.	CbD, mini-CEX, DAvMed, MCR	1
Understand the importance of the administration of medication during transit through different time zones.	CbD, mini-CEX, DAvMed, MCR	1
Understand the effects of flight on the pathology of the various systems.	CbD, mini-CEX, DAvMed, MCR	1
Understand the principles of transfer of patients with infectious diseases and those suffering from biological and chemical agents.	CbD, mini-CEX, DAvMed, MCR	1
Understand the principles for the aeromedical transfer of the critically ill patient.	CbD, mini-CEX, DAvMed, MCR	1
<b>Skills</b>		
Describe how the changes in the environment can influence the physiology and pathology of disease processes.	DOPS, CbD, mini-CEX, MCR	1

Describe the principles and practicalities of using a patient isolator and the hazards associated with transporting patients suffering from infectious, biological and chemical agents.	DOPS, CbD, mini-CEX, MCR	1,2
Demonstrate an understanding of the limitations on patient care in the flight environment.	DOPS, CbD, mini-CEX, MCR	1,2
Describe the neurovascular, cardiovascular, respiratory, haematological, gastrointestinal, orthopaedic, psychiatric, and ophthalmic conditions which can be affected by aeromedical evacuation.	DOPS, CbD, mini-CEX, MCR	1,2
<b>Behaviours</b>		
Have a balanced view over the compromises which may be required for aeromedical transportation of patients.	CbD, PS, mini-CEX, MCR	1,2,3
Recognise the valuable contribution aeromedical transfers can have in the morbidity and mortality outcome for patients.	CbD, PS, MSF, MCR	1,2,4

## 31. Space Medicine

### Immediate physiological and pathological problems of manned space flight

<b>To progressively develop the ability to assess pathophysiological challenges of the space environment.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Understand the problems associated with decreased pressure with the consequent risk of hypoxia, decompression sickness, ebullism, barotrauma and thermal injury.	CbD, DAvMed, MCR	1
Understand the problems associated with the accelerations of launch, atmospheric re-entry and landing.	CbD, DAvMed, MCR	1
Understand the principles relating to nutrition, fluid balance, waste management and personal hygiene.	CbD, DAvMed, MCR	1
<b>Skills</b>		
Describe the physiological consequences of decreased pressure, and in particular relate these to the space environment over those encountered in the aviation flight environment.	CbD, MCR	1
Demonstrate an ability to evaluate the dynamic and acceleration problems of space flight and demonstrate the knowledge needed to sustain astronauts in hermetically sealed environments.	CbD, MCR	1
Demonstrate an understanding of the medical requirements and consequences for sub-orbital space tourism.	CbD, MCR	1
<b>Behaviours</b>		
Show good judgement on which clinical conditions may impact on human space exploration (and space tourism), and which environmental and dynamic hazards may place individuals at increased risk.	CbD, MCR	1,2
Have a balanced view over the compromises required on the provision of protective systems for space flight and the differing medical and certification requirements for professional astronauts and space tourists.	CbD, MCR	1,2

### Long-term physiological and pathological problems of manned space flight

<b>To progressively develop the ability to assess how microgravity influences space adaption.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Understand the problems associated with decreased accelerations (microgravity) with specific reference to the effects on the cardiovascular, neurovestibular and musculoskeletal systems.	CbD, DAvMed, MCR	1
Understand the various mechanisms and countermeasures available to minimise the effects of long duration space flights.	CbD, DAvMed, MCR	1
Demonstrate a knowledge of the cardiovascular, neurovestibular and musculoskeletal changes associated with long duration space flight.	CbD, DAvMed, MCR	1
Demonstrate a knowledge of the limitations of medical intervention in	CbD, DAvMed, MCR	1

a microgravity environment.		
<b>Skills</b>		
Describe how microgravity influences the Space Adaption Syndrome.	CbD, MCR	1
<b>Behaviours</b>		
Be able to identify and address the issues raised by long duration space flight.	CbD, MCR	1
Be responsible for identification of the limitations on human performance and take responsibility for this.	CbD, MCR	1,2

## Spacecraft and suit pressurisation

<b>To progressively develop the ability to demonstrate an understanding of the protection requirements for space flight.</b>		
	<b>Assessment Methods</b>	<b>GMP</b>
<b>Knowledge</b>		
Understand the requirements for space craft and space suit pressurisation schedules.	CbD, DAVMed, MCR	1
Understand the protection requirements for portable life support systems for extra-vehicular activities (space walks).	CbD, DAVMed, MCR	1
<b>Skills</b>		
Describe the principles of space craft and space suit pressurisation schedules.	CbD, MCR	1,2
Demonstrate and understanding of the protection requirements for portable life support systems for extra-vehicular activities.	CbD, MCR	1,2
<b>Behaviours</b>		
Be responsible for identifying whether pressurisation and life support systems offers adequate protection for professional astronauts and space tourists.	CbD, MCR	1,2

## Ionising radiation and micrometeoroids

<b>To progressively develop the ability to assess the hazards of radiation and micrometeoroids.</b>		
	<b>Assessment Methods</b>	<b>GMP</b>
<b>Knowledge</b>		
Understand the consequence of ionising radiation for sub-orbital, orbital and Luna (interplanetary) space flights.	CbD, DAVMed, MCR	1
Understand the different types of radiation to which astronauts may be exposed and the biological effects of exposure.	CbD, DAVMed, MCR	1
Understand the principle of protecting astronauts from the effects of radiation in space craft and space suits.	CbD, DAVMed, MCR	1
Understand the principle of protection from micrometeoroids during extra-vehicular activities.	CbD, DAVMed, MCR	1
<b>Skills</b>		
Assess and demonstrate a knowledge of the types of radiation and the biological effects of exposure.	CbD, MCR	1
Assess and demonstrate the cumulative effects of exposure to ionising radiation.	CbD, MCR	1



<b>Behaviours</b>		
Have a balanced view over the compromises required when providing individuals with protection from radiation.	CbD, MCR	1
Be responsible for identifying whether the radiation and micrometeoroid protection offers adequate shielding for biological tissues.	CbD, MCR	1

## **Behavioural**

<b>To progressively develop the ability to assess the behavioural consequences of prolonged space flight.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Understand the psychological aspects of prolonged duration space flight.	CbD, DAvMed, MCR	1
Understand the importance of pre-selection psychological evaluation of prospective astronauts (and potentially space tourists).	CbD, DAvMed, MCR	1
Understand the interrelationships between man, his environment and his spacecraft including the psycho-physiological factors associated with spacecraft habitability.	CbD, DAvMed, MCR	1
<b>Skills</b>		
Assess the psychological aspects of selection, dynamics of small groups and the consequences of prolonged (voluntary) confinement.	CbD, MCR	
<b>Behaviours</b>		
Demonstrate a willingness to understand the complexities of psycho-physiological factors associated with space exploration.	CbD, MCR	1

## 32. Teaching and Training

### Teaching and training

<b>To develop the ability to teach or train a variety of different audiences in a variety of different ways with appropriate assessments.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Adult learning principles relevant to medical education	CbD, MCR	
Techniques for effective appraisal and performance review	CbD, MCR	1
Identification of learning methods and effective learning objectives and outcomes		1
The role of workplace-based assessments	CbD, MCR	1
The appropriate local course of action to assist a trainee experiencing difficulty in making progress within their training programme	CbD, MCR	1
<b>Skills</b>		
Provide effective after teaching, and promote learner reflection	CbD, TO, MCR	1
Demonstrate effective lecture, presentation, small group and bed side teaching skills	CbD, TO, MCR	1,3
Provide appropriate career support, or refer trainee to an alternative effective source of career information	CbD, TO, MCR	1,3
Participate in strategies aimed at improving patient education e.g. talking at support group meetings	CbD, TO, MCR	1
Be able to lead departmental teaching programmes including journal clubs	CbD, TO, MCR	1
Recognise the trainee in difficulty and take appropriate action including where relevant referral to other services	CbD, TO, MCR	1
<b>Behaviours</b>		
Balance the needs of service delivery with education	CbD, MSF, MCR	1
Demonstrate willingness to teach trainees and other health and social workers in a variety of settings to maximise effective communication and practical skills and to improve patient care	CbD, MSF, MCR	1
Maintain honesty and objectivity during appraisal and assessment	CbD, MSF, MCR	1
Show willingness to participate in workplace-based assessments and demonstrate a clear understanding of their purpose	CbD, MSF, MCR	1
Show willingness to take up formal training as a trainer and respond to feedback obtained after teaching sessions	CbD, MSF, MCR	1,3

### 33. Information Technology, Computer Assisted Learning and Information Management

To demonstrate good use of information technology for patient care, research and for own personal development

<b>To progressively develop the ability to use effectively information technology systems.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Define how to retrieve and utilize data recorded in clinical systems.	CbD, MCR	1
Define main local and national projects and initiatives in information technology relevant to Aviation and Space Medicine.	CbD, MCR	1
Demonstrate an understanding of the range of possible uses for clinical data and research information.	CbD, MCR	1
Understand implications of the Data Protection Act for patient and subject confidentiality.	CbD, MCR	1
<b>Skills</b>		
Demonstrate competent use of database, word processing and statistics programmes.	DOPS, CbD, MCR	1
Undertake effective literature searches.	DOPS, CbD, MCR	1
Access web sites and specialist databases to undertake searches.	DOPS, CbD, MCR	1
Use commercial and local software packages.	DOPS, CbD, MCR	1
Appraise available software.	DOPS, CbD, MCR	1
Apply the principles of confidentiality and their implementation in terms of clinical and research practice in the context of information technology.	DOPS, CbD, MCR	1
Produce effective computer assisted presentations and documents.	DOPS, CbD, MCR	1
Demonstrate principles of customising information presentation to groups of varying levels of medical understanding.	DOPS, CbD, MCR	1
<b>Behaviours</b>		
Demonstrate the acquisition of new attitudes in patient consultations in order to make maximum use of information technology.	CbD, MCR	1
Adopt proactive and enquiring attitude to new technology.	CbD, MCR	1

## 34. Principles of Management and the Structure of the NHS, and International Military and Civilian Regulatory Bodies

### Structure of the NHS

<b>To understand the structure of the NHS and the management of healthcare systems in healthcare provision.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Understand the structure of the NHS.	CbD, DAvMed, MCR	1
Knowledge of the role of LETBs/postgraduate deaneries, specialist societies, the Royal Colleges and the General Medical Council.	CbD, DAvMed, MCR	1
Understand the general finance issues in the NHS, especially budgetary management.	CbD, DAvMed, MCR	1
Knowledge of the appointments procedures and the importance of equal opportunities.	CbD, DAvMed, MCR	1
Knowledge of Central Government health regulatory agencies.	CbD, DAvMed, MCR	1
<b>Skills</b>		
Demonstrate how the NHS functions and how it interacts with aviation regulatory bodies, civilian and military medical requirements.	CbD, DOPS, MCR	1,3
Demonstrate, where relevant, how military medical referrals operate within the NHS.	CbD, DOPS, MCR	1,3
<b>Behaviours</b>		
Show an awareness of equity in health care access and delivery.	CbD, MSF, PS, MCR	1
Demonstrate, where appropriate, an understanding of the importance of a health service for the aircrew and passenger population.	CbD, MSF, MCR	1,3
Show respect for others, ensuring equal opportunities.	CbD, MSF, PS, MCR	1,3,4

### Management: GMC, NHS and others

<b>To progressively develop the ability to describe the structure and function of the healthcare system and medical regulation as it applies to Aviation Medicine.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Outline the guidance given on Management and Doctors by the GMC.	CbD, mini-CEX, MCR	1
Outline the principles of:	CbD, mini-CEX, MCR	1
-Clinical coding		
-European Working Time Directive		
-National Service Frameworks		
-Health regulatory agencies (e.g. CHI, NICE, Scottish Executive)		
-NHS Structure and relationships		
-NHS finance and budgeting		
-Consultant contract and the contracting process		
-Resource allocation		
-The potential role of the Independent sector as providers of healthcare		
Describe the structure and function of the healthcare system as it	CbD, mini-CEX, MCR	1

applies to your specialty.		
Outline the principles of appointment procedures and interview techniques.	CbD, mini-CEX, MCR	1
<b>Skills</b>		
Participate in managerial meetings.	CbD, MCR	1,3
Take an active role in promoting the best use of healthcare resources.	CbD, MCR	1,3
Employ new technologies appropriately, including information technology.	CbD, MCR	1
<b>Behaviours</b>		
Recognise the importance of just allocation of healthcare resources.	CbD, MSF, PS, MCR	1
Recognise the role of physicians as active participants in healthcare systems.	CbD, MSF, MCR	1
Show willingness to improve managerial skills (e.g. management courses) and engage in management of the service.	CbD, MSF, MCR	1,3

### Structure of military and civilian aviation regulatory bodies

**To progressively develop the ability to understand military and civilian aviation regulatory bodies and promote a culture where safety is paramount.**

	<b>Assessment Methods</b>	<b>GMP</b>
<b>Knowledge</b>		
Knowledge of the structure and authority of UK, European and other international regulatory bodies including CAA, FAA, EASA, and ICAO.	CbD, DAvMed, MCR	1
Understand how the regulatory bodies interact with each other.	CbD, DAvMed, MCR	1
Knowledge of military and civilian flying regulations and how military civilian counterparts interact.	CbD, DAvMed, MCR	1
Demonstrate knowledge of the need for safety standards in aircraft operations.	CbD, DAvMed, MCR	1
<b>Skills</b>		
Demonstrate an understanding of the importance of safety regulation groups.	CbD, DOPS, MCR	1,2
Promote a culture where safety is paramount.	CbD, MCR	1,2
Knowledge of the implementation of an open and fair regulatory regime based on robust principles and processes.	CbD, MCR	1,2
Knowledge of the Hampton Principles, better regulation initiatives, consultation guidance and impact assessments.	CbD, MCR	1,2
<b>Behaviours</b>		
Understand the need to provide best practice regulation and expert advice that are independent and enable aviation to best meet the needs of its users and society in a safe and sustainable manner.	CbD, MCR	1,3,4

# RELATIONSHIPS WITH PATIENTS, COMMUNICATION AND GOVERNANCE

## 35. Ethical and Legal Issues

### Ethics and the law

<b>To know, understand and apply appropriately the principles, guidance and laws regarding medical ethics and confidentiality.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Understand the process for gaining informed consent for clinical and research activities.	CbD, mini-CEX, DAvMed, MCR	1
Understand the strategies to ensure privacy and confidentiality.	CbD, mini-CEX, DAvMed, MCR	1
Know your responsibilities relating to data protection.	CbD, mini-CEX, DAvMed, MCR	1
Understand the legal responsibilities of completing medical reports and certificates together with your responsibilities in serious criminal matters.	CbD, mini-CEX, DAvMed, MCR	1
<b>Skills</b>		
Give appropriate information in a manner patients understand and be able to gain informed consent from patients and allow disclosure when appropriate.	CbD, mini-CEX, MCR	1,2,3,4
Appropriate use of written and verbal material.	CbD, mini-CEX, MCR	1
Be able to obtain suitable evidence or know whom to consult if in doubt.	CbD, mini-CEX, MCR	1,3,4
<b>Behaviours</b>		
Consider the patient's needs as an individual.	CbD, PS, MSF, MCR	1,3,4
Respect the patient's right to confidentiality.	CbD, PS, MSF, MCR	1,3,4

### Ethics and organisations

<b>To understand the ethical principles when communicating with others about individuals.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Ethical guidelines for communications between Aviation and Space Medicine physicians, other doctors, managers, employers, military hierarchy and others.	CbD, mini-CEX, DAvMed, MCR	1,3,4
<b>Skills</b>		
Apply ethical principles when communicating with others about individuals.	CbD, mini-CEX, MCR	1,3,4
<b>Behaviours</b>		
Act in a timely and professional manner recognising your role in the organisation.	CbD, mini-CEX, MSF, MCR	1,3,4

## Medical Ethics and Confidentiality

<b>To progressively develop the ability to use and share information with the highest regard for confidentiality.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Demonstrate knowledge of the principles of medical ethics.	CbD, mini-CEX, DAvMed, MCR	1
Outline and follow the guidance given by the GMC on confidentiality.	CbD, mini-CEX, DAvMed, MCR	1
Define the provisions of the Data Protection Act and Freedom of Information Act.	CbD, mini-CEX, DAvMed, MCR	1
Define the role of the Caldicott Guardian within an institution, and outline the process of attaining Caldicott approval for audit or research.	CbD, mini-CEX, DAvMed, MCR	1
Outline the procedures for seeking a patient's consent for disclosure of identifiable information.	CbD, mini-CEX, DAvMed, MCR	1
Outline situations where patient consent, while desirable, is not required for disclosure e.g. communicable diseases, public interest.	CbD, mini-CEX, DAvMed, MCR	1
Recall the obligations for confidentiality following a patient's death.	CbD, mini-CEX, DAvMed, MCR	1
Recognise the problems posed by disclosure in the public interest, without patient's consent.	CbD, mini-CEX, DAvMed, MCR	1
Recognise the factors influencing ethical decision making: religion, moral beliefs, and cultural practices.	CbD, mini-CEX, DAvMed, MCR	1
Do not resuscitate: Define the standards of practice defined by the GMC when deciding to withhold or withdraw life-prolonging treatment.	CbD, mini-CEX, DAvMed, MCR	1
<b>Skills</b>		
Use and share information with the highest regard for confidentiality, and encourage such behaviour in other members of the team.	CbD, mini-CEX, MCR	1,3,4
Use and promote strategies to ensure confidentiality is maintained e.g. anonymisation.	CbD, mini-CEX, MCR	1,3,4
Counsel patients on the need for information distribution within members of the immediate healthcare team.	CbD, mini-CEX, MCR	1,3,4
Counsel patients, family, carers and advocates tactfully and effectively when making decisions about resuscitation status, and withholding or withdrawing treatment.	CbD, mini-CEX, MCR	1,3,4
<b>Behaviours</b>		
Encourage ethical reflection in others.	CbD, mini-CEX, MSF, MCR	1,3,4
Show willingness to seek advice of peers, legal bodies, and the GMC in the event of ethical dilemmas over disclosure and confidentiality.	CbD, mini-CEX, MSF, MCR	1,3,4
Respect patients' requests for information not to be shared, unless this puts the patients or others at risk of harm.	CbD, mini-CEX, MSF, PS, MCR	1,3,4
Show willingness to share information about their care with patients, unless they have expressed a wish not to receive such information.	CbD, mini-CEX, MSF, PS, MCR	1,3,4
Show willingness to seek the opinion of others when making decisions about resuscitation status, and withholding or withdrawing	CbD, mini-CEX, MSF, PS, MCR	1,3,4

treatment.



## 36. Maintaining Trust and Professional Behaviour

### Patient / doctor relationship

<b>To progressively develop the ability to develop appropriate relationships that facilitates solutions to aviation workers health/licensing problems.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Understand the relevance of continuity of care.	CbD, mini-CEX, MCR	1
Understand all aspects of a professional relationship and the importance of boundaries in professional relationships.	CbD, mini-CEX, MCR	1
Know how to deal with challenging behaviour.	CbD, mini-CEX, MCR	1
Know the extent of one's own limitations and know when and from whom to seek advice in matters of personal actions, competence, health and fitness.	CbD, mini-CEX, MCR	1
<b>Skills</b>		
Ensure satisfactory completion of reasonable tasks with appropriate handover including documentation.	CbD, mini-CEX, MCR	1,3
Develop appropriate relationships that facilitate solutions to aviation workers health/ licensing problems.	CbD, mini-CEX, MCR	1,2
Deal appropriately with behaviour falling outside the boundary of the agreed or ethical doctor patient relationship.	CbD, mini-CEX, MCR	1,2,3
<b>Behaviours</b>		
Recognise the importance of adopting a non-discriminatory attitude to all patients and recognise their needs as individuals.	CbD, mini-CEX, MSF, PS, MCR	1,2,3,4
Recognise the importance of acknowledging the patient's rights to accept or reject advice and the status for employment of that action.	CbD, mini-CEX, MSF, PS, MCR	1,2,3,4

### Professional behaviour

<b>To develop the behaviours that will enable the doctor to become a senior leader able to deal with complex situations and difficult behaviours and attitudes. To develop the attributes of someone who is trusted to be able to manage complex human, legal and ethical problems.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Understand the importance of personal well being in relation to physical and psychological health, and the potential impact of substance misuse.	CbD, mini-CEX, MCR	1
Understand the support facilities for doctors and other health professionals.	CbD, mini-CEX, MCR	1
Understand the role and relevance to professional and regulatory bodies.	CbD, mini-CEX, MCR	1
Understand one's responsibilities to the public.	CbD, mini-CEX, MCR	1
<b>Skills</b>		
Recognise when personal health takes priority over work pressures and be able to take the necessary time off.	CbD, mini-CEX, MCR	1,2,3,4

Recognise the situations when appropriate to involve regulatory and professional bodies.	CbD, mini-CEX, MCR	1,2,3
Reflect on own practice by participation in an appraisal and audit process	CbD, mini-CEX, MCR	1,2,3
<b>Behaviours</b>		
Be willing to admit mistakes and limitations and to consult and seek advice.	CbD, mini-CEX, MSF, MCR	1,2,3,4
Recognise personal health as an important issue.	CbD, mini-CEX, MSF, MCR	1,2,3,4
Be willing to seek advice from other relevant health professionals on personal health issues.	CbD, mini-CEX, MSF, MCR	1,2,3,4
Accept professional regulation.	CbD, mini-CEX, MSF, MCR	1,2,3,4

## 37. Communication

### Communicating with patient and other aviation workers

<b>Recognise and accept the responsibilities and role of the doctor in relation to other healthcare and aviation professionals. Communicate succinctly and effectively with other professionals as appropriate.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Understand how to structure the interview to identify the patient's concerns, expectations, understanding and acceptance of outcome.	CbD, mini-CEX, MCR	1
Understand the importance of informed consent.	CbD, mini-CEX, MCR	1
Understand the need to share information openly with others, but within ethical, professional and legal constraints of confidentiality.	CbD, mini-CEX, MCR	1
Understand the local complaints procedures and systems of independent review.	CbD, mini-CEX, MCR	1
Organisation and role of other health and safety professionals and disciplines.	CbD, mini-CEX, MCR	1
<b>Skills</b>		
Listen to patients and other stakeholders.	CbD, mini-CEX, MCR	1,3,4
Use open questions followed by appropriate closed questions.	CbD, mini-CEX, MCR	1,3,4
Be able to communicate both orally and in writing to patients and others in a manner that they understand, avoiding jargon.	CbD, mini-CEX, MCR	1,3,4
Give clear information and feedback to patients and share information.	CbD, mini-CEX, MCR	1,3,4
Provide appropriate information on impact of prognosis and aeromedical disposition.	CbD, mini-CEX, MCR	1,3,4
Manage dissatisfied patients/aviation workers anticipate potential problems.	CbD, mini-CEX, MCR	1,3,4
Prepare written reports on a range of topics for a range of groups.	CbD, mini-CEX, MCR	1,3,4
Be able to effectively participate in committees and to act as a chairperson.	CbD, mini-CEX, MCR	1,3,4
Make clear oral presentations to a range of audiences using audiovisual equipment.	CbD, mini-CEX, MCR	1,3,4
<b>Behaviours</b>		
Act with empathy, honesty fairness and sensitivity.	CbD, mini-CEX, MSF, PS, MCR	1,3,4
Act in a timely and professional manner recognising your role in the organisation.	CbD, mini-CEX, MSF, MCR	1,3,4
Be impartial when providing advice to managers/employers.	CbD, mini-CEX, TMSF, MCR	1,3,4

## 38. Clinical and Research Governance

The organisational framework for Clinical Governance at local and national levels. Understanding of the benefits a patient might reasonably expect from Clinical Governance.

### Creating an environment where mistakes and mismanagement of patients can be openly discussed and learned from.

<b>To progressively develop an awareness of and the implementation of clinical governance policies. To recognise the desirability of monitoring performance, learning from mistakes and adopting no blame culture in order to ensure high standards of care and optimise safety.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Define the important aspects of Clinical Governance: medical and clinical audit, research and development, evidenced based practice, clinical effectiveness, and clinical risk systems.	CbD, mini-CEX, MCR	1,2,4
Define the procedures and the effective action when things go wrong in own practice or that of others.	CbD, mini-CEX, MCR	1,2,4
Understand complaints procedures and quality assurance schemes in Aviation and Space Medicine practice	CbD, mini-CEX, MCR	1,2,4
<b>Skills</b>		
Be an active participant in clinical governance.	CbD, mini-CEX, MCR	1,2
Be active in research and development.	CbD, mini-CEX, MCR	1,2
Critically appraise medical and scientific data research.	CbD, mini-CEX, MCR	1,2
Practice evidence based medicine.	CbD, mini-CEX, MCR	1,2
Aim for clinical and research effectiveness (best practice) at all times.	CbD, mini-CEX, MCR	1,2
Educate self, colleagues, other professionals and students.	CbD, mini-CEX, MCR	1,2,3
Be able to handle and deal with complaints in a focused and constructive manner.	CbD, mini-CEX, MCR	1,2
Learn from complaints.	CbD, mini-CEX, MCR	1,2,4
Develop and institute clinical and research guidelines.	CbD, mini-CEX, MCR	1,2,4
Be aware of advantages and disadvantages of guidelines.	CbD, mini-CEX, MCR	1,2
Report and investigate critical clinical and research incidents.	CbD, mini-CEX, MCR	1,2,3
Regular review of adverse events and modify practice accordingly.	CbD, mini-CEX, MCR	1,2,4
Take appropriate action if you suspect you or a colleague may not be fit to practice.	CbD, mini-CEX, MCR	1,2,4
<b>Behaviours</b>		
Make the care of your patient your first concern.	CbD, mini-CEX, PS, MSF, MCR	1,2,4
Respect patient's privacy, dignity and confidentiality.	CbD, mini-CEX, PS, MSF, MCR	1,2,4
Be prepared to learn from mistakes, errors and complaints.	CbD, mini-CEX, MSF, MCR	1,2,4
Recognise the importance of team work.	CbD, mini-CEX, MSF, MCR	1,2,4

Share best practice with others.	CbD, mini-CEX, MSF, MCR	1,2,4
Willingness to cultivate a questioning approach to current practice of Aviation and Space Medicine and be motivated to make improvements.	CbD, mini-CEX, MSF, MCR	1,2,4

## Evidence

<b>To progressively develop the ability to make the optimal use of current best evidence in making decisions about the care of patients.</b>		
	<b>Assessment Methods</b>	<b>GMP</b>
<b>Knowledge</b>		
Know & understand the principles of evidence based medicine.	CbD, mini-CEX, MCR	1
<b>Skills</b>		
Able to critically appraise evidence.	CbD, mini-CEX, MCR	1,2
Ability to be competent in the use of databases, libraries and the internet.	CbD, mini-CEX, MCR	1
Able to discuss the relevance of evidence with individual patients.	CbD, mini-CEX, MCR	1,3,4
<b>Behaviours</b>		
Display a keenness to use evidence in the support of patient care and own decisions therein.	CbD, mini-CEX, PS, MSF, MCR	1,2,4

## Audit

<b>To progressively develop the ability to perform an audit and to apply the findings appropriately.</b>		
	<b>Assessment Methods</b>	<b>GMP</b>
<b>Knowledge</b>		
Know & understand the steps involved in an audit cycle, data sources and data confidentiality.	AA, MCR	1
Recall the role of audit (developing patient care, risk management etc).	AA, MCR	1
<b>Skills</b>		
Be able to undertake medical and clinical audit and to design, implement and complete audit cycles.	AA, MCR	1
Be actively involved in audit cycles.	AA, MCR	1
<b>Behaviours</b>		
Recognise the need for audit in clinical practice.	AA, MCR	1,2
Consider the relevance of audit to benefit patient care, Aviation and Space Medicine research and clinical governance.	AA, MCR	1,2

## Guidelines

<b>To progressively develop the ability to construct evidence based guidelines in relation to medical practise.</b>		
	<b>Assessment Methods</b>	<b>GMP</b>
<b>Knowledge</b>		
Outline the advantages and disadvantages of guidelines.	CbD, mini-CEX, MCR	1,2,4
Describe the principles of critical appraisal.	CbD, mini-CEX, MCR	1,2,4

Outline the advantages and disadvantages of different study methodologies (randomised control trials, case controlled cohort etc).	CbD, mini-CEX, MCR	1,2,4
<b>Skills</b>		
Contribute to the construction, review and updating of local (and national) guidelines of good practice using the principles of evidence based medicine.	CbD, mini-CEX, MCR	1,2
Appraise retrieved evidence to address a clinical question.	CbD, mini-CEX, MCR	1,2
Apply conclusions from critical appraisal into clinical care.	CbD, mini-CEX, MCR	1,2
<b>Behaviours</b>		
Keep up to date with national reviews and guidelines of practice (e.g. NICE15 and SIGN16).	CbD, mini-CEX, MCR	1,2,4
Aim for best clinical practice (clinical effectiveness) at all times.	CbD, mini-CEX, MCR	1,2,4
Recognise the occasional need to practise outside clinical guidelines.	CbD, mini-CEX, MCR	1,2,4
Encourage discussion amongst colleagues on evidence-based practice	CbD, mini-CEX, MSF, MCR	1,2,4

## Learning

**To progressively develop the ability to identify gaps in knowledge and plan actions to fill them with a view to translate knowledge and new learning into practice.**

Translate knowledge and new learning into practice	Assessment Methods	GMP
Outline the principles of adult learning theory.	CbD, mini-CEX, MCR	1
Define the principles of Continuing Professional Development.	CbD, mini-CEX, MCR	1
<b>Skills</b>		
Identify gaps in knowledge and plan actions to fill them.	CbD, mini-CEX, MCR	1
Translate knowledge and new learning into practice	CbD, mini-CEX, MCR	1
Maintain a portfolio of Continuing Professional Development (CPD)	CbD, mini-CEX, MCR	1
Model and promote CPD within the multi-disciplinary team.	CbD, mini-CEX, MCR	1
<b>Behaviours</b>		
Strive to enhance professional competence with active involvement in CPD activities	CbD, mini-CEX, MCR	1,2
Recognise the moral and professional obligation to maintain competence and be accountable.	CbD, mini-CEX, MCR	1,2,3,4
Reflect on all aspects of practice.	CbD, mini-CEX, MCR	1,2,3,4

## 39. Health Promotion and Public Health

### Health promotion and public health

<b>To progressively develop the ability to work with individuals and organisations to reduce levels of ill health and improve the general health of the target population.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Outline current UK screening programmes.	CbD, mini-CEX, MCR	1
Cite the determinants of health, including psychological, biological, social, cultural and economic factors.	CbD, mini-CEX, MCR	1
Know the main risks to pilot licence revocation on medical grounds that may be influenced by health education and promotion.	CbD, mini-CEX, MCR	1
Demonstrate knowledge of the main risks of transmission of communicable disease from air travel and how to minimise these risks.	CbD, mini-CEX, MCR	1
<b>Skills</b>		
Utilise opportunities for health promotion and disease prevention in patients.	CbD, mini-CEX, MCR	1,3
Counsel patients on the benefits and risks of screening.	CbD, mini-CEX, MCR	1,3
Recognise the interaction between mental and physical health.	CbD, mini-CEX, MCR	1,3
Utilise opportunities for health promotion and disease prevention in pilots and other licence holders.	CbD, mini-CEX, MCR	1,3
<b>Behaviours</b>		
Encourage appropriate screening to facilitate early intervention	CbD, mini-CEX, MCR	1,3
Encourage effective team working in health promotion	CbD, mini-CEX, MSF, MCR	1,3
Show willingness to remain well briefed in local or national outbreaks	CbD, mini-CEX, MCR	1,3

## 40. Legal Framework for Practice

### Legal framework for practice

<b>To understand the legal framework within which healthcare is provided to ensure that personal clinical practice is always provided in line with this legal framework.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Build on the knowledge gained during the Foundation Programme in the following medico-legal areas: -Child protection relevant to adolescent and adult practice -Mental health legislation: the powers to detain a patient and giving emergency treatment against patient's will under common law -Death certification and role of coroner / procurator fiscal -Advance directives and living wills -Withdrawing and withholding treatment -Decisions regarding resuscitation status of patients -Surrogate decision making such as Power of Attorney -Organ donation and retention and awareness of local procedures -Communicable disease notification -Medical risk and driving. Conditions to be reported by patients to the DVLA and responsibilities of doctors if patients do not. -Data Protection and Freedom of Information Acts -Provision of continuing care and community nursing care by local authorities, including Section 47 National Assistance act	CbD, mini-CEX, MCR	1
Outline sources of medico-legal information.	CbD, mini-CEX, MCR	1
Outline the process of discipline in the event of medical malpractice.	CbD, mini-CEX, MCR	1
Outline the procedure to be followed when abuse is suspected.	CbD, mini-CEX, MCR	1
<b>Skills</b>		
Prepare a medico-legal statement for submission to the Coroner's Court and other legal proceedings	CbD, mini-CEX, MCR	1
Incorporate legal principles into day to day practice.	CbD, mini-CEX, MCR	1,2
Practise and promote accurate documentation within clinical practice.	CbD, mini-CEX, MCR	1,2
<b>Behaviours</b>		
Show willingness to seek advice from the Healthcare Trust, legal bodies (including defence unions), and the GMC on medico-legal matters.	CbD, mini-CEX, MCR	1,2,3,4
Promote reflection on legal issues by members of the team.	CbD, mini-CEX, MSF, MCR	1,2,3,4



## 41. Managing Long Term Conditions & Promoting Patient Self-Care

### Managing long term conditions & promoting patient self-care

<b>To work with patients and use their expertise to manage their condition collaboratively and in partnership, with mutual benefit.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Describes the natural history of diseases and illnesses that run a chronic course	CbD, mini-CEX, MCR	1
Defines the role of rehabilitation services and the multi-disciplinary team to facilitate long-term care	CbD, mini-CEX, MCR	1
Outlines the concept of quality of life and how this can be measured, whilst understanding the limitations of such measures for individual patients	CbD, MCR	1
Outlines the concept of patient self-care and the role of the expert patient	CbD, mini-CEX, MCR	1
Knows, understands and is able to compare and contrast the medical and social models of disability	CbD, MCR	1
Knows about the key provisions of disability discrimination legislation	CbD, MCR	1
Understands the relationship between local health, educational and social service provision including the voluntary sector	CbD, MCR	1
<b>Skills</b>		
Develops and agrees on a management plan with the patient (and carers), ensuring comprehension to maximise self-care within care pathways where relevant	CbD, mini-CEX, MCR	1, 3
Develops and sustains supportive relationships with patients with whom care will be prolonged and potentially life long	CbD, mini-CEX, MCR	1, 4
Provides relevant evidence-based information and, where appropriate, effective patient education, with support of the multi-disciplinary team	CbD, mini-CEX, MCR	1, 3, 4
Promotes and encourages involvement of patients in appropriate support networks, both to receive support and to give support to others	CbD, PS, MCR	1, 3
Encourages and supports patients in accessing appropriate information	CbD, PS, MCR	1, 3
<b>Behaviours</b>		
Shows willingness and support for patient in his/her own advocacy, within the constraints of available resources and taking into account the best interests of the wider community	CbD, mini-CEX, MCR	3, 4
Recognises the potential impact of long term conditions on the patient, family and friends	CbD, mini-CEX, PS, MCR	1,4
Provides relevant tools and devices when possible	CbD, mini-CEX, MCR	1
Ensures equipment and devices relevant to the patient's care are discussed	CbD, PS, MCR	1
Puts patients in touch with the relevant agency including the voluntary sector from where they can procure the items as appropriate	CbD, mini-CEX, PS, MCR	1, 3

Provides the relevant tools and devices when possible	CbD, mini-CEX, MCR	1, 2
Shows willingness to facilitate access to the appropriate training and skills in order to develop the patient's confidence and competence to self care, and adapt appropriately as those members change over time	CbD, mini-CEX, PS, MCR	1, 3, 4
Shows willingness to maintain a close working relationship with other members of the multi-disciplinary team, primary and community care	CbD, mini-CEX, MSF, MCR	3
Shows a willingness to engage with expert patients and representatives of charities or networks that focus on diseases and recognises their role in supporting patients and their families/carers	CbD, mini-CEX, MSF, MCR	3,4
Recognises and respects the role of family, friends and carers in the management of the patient with a long term condition	CbD, mini-CEX, PS, MCR	1, 3
Puts patients in touch with the relevant agency, including the voluntary sector from where they can procure the items as appropriate	CbD, mini-CEX, MSF, MCR	3,4

## 42. Breaking Bad News

### Breaking bad news

**To recognise the fundamental importance of breaking bad news. To develop strategies for skilled delivery of bad news according to the needs of the individual.**

<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Recall and build upon the competencies defined in the Foundation Curriculum: -Interview structure -Normal bereavement process -Understand and respect cultural differences -Select appropriate setting -Encourage questioning and ensure comprehension -Avoid undue optimism or pessimism -Act with empathy, honesty and sensitivity and also when licence is lost on medical grounds.	CbD, mini-CEX, MCR	1,3
<b>Skills</b>		
Demonstrate to others good practice in breaking bad news.	CbD, mini-CEX, MCR	1,3,4
Demonstrate an ability to discuss the loss of licence on medical grounds.	CbD, mini-CEX, MCR	1,3,4
<b>Behaviours</b>		
Take leadership in breaking bad news.	CbD, mini-CEX, MSF, PS, MCR	1,3,4
Respect the different ways people react to bad news.	CbD, mini-CEX, MSF, PS, MCR	1,3,4

## 43. Complaints and Medical Error

### Complaints and medical error

<b>To progressively develop the ability to contribute to processes whereby complaints are reviewed and learned from.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Recall and build upon the competencies defined in the Foundation Programme: -Awareness of local complaints procedure -Factors likely to lead to complaints (poor communication, dishonesty etc) -Adopt behaviour likely to prevent complaints -Deal with dissatisfied patients or relatives -Recognise when something has gone wrong and identify appropriate staff to communicate this with -Act with honesty and sensitivity in a non-confrontational manner	CbD, mini-CEX, MCR	1
Outline the principles of an effective apology.	CbD, mini-CEX, MCR	1
Define the local complaints procedure.	CbD, mini-CEX, MCR	1
Identify sources of help and support when a complaint is made about yourself or a colleague	CbD, mini-CEX, MCR	1
<b>Skills</b>		
Contribute to processes whereby complaints are reviewed and learned from.	CbD, mini-CEX, MCR	1,3
Explain comprehensibly to the patient the events leading up to a medical error.	CbD, mini-CEX, MCR	1,3,4
Deliver an appropriate apology.	CbD, mini-CEX, MCR	1,3,4
Distinguish between system and individual errors.	CbD, mini-CEX, MCR	1,3,4
<b>Behaviours</b>		
Take leadership over complaint issues.	CbD, mini-CEX, MSF, PS, MCR	1,3,4
Recognise the impact of complaints and medical error on staff, patients, and the National Health Service.	CbD, mini-CEX, MSF, PS, MCR	1,3,4
Contribute to a fair and transparent culture around complaints and errors.	CbD, mini-CEX, MSF, PS, MCR	1,3,4
Recognise the rights of patients, family members and carers to make a complaint.	CbD, mini-CEX, MSF, PS, MCR	1,3,4

# MEDICAL LEADERSHIP

## 44. Demonstrating Personal Qualities

### Developing self-awareness

<b>To progressively develop the ability to practice critical self-awareness, including ability to discuss and address strengths and weaknesses.</b>		
	<b>Assessment Methods</b>	<b>GMP</b>
<b>Knowledge</b>		
Demonstrate knowledge of :		
Ways in which individual behaviours impact on others; personality types, group dynamics, learning styles, leadership styles.	CbD, mini-CEX, MCR	1
Methods of obtaining feedback from others.	CbD, mini-CEX, MCR	1
<b>Skills</b>		
Demonstrate the ability to:		
Maintain and routinely practice critical self-awareness, including ability to discuss strengths and weaknesses with supervisor, recognising external influences and changing behaviour accordingly	CbD, mini-CEX, MCR	1,3,4
Show awareness of and sensitivity to the way in which cultural and religious beliefs affect approaches and decisions, and to respond respectfully	CbD, mini-CEX, MCR	1,3,4
<b>Behaviours</b>		
Demonstrate:		
Adopting a patient-focused approach to decisions that acknowledges the right, values and strengths of patients and the public	CbD, mini-CEX, MSF, PS, MCR	1,3,4
Recognising and showing respect for diversity and differences in others	CbD, mini-CEX, MSF, PS, MCR	1,3,4

### Managing yourself

<b>To progressively develop the ability to manage professional and personal roles and recognise the manifestations of stress.</b>		
	<b>Assessment Methods</b>	<b>GMP</b>
<b>Knowledge</b>		
Demonstrate knowledge of:		
Tools and techniques for managing stress.	CbD, mini-CEX, MCR	1
The role and responsibility of occupational health and other support networks,	CbD, mini-CEX, MCR	1
The limitations of self professional competence.	CbD, mini-CEX, MCR	1
<b>Skills</b>		
Demonstrate the ability to:		
Recognise the manifestations of stress on self and others and know where and when to look for support.	CbD, mini-CEX, MCR	1,2,3
Balance personal and professional roles and responsibilities.	CbD, mini-CEX, MCR	1,2,3
Prioritise tasks, having realistic expectations of what can be completed by self and others.	CbD, mini-CEX, MCR	1,2,3

<b>Behaviours</b>		
Demonstrate: Being conscientious, able to manage time and delegate.	CbD, mini-CEX, MSF, PS, MCR	1,2,3,4
Recognising personal health as an important issue.	CbD, mini-CEX, MSF, PS, MCR	1,2,3,4

## Continuing personal development

<b>To progressively develop the ability to manage continuing professional education and development.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Demonstrate knowledge of:	CbD, mini-CEX, MCR	1,2,
• Local processes for dealing with and learning from clinical errors.		
• The importance of best practice, transparency and consistency	CbD, mini-CEX, MCR	1,2
<b>Skills</b>		
Demonstrate the ability to:	CbD, mini-CEX, MCR	1,2
• Use a reflective approach to practice with an ability to learn from previous experience.		
• Use assessment, appraisal, complaints and other feedback to discuss and develop an understanding of own development needs.	CbD, mini-CEX, MCR	1,2
<b>Behaviours</b>		
Demonstrate:	CbD, mini-CEX, MSF, PS, MCR	1,2,3,4
• Being prepared to accept responsibility.		
• Commitment to continuing professional development which involves seeking training and self-development opportunities, learning from colleagues and accepting constructive criticism.	CbD, mini-CEX, MSF, PS, MCR	1,2,3,4

## Acting with integrity

<b>To progressively develop the ability to recognise, analyse and know how to deal with unprofessional behaviours in practice.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Demonstrate knowledge of:	CbD, mini-CEX, MCR	1
• The professional, legal and ethical codes of the GMC, e.g. Fitness to Practice and any other codes pertaining to the specialty.		
• Prejudice and preferences within self, others, society and cultures.	CbD, mini-CEX, MCR	1
<b>Skills</b>		
• Recognise, analyse and know how to deal with unprofessional behaviours in clinical practice, taking into account local and national regulations.	CbD, mini-CEX, MCR	1,2
• Create open and non-discriminatory professional working relationships with colleagues.	CbD, mini-CEX, MCR	1,2,3
Awareness of the need to prevent bullying and harassment.	CbD, mini-CEX, MCR	1,2,3,4
<b>Behaviours</b>		
• Acceptance of professional regulation.	CbD, mini-CEX MSF, PS, MCR	1

• Promotion of professional attitudes and values.	CbD, mini-CEX MSF, PS, MCR	1
• Probity and the willingness to be truthful and admit errors.	CbD, mini-CEX MSF, PS, MCR	1

## 45. Working with Others

### Developing networks

<b>To progressively develop the ability to bring together different professionals, disciplines and other agencies to provide high quality outputs.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Demonstrate knowledge of:	CbD, mini-CEX, MCR	1,3,4
• The role of team dynamics in the way a group, team or department functions.		
• Team structures and the structure, roles and responsibilities of the multidisciplinary teams within the broader health context relevant to the specialty, including other agencies.	CbD, mini-CEX, MCR	1,3,4
<b>Skills</b>		
Demonstrate the ability to:	CbD, mini-CEX, MCR	1,3,4
• Take on differing and complementary roles within the different communities of practice within which they work.		
• Support bringing together different professionals, disciplines, and other agencies, to provide high quality healthcare.	CbD, mini-CEX, MCR	1,3,4
<b>Behaviours</b>		
Demonstrate:	CbD, mini-CEX, MSF, PS, MCR	1,3,4
• Effective interaction with professionals in other disciplines and agencies.		
• Respecting the skills and contributions of colleagues.	CbD, mini-CEX, MSF, PS, MCR	1,3,4

### Building and maintaining relationships

<b>To progressively develop the ability to develop effective working relationships with colleagues and other staff.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Demonstrate knowledge of:	CbD, mini-CEX, MCR	1,3
• Specific techniques and methods that facilitate effective and empathic communication.		
<b>Skills</b>		
Demonstrate the ability to:	CbD, mini-CEX, MCR	1,3,4
• Develop effective working relationships with colleagues and other staff through good communication skills, building rapport and		

articulating own view.		
• Communicate effectively in the resolution of conflicts, providing feedback, and identifying and rectifying team dysfunction	CbD, mini-CEX, MCR	1,3,4
<b>Behaviours</b>		
Demonstrate:	CbD, mini-CEX, MSF, PS, MCR	1,3,4
• Recognising good advice and continuously promoting value-based non-prejudicial practice		
• Using authority appropriately and assertively; willing to follow when necessary.	CbD, mini-CEX, MSF, PS, MCR	1,3,4

## Encouraging contribution

<b>To develop the leadership skills necessary to lead teams so that they are more effective and able to deliver better safer care.</b>		
	<b>Assessment Methods</b>	<b>GMP</b>
<b>Knowledge</b>		
Demonstrate knowledge of:	CbD, mini-CEX, MCR	1,3
• Facilitation and conflict resolution methods.		
<b>Skills</b>		
Demonstrate the ability to:	CbD, mini-CEX, MCR	1,3,4
• Facilitate, chair, and contribute to meetings.		
• Encourage staff to develop and exercise their own leadership skills.	CbD, mini-CEX, MCR	1,3,4
<b>Behaviours</b>		
Demonstrate:	CbD, mini-CEX, MSF, PS, MCR	1,3,4
• Using authority sensitively and assertively to resolve conflict and disagreement.		
• Taking full part in multi-disciplinary meetings.	CbD, mini-CEX, MSF, PS, MCR	1,3,4

## Working within teams

<b>To develop the ability to work well in a variety of different teams.</b>		
	<b>Assessment Methods</b>	<b>GMP</b>
<b>Knowledge</b>		
Demonstrate knowledge of:	CbD, mini-CEX, MCR	1,3,4
• A wide range of leadership styles and approaches and the applicability to different situations and people.		
<b>Skills</b>		
Demonstrate the ability to:	CbD, mini-CEX, MCR	1,3,4
• Enable individuals, groups and agencies to implement plans and decisions.		
• Identify and prioritise tasks and responsibilities including to delegate and supervise safely.	CbD, mini-CEX, MCR	1,3,4
<b>Behaviours</b>		
Demonstrate:	CbD, mini-CEX, MSF, PS, MCR	1,3,4
• Showing recognition of a team approach and willingness to consult and work as part of a team.		



• Respecting colleagues, including non-medical professionals.	CbD, mini-CEX, MSF, PS, MCR	1,3,4
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## 46. Managing Services

### Principles of management

<b>To progressively develop the ability to manage change, people and resources.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Understand the principle of management and good leadership skills.	CbD, mini-CEX, MCR	1
Knowledge of leadership qualities frameworks: setting direction, personal qualities and delivering service.	CbD, mini-CEX, MCR	1
Understand how to lead, direct and prepare for meetings and seminars.	CbD, mini-CEX, MCR	1,3
<b>Skills</b>		
Develop skills in managing change and managing people.	CbD, mini-CEX, MCR	1,2,3,4
Develop leadership skills to play a leading role in developing Aviation and Space Medicine practice.	CbD, mini-CEX, MCR	1,2,3,4
Develop interviewing techniques.	CbD, mini-CEX, MCR	1,2,3,4
Be able to build a business plan.	CbD, mini-CEX, MCR	1,3,4
Allocate resources and manage financial budgets.	CbD, mini-CEX, MCR	1,2,3,4
<b>Behaviours</b>		
Demonstrate a willingness to assume managerial responsibilities.	CbD, mini-CEX, MSF, MCR	1,2,3,4

### Management in organisations

<b>To progressively develop the ability to demonstrate personal responsibility for aspects of management within a department of Aviation and Space Medicine or equivalent in a regulatory organisation.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Understand industrial relations and the role of employers, unions and others.	CbD, mini-CEX, MCR	1,3
Know the basic financial arrangements for business/organisation including budgets.	CbD, mini-CEX, MCR	1,3
Understand the management structures in different aviation (military or civilian) organisations.	CbD, mini-CEX, MCR	1,3
Understand the principles of audit in a business and professional healthcare/regulatory context.	CbD, mini-CEX, MCR	1,3
Outline the principle of staff management, team-working and appraisal of performance.	CbD, mini-CEX, MCR	1,3
<b>Skills</b>		
Be able to demonstrate personal responsibility for aspects of management within a department of Aviation and Space Medicine or equivalent in a regulatory organisation.	CbD, mini-CEX, MCR	1,3

Be able to strategically plan and set objectives for delivering an Aviation and Space Medicine requirement.	CbD, mini-CEX, MCR	1,3
Evaluate the effectiveness and quality of an Aviation and Space Medicine capability.	CbD, mini-CEX, MCR	1,3
Be able to work with managers, supervisors, employees and employees' representatives.	CbD, mini-CEX, MCR	1,3
Participate in audit relevant to the needs of the organisation.	CbD, mini-CEX, MCR	1,3
<b>Behaviours</b>		
Be impartial when providing advice to managers/employers.	CbD, mini-CEX, MSF, MCR	1,3

## Planning

### To progressively develop the ability to apply business management and planning principles to an organisation.

	Assessment Methods	GMP
<b>Knowledge</b>		
Demonstrate knowledge of:	CbD, mini-CEX, MCR	1
• The structure, financing, and operation of the NHS and its constituent organisations		
• Ethical and equality aspects relating to management and leadership e.g. approaches to use of resources/rationing; approaches to involving the public and patients in decision-making.	CbD, mini-CEX, MCR	1
• Business management principles: priority setting and basic understanding of how to produce a business plan.	CbD, mini-CEX, MCR	1
• The requirements of running a department, unit or practice relevant to the specialty.	CbD, mini-CEX, MCR	1
<b>Skills</b>		
Demonstrate the ability to:	CbD, mini-CEX, MCR	1,2,3
• Develop protocols and guidelines, and implementation of these		
• Analyse feedback and comments and integrate them into plans for the service.	CbD, mini-CEX, MCR	1,2,3
<b>Behaviours</b>		
Demonstrate:	CbD, mini-CEX, MSF, MCR	1,2,3
• An awareness of equity in healthcare access and delivery.		

## Managing resources

### To progressively develop the ability to manage time and resources effectively.

	Assessment Methods	GMP
<b>Knowledge</b>		
Demonstrate knowledge of:	CbD, mini-CEX, MCR	1
• Efficient use of clinical resources in order to provide care.		
• Commissioning, funding and contracting arrangements relevant to the specialty.	CbD, mini-CEX, MCR	1
• How financial pressures experienced by the specialty department and organisation are managed.	CbD, mini-CEX, MCR	1
<b>Skills</b>		

Demonstrate the ability to:	CbD, mini-CEX, MCR	1,2,3
• Use clinical audit with the purpose of highlighting resources required.		
• Manage time and resources effectively in terms of delivering services to patients.	CbD, mini-CEX, MCR	1,2,3
<b>Behaviours</b>		
Demonstrate:	CbD, mini-CEX, MSF, MCR	1,2,3
• Commitment to the proper use of public money. Showing a commitment to taking action when resources are not used efficiently or effectively.		
• Awareness that in addition to patient specific clinical records, clinical staffs also have responsibilities for other records (e.g. research).	CbD, mini-CEX, MSF, MCR	1,2,3

## Managing people

**To progressively develop the ability to recruit, select and manage staff.**

	Assessment Methods	GMP
<b>Knowledge</b>		
Demonstrate knowledge of:	CbD, mini-CEX, MCR	1
• Relevant legislation (e.g. Equality and Diversity, Health and Safety, Employment Law) and local Human Resource policies.		
• The duties, rights and responsibilities of an employer, and of a co-worker (e.g. looking after occupational safety of fellow staff).	CbD, mini-CEX, MCR	1
• Individual performance review purpose, techniques and processes, including difference between appraisal, assessment and revalidation.	CbD, mini-CEX, MCR	1
<b>Skills</b>		
Demonstrate the ability to:	CbD, mini-CEX, MCR	1,2,3,4
• Prepare rotas, delegate, organise and lead teams.		
• Contribute to the recruitment and selection of staff.	CbD, mini-CEX, MCR	1,2,3,4
• Contribute to staff development and training, including mentoring, supervision and appraisal.	CbD, mini-CEX, MCR	1,2,3,4
<b>Behaviours</b>		
Demonstrate:	CbD, mini-CEX, MSF, MCR	1,2,3,4
• Willingness to supervise the work of less experienced colleagues.		
• Commitment to good communication whilst also inspiring confidence and trust.	CbD, mini-CEX, MSF, MCR	1,2,3,4

## Managing performance

**To progressively develop the ability to adhere to clinical guidelines and protocols, morbidity and mortality reporting systems, and complaint management systems.**

	Assessment Methods	GMP
<b>Knowledge</b>		
Demonstrate knowledge of	CbD, mini-CEX, MCR	1
• Organisational performance management techniques and processes.		
• How complaints arise and how they are managed.	CbD, mini-CEX, MCR	1,2,3

<b>Skills</b>		
Demonstrate the ability to	CbD, mini-CEX, MCR	1,2,3
<ul style="list-style-type: none"> <li>• Use and adhere to clinical guidelines and protocols, morbidity and mortality reporting systems, and complaints management systems.</li> <li>• Improve services following evaluation/performance management.</li> </ul>	CbD, mini-CEX, MCR	1,2,3
<b>Behaviours</b>		
Demonstrate:	CbD, mini-CEX, MSF, MCR	1,2,3
<ul style="list-style-type: none"> <li>• Responding constructively to the outcome of reviews, assessments or appraisals of performance</li> <li>• Understanding the needs and priorities of non-clinical staff.</li> </ul>	CbD, mini-CEX, MSF, MCR	1,2,3

## Managing Teams

<b>To progressively develop the ability to understand the roles and responsibilities of team members and other relevant specialists.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Understand the roles and responsibilities of team members and other relevant specialists.	CbD, MCR	1
Understand how a team works effectively.	CbD, MCR	1
Know one's own professional status and specialist competence.	CbD, MCR	1
<b>Skills</b>		
Respect skills and contribution of colleagues to be conscientious and work constructively.	CbD, MCR	1,2,3
Demonstrate the ability for: setting of objectives, lateral thinking, planning, motivating, organising, example setting, and influencing and negotiation skills.	CbD, MCR	1,2,3
Delegate, show leadership and supervise safely	CbD, MCR	1,2,3
Recognise when input from another specialty is required for individual patients.	CbD, MCR	1,2,3
Ability to prioritise activity and review progress.	CbD, MCR	1,2,3
Ability to be an effective team player.	CbD, MCR	1,2,3
<b>Behaviours</b>		
Recognise own limitations.	CbD, MSF, MCR	1,2,3
Demonstrate enthusiasm; integrity; courage of convictions, imagination, determination, energy; and professional credibility.	CbD, MSF, MCR	1,2,3
Respect colleagues, including non-medical professionals, and recognise good advice.		

## 47. Improving Services

### Ensuring Patient, Aviation Worker and Passenger Safety

<b>To progressively develop the ability to assess and analyse situations, services and facilities in order to minimise risk.</b>		
	<b>Assessment Methods</b>	<b>GMP</b>
<b>Knowledge</b>		
Demonstrate knowledge of:	CbD, mini-CEX, MCR	1,2
<ul style="list-style-type: none"> <li>• Risk management issues pertinent to Aviation and Space Medicine practice, understand potential sources of risk and risk management tools, techniques and protocols.</li> </ul>		
<ul style="list-style-type: none"> <li>• How healthcare governance influences patient care, research and educational activities at a local, regional and national level.</li> </ul>	CbD, mini-CEX, MCR	1,2
<b>Skills</b>		
Demonstrate the ability to:	CbD, mini-CEX, MCR	1,2
<ul style="list-style-type: none"> <li>• Report clinical incidents.</li> </ul>		
<ul style="list-style-type: none"> <li>• Assess and analyse situations, services and facilities in order to minimise risk to patients, aviation workers and the public.</li> </ul>	CbD, mini-CEX, MCR	1,2
<ul style="list-style-type: none"> <li>• Monitor the quality of equipment and safety of environment relevant to the specialty.</li> </ul>	CbD, mini-CEX, MCR	1,2
<b>Behaviours</b>		
Demonstrate:	CbD, mini-CEX, MCR	1,2
<ul style="list-style-type: none"> <li>• Actively seeking advice/assistance whenever concerned about patient and aviation worker safety.</li> </ul>		
<ul style="list-style-type: none"> <li>• Willingness to take responsibility for clinical governance activities, risk management and audit in order to improve the quality of the service.</li> </ul>	CbD, mini-CEX, MCR	1,2

### Critically Evaluating

<b>To progressively develop the ability to improve the quality of outputs.</b>		
	<b>Assessment Methods</b>	<b>GMP</b>
<b>Knowledge</b>		
Demonstrate knowledge of:	CbD, PS, AA, MCR	1,2,3
<ul style="list-style-type: none"> <li>• Quality improvement methodologies including a range of methods of obtaining feedback from patients, aviation workers, the public, and staff.</li> </ul>		
<ul style="list-style-type: none"> <li>• The principles and processes of evaluation, audit, research and development, clinical guidelines and standard setting in improving quality.</li> </ul>	CbD, PS, AA, MCR	1,2,3
<b>Skills</b>		
Demonstrate ability to:	CbD, PS, AA, MCR	1,2,3
<ul style="list-style-type: none"> <li>• Undertake an audit project.</li> </ul>		
<ul style="list-style-type: none"> <li>• Contribute to meetings which cover audit; critical incident reporting, patient outcomes.</li> </ul>	CbD, PS, AA, MCR	1,2,3
<b>Behaviours</b>		

Demonstrate:	CbD, MSF, PS, AA, MCR	1,2,3
• Listening to and reflecting on the views of patients and aviation workers, dealing with complaints in a sensitive and cooperative manner.		
• Acting as an advocate for the service.	CbD, MSF, PS, AA, MCR	1,2,3

## Encouraging Improvement and Innovation

**To progressively develop the ability to use a variety of methodologies for developing creative solutions to improving services.**

	Assessment Methods	GMP
<b>Knowledge</b>		
Demonstrate knowledge of:	CbD, MCR	1
• A variety of methodologies for developing creative solutions to improving services.		
<b>Skills</b>		
Demonstrate the ability to:	CbD, MCR	1
• Question existing practice in order to improve services.		
• Apply creative thinking approaches (or methodologies or techniques) in order to propose solutions to service issues.	CbD, MCR	1
<b>Behaviours</b>		
Demonstrate:	CbD, MSF, PS, MCR	1,2,4
• Being open minded to new ideas.		
• A proactive approach to new technologies and treatments.	CbD, MSF, PS, MCR	1,2,4
• Supporting colleagues to voice ideas.	CbD, MSF, PS, MCR	1,2,4

## Facilitating Transformation

**To progressively develop the ability to respond to and facilitate change.**

	Assessment Methods	GMP
<b>Knowledge</b>		
Demonstrate knowledge of	CbD, MCR	1
• The implications of change on systems and people.		
• Project management methodology.	CbD, MCR	1
<b>Skills</b>		
Demonstrate the ability to:	CbD, TO, MCR	1,2,4
• Provide medical expertise in situations beyond those involving direct patient or aviation worker care		
• Show effective presentation skills (written and verbal).	CbD, TO, MCR	1,2,4
<b>Behaviours</b>		
Demonstrate:	CbD, MSF, PS, MCR	1,2,4
• Being positive about improvement and change.		
• Striving for continuing improvement in delivering patient and aviation worker care services.	CbD, MSF, PS, MCR	1,2,4

## 48. Setting Direction

### Identifying the contexts for change

<b>To progressively develop the ability to identify and respond to trends, future options and strategies relevant to aviation and space medicine.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Demonstrate knowledge of:	CbD, MCR	1
<ul style="list-style-type: none"> <li>The responsibilities of the various Executive Board members and Clinical Directors or leaders</li> </ul>		
<ul style="list-style-type: none"> <li>The function and responsibilities of national bodies such as DH, HCC, NICE, NPSA, NCAS; Royal Colleges and Faculties, specialty specific bodies, representative bodies; regulatory bodies; educational and training organisations.</li> </ul>	CbD, MCR	1
<b>Skills</b>		
Demonstrate the ability to:	CbD, MCR	1,3,4
<ul style="list-style-type: none"> <li>Discuss the local, national and UK health priorities and how they impact on the delivery of health care relevant to the specialty.</li> </ul>		
<ul style="list-style-type: none"> <li>Identify trends, future options and strategy relevant to the specialty and delivering patient services.</li> </ul>	CbD, MCR	1,3,4
<b>Behaviours</b>		
Demonstrate:	CbD, MSF, PS, MCR	1,3,4
<ul style="list-style-type: none"> <li>Compliance with national guidelines that influence healthcare provision.</li> </ul>		
<ul style="list-style-type: none"> <li>Willingness to articulate strategic ideas and use effective influencing skills.</li> </ul>	CbD, MSF, PS, MCR	1,3,4

### Applying knowledge and evidence

<b>To progressively develop the ability to use a broad range of scientific and policy publications relating to delivering aviation medicine services.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Demonstrate knowledge of:	CbD, MCR	1
<ul style="list-style-type: none"> <li>Patient outcome reporting systems within the specialty, and the organisation and how these relate to national programmes and aviation regulatory bodies.</li> </ul>		
<ul style="list-style-type: none"> <li>Research methods and how to evaluate scientific publications including the use and limitations of different methodologies for collecting data.</li> </ul>	CbD, MCR	1
<b>Skills</b>		
Demonstrate the ability to:	CbD, MCR	1
<ul style="list-style-type: none"> <li>Compare and benchmark healthcare services.</li> </ul>		
<ul style="list-style-type: none"> <li>Use a broad range of scientific and policy publications relating to delivering healthcare services.</li> </ul>	CbD, MCR	1
<b>Behaviours</b>		
Demonstrate:	CbD, MSF, MCR	1,3,4
<ul style="list-style-type: none"> <li>The ability to understand issues and potential solutions before</li> </ul>		

acting.

## Making decisions

<b>To progressively develop the ability to work decisively and collaboratively to deliver services.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Demonstrate knowledge of:	CbD, MCR	1,3,4
• How decisions are made by individuals, teams and the organisation.		
• Effective communication strategies within organisations.	CbD, MCR	1,3,4
<b>Skills</b>		
Demonstrate the ability to:	CbD, DOPS, MCR	1,3,4
• Prepare for meetings – reading agendas, understanding minutes, action points and background research on agenda items		
• Work collegiately and collaboratively with a wide range of people outside the immediate clinical or aviation setting.	CbD, DOPS, MCR	1,3,4
<b>Behaviours</b>		
Demonstrate:	CbD, MSF, MCR	1,3,4
• Appreciating the importance of involving the public and communities in developing health services.		
• Willingness to participate in decision making processes beyond the immediate clinical care setting.	CbD, MSF, MCR	1,3,4

## Evaluating impact

<b>To progressively develop the ability to evaluate outcomes and re-assess the solutions through research, audit and quality assurance activities.</b>		
<b>Knowledge</b>	<b>Assessment Methods</b>	<b>GMP</b>
Demonstrate knowledge of:	CbD, AA, MCR	1
• Impact mapping of service change.		
• Barriers to change.	CbD, AA, MCR	1
• Qualitative methods to gather the experience of patients and carers.	CbD, AA, MCR	1
<b>Skills</b>		
• Demonstrate the ability to	CbD, DOPS, AA, MCR	1,2,3,4
Evaluate outcomes and re-assess the solutions through research, audit and quality assurance activities.		
• Ability to understand the wider impact of implementing change in healthcare provision and the potential for opportunity costs.	CbD, DOPS, AA, MCR	1,2,3,4
<b>Behaviours</b>		
Demonstrate:	CbD, MSF, AA, MCR	1,2,3,4
• Commitment to implementing proven improvements in clinical practice and services.		
• Obtaining the evidence base before declaring effectiveness of changes.	CbD, MSF, AA, MCR	1,2,3,4
• Attitudes and behaviours that assist dissemination of good practice.	CbD, MSF, AA, MCR	1,2,3,4



## **4 Learning and Teaching**

### **4.1 The training programme**

The organisation and delivery of postgraduate training is the statutory responsibility of the General Medical Council (GMC) which devolves responsibility for the local organisation and delivery of training to the LETBs/deaneries. Training posts in Aviation and Space Medicine will be in various settings, which are invariably outside the NHS. A lead or 'host' LETB will be responsible for the organisation and delivery of specialty training in Aviation and Space Medicine. All training in Aviation and Space Medicine should be conducted in institutions with appropriate standards of clinical governance and which meet the relevant Health and Safety standards for clinical and work areas. Training placements must also comply with the European Working Time Directive for trainee doctors. Training posts must provide the necessary clinical exposure but also evidence that the required supervision and assessments can be achieved.

### **4.2 Higher Specialty Training Course Structure**

#### **ST3**

ST3 of the HST will concentrate on the acquisition of skills in basic science and Aviation and Space Medicine, with an emphasis on human physiology and clinical aviation medicine. In order to achieve these curriculum competencies it is recommended that trainees attend a diploma course in Aviation and Space Medicine. Assessment of this knowledge base will be by successful submission to the examinations for the Diploma in Aviation Medicine of the Faculty of Occupational Medicine (DAvMed) at the Royal College of Physicians. The higher specialty training programme is flexible and so the Diploma in Aviation Medicine may be studied for and its exam taken in ST4 or 5 depending on the individual's tailored training programme and requirements of his/her employing organisation. The examination is a summative assessment which must be passed by end of ST5 in order to be eligible for the award of a CCT. The diploma is blueprinted to the syllabus (please see section 3.3),

Training will continue in the practice of Aviation and Space Medicine and will encourage the development of the essential research skills necessary to devise, conduct and report original research. The trainee should start to be able to demonstrate adequate knowledge of scientific methodology and statistical or epidemiological research techniques. These skills may be gained through the trainees' work in their employing organisation or they could undertake an MSc in Aviation and Space Medicine, Aeromedical Research or Human and Applied Physiology in order to gain these competencies. In addition, the ability to evaluate adequately the research efforts of others will be gained. The training will also address the acquisition of other skills, such as the teaching and management abilities essential to a practising Consultant.

#### **ST4-6**

These years will have a number of principle elements to the training; clinical aviation and space medicine, role specific competencies, research, teaching and training, and managerial skills.

Clinical Aviation and Space Medicine is to include the medical care of aircrew, (including other aviation workers) and of air passengers. To achieve the appropriate delivery of medical care to both passengers and aircrew the trainee is required to acquire detailed knowledge of the medical and physiological consequences of flight and to understand the specific requirements of each group. Maintenance of clinical skills must be demonstrated by regular and continuing clinical contact with aircrew or passengers under assessment for fitness for flight. The trainee will be expected to maintain a portfolio of cases managed, and clinical assessments conducted involving aircrew (including cabin crew), other aviation workers and passengers. The portfolio of cases should contain a full report of the clinical presentation, its investigation and management, as well as supporting evidence drawn from the medical literature. A review of the portfolio will form an element of their Annual Review of Competence Progression (ARCP).

The imparting of knowledge of Aviation and Space Medicine to groups of doctors, aircrew and passengers is a crucial element of the role of Aviation and Space Medicine specialists. Therefore, all specialists are required to develop expertise in this area. A formal course of training in teaching techniques should be undertaken and satisfactory performance in this role demonstrated. The trainee will be required to maintain a record of teaching and training duties undertaken and their performance in this activity will be assessed by Teaching Observations in the organisation in which they work.

Managerial skills will be developed through wider professional training. This may include the supervision and assessment of junior medical and non-medical staff, the demonstration of financial awareness and accountability when working within a constrained budget and the ability to communicate by written and oral means to the contribution of aeromedical considerations to aviation project management. A period of formal staff/management training would be advantageous to the trainee.

The sequence of training should ensure appropriate progression in experience and responsibility. The training to be provided at each training site is defined to ensure that, during the programme, the entire curriculum is covered and also that unnecessary duplication and educationally unrewarding experiences are avoided. However, the sequence of training should ideally be flexible enough to allow the trainee to develop a special interest.

### **4.3 Teaching and learning methods**

The curriculum will be delivered through a variety of learning experiences. Trainees will learn from practice, clinical skills appropriate to their level of training and to their attachment within the department.

Trainees will achieve the competencies described in the curriculum through a variety of learning methods. There will be a balance of different modes of learning from formal teaching programmes to experiential learning 'on the job'. The proportion of time allocated to different learning methods may vary depending on the nature of the attachment within a rotation.

This section identifies the types of situations in which a trainee will learn.

**Learning with peers** - There are many opportunities for trainees to learn with their peers. Local postgraduate teaching opportunities allow trainees of varied levels of experience to come together for small group sessions. Examination preparation encourages the formation of self-help groups and learning sets.

**Work-based experiential learning** - The content of work-based experiential learning is decided by the local faculty for education but includes active participation in:

- Medical clinics including specialty clinics. After initial induction, trainees will review patients in clinics, under direct supervision. The degree of responsibility taken by the trainee will increase as competency increases. As experience and clinical competence increase trainees will assess 'new' and 'review' patients and present their findings to their clinical supervisor.
- Patient centred learning. Every patient seen provides a learning opportunity, which will be enhanced by following the patient through the course of their medical condition management and aeromedical disposition. Patients seen should provide the basis for critical reading and reflection of clinical problems.
- Multi-disciplinary team meetings. There are many situations where clinical problems are discussed with clinicians in other disciplines. These provide excellent opportunities for observation of clinical reasoning.

Trainees have supervised responsibility for the care of patients. This includes review of clinical conditions, note keeping, and the initial aeromedical management of the patient with referral to and liaison with other clinical colleagues as necessary. The degree of responsibility taken by the trainee will increase as competency increases. There should be appropriate levels of clinical supervision throughout training with increasing clinical independence and responsibility as learning outcomes are achieved (see Section 5: Feedback and Supervision).

**Formal postgraduate teaching** – The content of these sessions are determined by the local faculty of medical education and will be based on the curriculum. There are many opportunities throughout the year for formal teaching. Many of these are organised by internationally recognised organisations.

Suggested activities include:

- One to one teaching with the Aviation and Space Medicine Physicians.
- Case presentations.
- Research and audit projects.
- Journal clubs and local medical meetings.
- Lectures and small group teaching.
- Aviation and Space Medicine skills demonstrations and teaching.
- Critical appraisal and evidence based medicine.
- Other specialty meetings such as CAA Medical Advisory Panel Meeting.
- Attendance at regional, national and international meetings such as the Aerospace Medical Association Annual Scientific Meeting, International Congress in Aviation and Space Medicine, and Royal Aeronautical Society Aerospace Medicine Group Seminars.

Attendance at the educational activity must be properly documented and a record of satisfactory attendance is regarded as an essential prerequisite for progression through training. The trainee should understand that reflecting on practice is a crucial part of learning and both the trainee and the supervisor should explore the thinking that underlies good practice. Acquiring and demonstrating abilities in self-directed learning is an essential part of training to be a professional and the trainee should develop these skills to include reading textbooks, journals and review articles, web based learning and research in the process of writing presentations for teaching. The trainees must develop and gain excellent computer skills. The participation in journal clubs fosters critical thinking and an approach to the evaluation of the medical literature, which is essential to professional practice. Aviation and Space Medicine

specialists need themselves to be excellent teachers and will develop their teaching skills by presenting to colleagues and to other personnel on Aviation and Space Medicine courses. Hence, all trainees should attend formal training in presentational and teaching skills.

**Opportunities for concentrated practice in skills and procedures** - There are a number of skills and practical procedures specific to the practice of Aviation and Space Medicine, for example altitude chamber assessments, human centrifuge assessments, aircrew equipment integration, motion sickness desensitisation, accident investigation, noise and vibration assessments, interpretation of ECGs and EEGs for the aviation environment, cardiologic imaging, optometric assessments and other skills and practical procedures in which it will be appropriate for trainees to receive training. It is important that these skills are acquired at the pace appropriate to the individual trainee. Acquisition of these skills will require some initial theoretical training, followed by supervised practice with increasing independence. The training programme should afford the trainee the opportunity to maintain and further enhance these skills once acquired.

**Independent self-directed learning** - Trainees will use this time in a variety of ways depending upon their stage of learning. Suggested activities include:

- Reading, including web-based material
- Maintenance of personal portfolio (self-assessment, reflective learning, personal development plan)
- Audit and research projects
- Reading journals
- Achieving personal learning goals beyond the essential, core curriculum

**Formal study courses** - Time to be made available for formal courses is encouraged, subject to local conditions of service. Examples include management courses and communication courses.

#### 4.4 Research

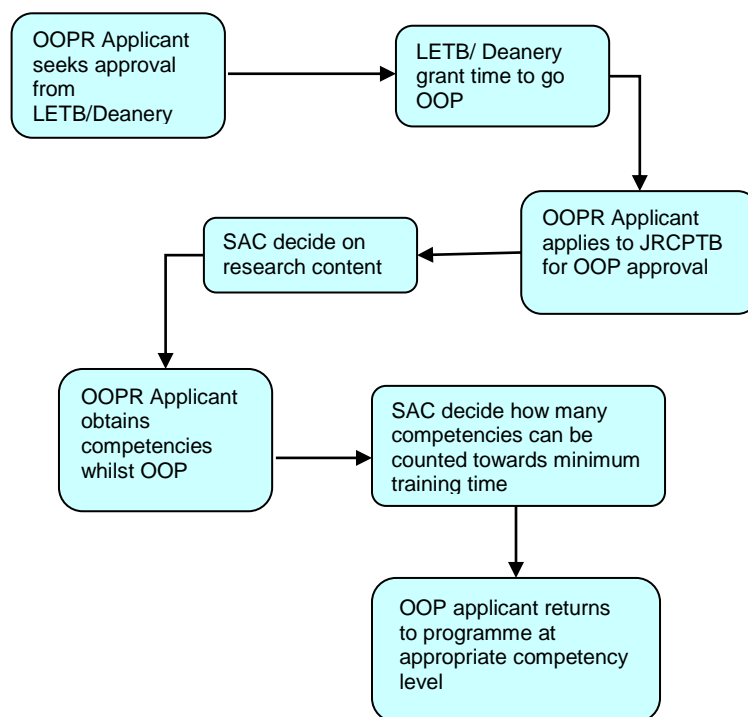
A principal activity of a significant proportion of specialists in Aviation and Space Medicine is the conduct of aeromedical research or the informed assessment of research conducted by others. To be effective in either role the trainee must have achieved a high standard in his or her own research activities. This will be achieved by the trainee conducting research projects assessed by the Educational Supervisor, at ARCP, by its publication in the open literature or with the award of a higher research degree. In the case of work carried out in a field restricted from publication by security considerations, papers given a restricted circulation will be available to the Educational Supervisor and the ARCP for inspection.

Research is integral to the Aviation and Space Medicine Curriculum, but trainees may elect to conduct out of programme research (OOPR) or take part in an out of programme experience (OOPE). In which case applications to research bodies, the LETB/deanery (via an OOPR form) and the JRCPTB (via a Research Application Form) are necessary steps, which are the responsibility of the trainee. The established procedures for the approval of OOPR and OOPE need to be observed in order for the trainee to receive credit from the activity towards their training. The JRCPTB Research Application Form can be accessed via the JRCPTB website. It requires an estimate of the competencies that will be achieved and, once completed, it should be returned to JRCPTB together with a job description and an up to date CV. The JRCPTB will submit applications to the relevant SACs for review of the research content including an indicative assessment of the amount of clinical credit

(competence acquisition) which might be achieved. This is likely to be influenced by the nature of the research (e.g. entirely laboratory-based or strong clinical commitment), as well as duration (e.g. 12 month Masters, 2-year MD, 3-Year PhD). On approval by the SAC, the JRCPTB will advise the trainee and the LETB/deanery of the decision. The LETB/deanery will make an application to the PMETB for approval of the out of programme research. All applications for out of programme research must be prospectively approved.

Upon completion of the research period the competencies achieved will be agreed by the OOP Supervisor, Educational Supervisor and communicated to the SAC, accessing the facilities available on the JRCPTB ePortfolio. The competencies achieved will determine the trainee's position on return to programme; for example if an ST3 trainee obtains all ST4 competencies then 12 months will be recognised towards the minimum training time and the trainee will return to the programme at ST5. This would be corroborated by the subsequent ARCP.

This process is shown in the diagram below:



Funding will need to be identified for the duration of the research period. Trainees need not count research experience or its clinical component towards a CCT programme but must decide whether or not they wish it to be counted on application to the LETB/deanery and the JRCPTB.

A maximum period of 3 years out of programme is allowed and the SACs will recognise up to 12 months towards the minimum training times.

The trainee will have to demonstrate at the ARCP that the research competencies have been achieved. If the trainee has decided to embark on formal study for a higher research degree the award of the research degree will demonstrate that the research competencies have been met.

Within these years there is the capability to run the various aspects of the training in continuum or to divide the programme into elective blocks. This will be determined on

an individual basis and will have to take into consideration the project requirements of the trainee's research work. There is the possibility that the electives may involve some overseas study so the trainee is able to gain a wide experience of military and civilian medical boards and Aviation and Space Medicine research organisations.

### **Overseas Training**

Trainees are encouraged to spend a period of at least 3 months working in Aviation and Space Medicine outside the UK. This may be in support of UK air operations overseas or with aviation medical authorities or agencies of another nation. Local supervision may be delegated to a suitable expert in the region in which the trainee is working, although the overall supervision of the trainee's work and progress would remain the responsibility of the designated UK Educational Supervisor. Trainees may apply for up to six months out of programme training (OOPT) overseas. Requests will be considered on an individual basis to ensure the training opportunities and level of supervision required are clear and trainees should refer to the guidance on the JRCPTB website ([www.jrcptb.org.uk](http://www.jrcptb.org.uk)).

## **5 Assessment**

### **5.1 The assessment system**

The purpose of the assessment system is to:

- enhance learning by providing formative assessment, enabling trainees to receive immediate feedback, measure their own performance and identify areas for development;
- drive learning and enhance the training process by making it clear what is required of trainees and motivating them to ensure they receive suitable training and experience;
- provide robust, summative evidence that trainees are meeting the curriculum standards during the training programme;
- ensure trainees are acquiring competencies within the domains of Good Medical Practice;
- assess trainees' actual performance in the workplace;
- ensure that trainees possess the essential underlying knowledge required for their specialty;
- inform the Annual Review of Competence Progression (ARCP), identifying any requirements for targeted or additional training where necessary and facilitating decisions regarding progression through the training programme;
- identify trainees who should be advised to consider changes of career direction.

The integrated assessment system comprises of workplace-based assessments and knowledge based assessments. Individual assessment methods are described in more detail below.

Workplace-based assessments will take place throughout the training programme to allow trainees to continually gather evidence of learning and to provide trainees with formative feedback. They are not individually summative, unless indicated, but overall outcomes from a number of such assessments provide evidence for summative decision making. The number and range of these will ensure a reliable assessment of the training relevant to their stage of training and achieve coverage of the curriculum.

The number of assessments required in each training year is detailed in the ARCP decision aid (see below and the JRCPTB website [www.jrcptb.org.uk](http://www.jrcptb.org.uk)).

## 5.2 Assessment Blueprint

In the syllabus (3.3) the “Assessment Methods” shown are those that are appropriate as **possible** methods that could be used to assess each competency. It is not expected that all competencies will be assessed and that where they are assessed not every method will be used.

## 5.3 Assessment methods

The following assessment methods are used in the integrated assessment system:

### Examinations and certificates

- The Diploma in Aviation Medicine (DAvMed)

The Diploma in Aviation Medicine is awarded by the Faculty of Occupational Medicine of the Royal College of Physicians (London) following success in the faculty examination, which, from 2018, will be held in March/April each year. The examination is a summative assessment which must be passed in order to meet the requirements for a CCT in Aviation and Space Medicine. Doctors in training will be expected to pass the DAvMed by the end of ST5. Please see the ARCP decision aid for further details. Information about the current diploma, including guidance for candidates, is available on the Faculty of Occupational Medicine website [www.facoccmmed.ac.uk](http://www.facoccmmed.ac.uk).

Doctors in training may undertake the DAvMed course as a method of achieving the outcomes listed in the syllabus which are assessed by the DAvMed examination. The diploma course will normally be funded by employers.

### Research

- MSc MD, or PhD Thesis (Aviation and Space Medicine Research)

### Workplace-based assessments WPBAs

- mini-Clinical Evaluation Exercise (mini-CEX)
- Case-Based Discussion (CbD)
- Direct Observation of Procedural Skills (DOPS)
- Multi-Source Feedback (MSF)
- Patient Survey (PS)
- Audit Assessment (AA)
- Teaching Observation (TO)

These methods are described briefly below. Workplace-based assessments will take place throughout the training programme to allow trainees to continually gather evidence of learning and to provide trainees with formative feedback. They are not individually summative, unless indicated, but overall outcomes from a number of such assessments provide evidence for summative decision making. The number and range of these will ensure a reliable assessment of the training relevant to their stage of training and achieve coverage of the curriculum.

More information about these methods including guidance for trainees and assessors is available in the ePortfolio and on the [JRCPTB website](#). Workplace-based assessments should be recorded in the trainee’s ePortfolio. The workplace-based assessment methods include feedback opportunities as an integral part of the assessment process; this is explained in the guidance notes provided for the techniques.

**Mini-Clinical Evaluation Exercise (mini-CEX)**

This tool is used for supervised learning events (SLEs) and evaluates a clinical encounter with a patient to provide an indication of competence in skills essential for good clinical care such as history taking, examination and clinical reasoning. The trainee receives immediate feedback to aid learning. The mini-CEX can be used at any time and in any setting when there is a trainee and patient interaction and an assessor is available.

**Case based Discussion (CbD)**

This SLE assesses the performance of a trainee in their management of a patient to provide an indication of competence in areas such as clinical reasoning, decision-making and application of medical knowledge in relation to patient care. It also serves as a method to document conversations about, and presentations of, cases by trainees. The CbD should include discussion about a written record (such as written case notes, out-patient letter, and discharge summary). A typical encounter might be when presenting newly referred patients in the out-patient department.

**Direct Observation of Procedural Skills (DOPS)**

A DOPS is an assessment tool designed to assess the performance of a trainee in undertaking a practical procedure, against a structured checklist. The trainee receives immediate feedback to identify strengths and areas for development. Formative DOPS should be undertaken before doing a summative DOPS and can be undertaken as many times as the trainee and their supervisor feel is necessary.

**Multisource feedback (MSF)**

This tool is a method of assessing generic skills such as communication, leadership, team working, reliability etc, across the domains of Good Medical Practice. This provides objective systematic collection and feedback of performance data on a trainee, derived from a number of colleagues. 'Raters' are individuals with whom the trainee works, and includes doctors, administration staff, and other allied professionals. The trainee will not see the individual responses by raters; feedback is given to the trainee by the Educational Supervisor.

**Patient Survey (PS)**

Patient Survey address issues, including behaviour of the doctor and effectiveness of the consultation, which are important to patients. It is intended to assess the trainee's performance in areas such as interpersonal skills, communication skills and professionalism by concentrating solely on their performance during one consultation.

**Audit Assessment Tool (AA)**

The Audit Assessment Tool is designed to assess a trainee's competence in completing an audit. The Audit Assessment can be based on review of audit documentation OR on a presentation of the audit at a meeting. If possible the trainee should be assessed on the same audit by more than one assessor.

**Teaching Observation (TO)**

The Teaching Observation form is designed to provide structured, formative feedback to trainees on their competence at teaching. The Teaching Observation can be based on any instance of formalised teaching by the trainee who has been observed by the assessor. The process should be trainee-led (identifying appropriate teaching sessions and assessors).



#### **5.4 Decisions on progress (ARCP)**

The Annual Review of Competence Progression (ARCP) is the formal method by which a trainee's progression through her/his training programme is monitored and recorded. The ARCP process is described in A Reference Guide for Postgraduate Specialty Training in the UK (the "Gold Guide" – available from [www.mmc.nhs.uk](http://www.mmc.nhs.uk)). The lead/host LETB will be responsible for organising and conducting ARCPs. The evidence to be reviewed by ARCP panels should be collected in the trainee's ePortfolio.

The ARCP Decision Aid is included in section 5.5, giving details of the evidence required of trainees for submission to the ARCP panels.

## 5.5 ARCP Decision Aid

<b>Aviation and Space Medicine Training ARCP Decision Aid – standards for recognising satisfactory progress</b>				
	<b>1<sup>st</sup> Year (ST3)</b>	<b>2<sup>nd</sup> Year (ST4)</b>	<b>3<sup>rd</sup> Year (ST5)</b>	<b>4<sup>th</sup> Year (ST6)</b>
<b>Good Clinical Practice</b>	Demonstrate history, examination, investigation and record keeping skills. Demonstrate ability to clinically assess fitness to fly based on national and international regulation. Demonstrate principles of assessment & management of hazards and risk to health in the aviation workplace.			
<b>Role Specific Competencies</b>	Demonstrate core Aviation and Space Medicine knowledge up to the standard expected for the DAvMed (may be ST4 or 5 depending when DAvMed is sat) and instigation of safe aeromedical disposal for some simple aeromedical presentations. Some experience as evidenced by mini-CEX, CbD, DOPS, TO.	Demonstrate core Aviation and Space Medicine knowledge in a minimum of half of the areas and instigation of safe aeromedical disposal for some aeromedical presentations. Competent in a minimum of half as evidenced by mini-CEX, CbD, DOPS, TO.	Demonstrate core Aviation and Space Medicine knowledge in most areas and instigation of safe aeromedical disposal for most aeromedical presentations' including some complex cases. Competent in a minimum of three quarters as evidenced by mini-CEX, CbD, DOPS, TO.	Demonstrate adequate creation of management and investigation pathways, and instigation of safe aeromedical disposal of all aeromedical presentations' including the vast majority of complex cases that would be encountered as a practicing consultant. Competent in all competencies as evidenced by mini-CEX, CbD, DOPS, TO.
<b>Management and Leadership</b>	Demonstrate acquisition of leadership skills in supervising the work of more junior medical colleagues and non-medical staff.	Demonstrate implementation of evidence based medicine whenever possible. Demonstrate good practice in team-working and contributing to multi-disciplinary teams.	Able to supervise and lead a complete aeromedical assessment of patients and aviation workers. Able to supervise more junior trainees and to liaise with other specialties. Awareness and implementation of national and international regulatory guidelines.	Clinical governance policies and involvement in a management role within operational, regulatory and research directorates, as an observer or trainee representative.
<b>Research</b>	Prepare and analyse research projects under guidance from senior	Submit and have accepted a doctoral/masters research project, or initiate and	Maintain and achieve satisfactory progress with research projects.	Publication of research projects in peer reviewed literature or successful

	colleagues	commence research projects for publication in the open literature.	Satisfactory doctoral/masters thesis progress and/or body of research work by individual academic institution's assessment procedures.	completion of PhD, MD, or MSc.
<b>Examination</b>	DAvMed attempted/passed	DAvMed attempted/passed	DAvMed passed	
<b>Portfolio</b>	Documentary evidence of: clinical cases, work based assessments, examinations, research, Aviation and Space Medicine referrals/flight issues.			
<b>Minimum number of work place assessments per year</b>	Supervised learning events (SLEs): 6 x CbDs and 6 x mini-CEX 2 x TO; 6 x DOPS. Audit Assessment where relevant, 1 satisfactory MSF, 1 Patient Survey, 2 MCRs. To be spread throughout the year			
<b>ILS</b>	Valid	Valid	Valid	Valid
<b>Events giving concern</b>	The following events occurring at any time may trigger review of trainee's progress and possible remedial training: issues of professional behaviour; poor performance in work-place based assessments; poor MSF performance; issues arising from supervisor report; issues of patient safety.			

## 5.6 Penultimate Year Assessment (PYA)

The penultimate ARCP prior to the anticipated CCT date will include an external assessor from outside the training programme. JRCPTB and the LETB/deanery will coordinate the appointment of this assessor. This is known as “PYA”. Whilst the ARCP will be a review of evidence, the PYA will include a face to face component.

## 5.7 Complaints and Appeals

The Faculty of Occupational Medicine has complaints procedures and appeals regulations documented on its website which apply to the Diploma in Aviation Medicine.

All workplace-based assessment methods incorporate direct feedback from the assessor to the trainee and the opportunity to discuss the outcome. If a trainee has a complaint about the outcome from a specific assessment this is their first opportunity to raise it.

Appeals against decisions concerning in-year assessments will be handled at LETB/deanery level and LETB/deanery are responsible for setting up and reviewing suitable processes. If a formal complaint about assessment is to be pursued this should be referred in the first instance to the chair of the Specialty Training Committee who is accountable to the regional LETB/deanery. Continuing concerns should be referred to the Associate Dean.

# 6 Supervision and feedback

## 6.1 Supervision

All elements of work in training posts must be supervised with the level of supervision varying depending on the experience of the trainee and the clinical exposure and case mix undertaken. Clinical cases and referral supervision must routinely include the opportunity to personally discuss all cases if required. As training progresses the trainee should have the opportunity for increasing autonomy, consistent with safe and effective care for the patient.

Trainees will have a named educational supervisor and clinical supervisor responsible for overseeing their education. These roles may be combined into a single role of educational supervisor in small centres.

Educational and clinical supervisors will normally be consultants in Aviation and Space Medicine, occupational physicians working full time in regulatory or airline Aviation and Space Medicine. However, during some research elements direct supervision may be given by a suitably qualified specialist in the relevant area of study.

The responsibilities of supervisors have been defined by GMC in the document “Operational Guide for the GMC Quality Framework”. These definitions have been agreed with the National Association of Clinical Tutors, the Academy of Medical Royal Colleges and the Gold Guide team at MMC, and are reproduced below:

### ***Educational Supervisor***

*A trainer who is selected and appropriately trained to be responsible for the overall supervision and management of a specified trainee’s educational progress during a training placement or series of placements. The Educational Supervisor is responsible for the trainee’s Educational Agreement.*

### **Clinical Supervisor**

*A trainer who is selected and appropriately trained to be responsible for overseeing a specified trainee's clinical work and providing constructive feedback during a training placement.*

The Educational Supervisor, when meeting with the trainee, should discuss issues of clinical governance, risk management and any report of any untoward clinical incidents involving the trainee. The Educational Supervisor should be part of the clinical specialty team. Thus if the clinical directorate (clinical director) have any concerns about the performance of the trainee, or there were issues of doctor or patient safety, these would be discussed with the Educational Supervisor. These processes, which are integral to trainee development, must not detract from the statutory duty of the trainees' employing organisation to deliver effective clinical governance through its management systems.

Opportunities for feedback to trainees about their performance will arise through the use of the workplace-based assessments, regular appraisal meetings with supervisors, other meetings and discussions with supervisors and colleagues, and feedback from ARCP.

## **6.2 Appraisal**

A formal process of appraisals and reviews underpins training. This process ensures adequate supervision during training, provides continuity between posts and different supervisors and is one of the main ways of providing feedback to trainees. All appraisals should be recorded in the ePortfolio

### **Induction Appraisal**

The trainee and Educational Supervisor should have an appraisal meeting at the beginning of each post to review the trainee's progress so far, agree learning objectives for the post ahead and identify the learning opportunities presented by the post. Reviewing progress through the curriculum will help trainees to compile an effective Personal Development Plan (PDP) of objectives for the upcoming post. This PDP should be agreed during the Induction Appraisal. The trainee and supervisor should also both sign the educational agreement in the e-portfolio at this time, recording their commitment to the training process.

### **Mid-point Review**

This meeting is not mandatory, but is encouraged particularly if either the trainee or Educational Supervisor has training concerns. At this meeting trainees should review their PDP with their supervisor using evidence from the e-portfolio. Workplace-based assessments and progress through the curriculum can be reviewed to ensure trainees are proceeding satisfactorily, and attendance at educational events should also be reviewed. The PDP can be amended at this review.

### **End of Attachment Appraisal**

Trainees should review the PDP and curriculum progress with their Educational Supervisor using evidence from the e-portfolio. Specific concerns may be highlighted from this appraisal. The end of attachment appraisal form should record the areas where further work is required to overcome any shortcomings. Further evidence of competence in certain areas may be needed, such as planned workplace-based assessments, and this should be recorded. If there are significant concerns following the end of attachment appraisal then the programme director should be informed

## **7 Managing curriculum implementation**

### **7.1 Intended use of curriculum by trainers and trainees**

This curriculum and ePortfolio are web-based documents which are available from the Joint Royal Colleges of Physicians Training Board (JRCPTB) website [www.jrcptb.org.uk](http://www.jrcptb.org.uk).

The Educational Supervisors and trainers can access the up-to-date curriculum from the JRCPTB website and will be expected to use this as the basis of their discussion with trainees. Both trainers and trainees are expected to have a good knowledge of the curriculum and should use it as a guide for their training programme. Curriculum coverage is ensured through regular meetings of the Educational Supervisor and the trainee. In a specialty like Aviation and Space Medicine it is recognised that experience in certain areas of the curriculum may need to be covered by a period of attachment in another training centre. Areas of the curriculum covered are signed off by the Educational Supervisor and the trainee as they are completed. Every trainee must reach the educational objectives in all areas of the curriculum.

Each trainee will engage with the curriculum by maintaining a portfolio. The trainee will use the curriculum to develop learning objectives and reflect on learning experiences.

### **7.2 Recording progress**

On enrolling with JRCPTB trainees will be given access to the ePortfolio for Aviation and Space Medicine. The ePortfolio allows evidence to be built up to inform decisions on a trainee's progress and provides tools to support trainees' education and development.

The trainee's main responsibilities are to ensure the ePortfolio is kept up to date, arrange assessments and ensure they are recorded, prepare drafts of appraisal forms, maintain their personal development plan, record their reflections on learning and record their progress through the curriculum.

The supervisor's main responsibilities are to use ePortfolio evidence such as outcomes of assessments, reflections and personal development plans to inform appraisal meetings. They are also expected to update the trainee's record of progress through the curriculum, write end-of-attachment appraisals and supervisor's reports.

## **8 Curriculum review and updating**

The curriculum should be regarded as a fluid, living document and the SAC will ensure to respond swiftly to new clinical and service developments. In addition, the curriculum will need to meet the new GMC curriculum and assessment standards and incorporate the Generic Professional Capabilities. The curriculum will evolve into an outcomes based curriculum mapped to the new standards. This will be informed by curriculum evaluation and monitoring. The SAC will have available:

- The trainees' survey, which will include questions pertaining to their specialty (GMC to provide)
- Specialty-specific questionnaires ( if applicable)
- Reports from other sources such as Educational Supervisors, programme directors, specialty deans, service providers and patients.

- Trainee representation on the LETB/Deanery STC and the SAC of the JRCPTB
- Informal trainee feedback during appraisal.

Evaluation will address:

- The relevance of the learning outcomes to clinical practice
- The balance of work-based and off-the-job learning
- Quality of training in individual posts
- Feasibility and appropriateness of on-the-job assessments in the course of training programmes
- Availability and quality of research opportunities
- Current training affecting the service
- Equality and diversity monitoring

Evaluation will be the responsibility of the JRCPTB and GMC. These bodies must approve any significant changes to the curriculum.

Interaction with the Aviation and Space Medicine trainees' employing/training organisations will be particularly important to understand the performance of specialists within these organisations and feedback will be required as to the continuing needs for that specialty as defined by the curriculum. It is likely that these organisations will have views as to the balance between generalist and specialist skills, the development of generic competencies and, looking to the future, the need for additional specialist competencies and curricula. In establishing specialty issues which could have implications for training, the SAC will produce a summary report to discuss with these organisations and ensure that conclusions are reflected in curriculum reviews.

Trainee contribution to curriculum review will be facilitated through the involvement of trainees in local faculties of education and through informal feedback during appraisal and College meetings.

The SAC will respond rapidly to changes in service delivery. Regular review will ensure the coming together of all the stakeholders needed to deliver an up-to-date, modern specialty curriculum. The curriculum will indicate the last date of formal review monitoring and document revision.

## **9 Equality and diversity**

The Aviation and Space Medicine SAC has taken into account those with protected characteristics as defined by the Equality Act 2010 when developing this curriculum and is confident that there is no discrimination and/or disadvantage for any protected group.

The Royal Colleges of Physicians and the Federation complies with, and ensure compliance, with the requirements of equality and diversity legislation set out in the Equality Act 2010. The Federation believes that equality of opportunity is fundamental to the many and varied ways in which individuals become involved with the Colleges, either as members of staff and Officers; as advisers from the medical profession; as members of the Colleges' professional bodies or as doctors in training and examination candidates. Accordingly, it warmly welcomes contributors and applicants from as diverse a population as possible, and actively seeks to recruit

people to all its activities regardless of race, religion, ethnic origin, disability, age, gender or sexual orientation.

LETBs/deaneries quality assurance will ensure that each training programme complies with the equality and diversity standards in postgraduate medical training as set by GMC.

Compliance with anti-discriminatory practice will be assured through:

- monitoring of recruitment processes;
- ensuring all College representatives and Programme Directors have attended appropriate training sessions prior to appointment or within 12 months of taking up post;
- LETBs must ensure that educational supervisors have had equality and diversity training (for example, an e learning module) every 3 years
- LETBs must ensure that any specialist participating in trainee interview/appointments committees or processes has had equality and diversity training (at least as an e module) every 3 years.
- ensuring trainees have an appropriate, confidential and supportive route to report examples of inappropriate behaviour of a discriminatory nature. LETBs and Programme Directors must ensure that on appointment trainees are made aware of the route in which inappropriate or discriminatory behaviour can be reported and supplied with contact names and numbers. LETBs must also ensure contingency mechanisms are in place if trainees feel unhappy with the response or uncomfortable with the contact individual.
- monitoring of College Examinations;
- ensuring all assessments discriminate on objective and appropriate criteria and do not unfairly disadvantage trainees because of gender, ethnicity, sexual orientation or disability (other than that which would make it impossible to practise safely as a physician). All efforts shall be made to ensure the participation of people with a disability in training.



## APPENDIX A

### COMPOSITION OF THE AVIATION AND SPACE MEDICINE COMMITTEE

#### Current members

Prof David Gradwell (Chair)	Kings College London
Gp Capt David McLoughlin	RAF
Surg Cdr Daryll Wylie	RN
Lt Col Ian Curry	Army
Wing Commander Nicholas Green	Royal Aeronautical Society
Wing Commander Matthew Lewis	RAF
Sqn Ldr Peter Hodkinson	RAF/Trainee Representative
Dr Sally Evans	CAA
Dr Kevin Fong	Space Medicine
Dr Helen Hoar	BALPA
Dr Julia Whiteman	COPMeD
Dr Euan Hutchinson	CAA
Dr Raymond Johnston	FOM
Dr Henry Lupa	QinetiQ
Dr Elizabeth Wilkinson	British Airways
Dr John Roberts	NATS
Dr Geoffrey Tothill	First Assist
Mr Peter Tait	Lay member

#### Previous members

Dr Anthony Batchelor  
Group Captain David Bruce  
Dr Nigel Dowdall  
Lt Col Mike Harrigan  
Dr Stuart Mitchell  
Professor David Snashall  
Dr Elizabeth Hughes

#### JRCPTB

Professor Bill Burr  
Professor David Black  
Felicity Stuart  
Hannah Watts  
Zoë Fleet