

SPECIALTY TRAINING CURRICULUM

FOR

SPORT AND EXERCISE MEDICINE

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Prepared by the Faculty of Sport and Exercise Medicine (UK)

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GLOSSARY

ACPSM	Association of Chartered Physiotherapists in Sports Medicine
ACT	Activity Co-ordination Team, DCMS/DH
AHP	Allied Health Professionals
BASEM	British Association of Sport and Exercise Medicine
BMA	British Medical Association
BJSM	British Journal of Sports Medicine
BMJ	British Medical Journal
CESR	Certificate of eligibility for Specialist Register
CCT	Certificate of Completion of Training
CMO	Chief Medical Officer
DH	Department of Health
DCMS	Department for Culture, Media and Sport
DfES	Department for Education and Skills
FSEM(UK)	Faculty of Sport & Exercise Medicine (UK)
GMC	General Medical Council
GPwSI	General Practitioner with Special Interest
HCI	Home Country Institute (sports)
HPC	Health Professions Council
IABSEM	Intercollegiate Academic Board for Sport and Exercise Medicine
MFSEM(UK)	Membership of the Faculty of Sport & Exercise Medicine (UK)
FFSEM(UK)	Fellowship of the Faculty of Sport and exercise Medicine (UK)
MMC	Modernising medical careers
MRCGP	Membership of Royal College of General Practitioners
MRCP	Membership of Royal College of Physicians
MRCS	Membership of Royal College of Surgeons
NGB	National Governing Body (of Sport)
NHS	National Health Service
PCT	Primary Care Trust
PMETB	Post-graduate Medical Education and Training Board
SAC	Specialty Advisory Committee
SEM	Sport and Exercise Medicine
STA	Specialist Training Authority
ST	Specialist Training
UKADIS	UK Association for Doctors in Sport (merged with BASEM)
UKSI	United Kingdom Sports Institute

SPORT AND EXERCISE MEDICINE

1 RATIONALE

1.1 Introduction

This document describes Specialist Training (ST) for doctors wishing to specialise in the field of the Sport and Exercise Medicine (SEM). Aims and objectives for both general professional and specialty specific learning are provided as well details of how that learning will be supported and assessed in the practice of SEM. The training structure is also described.

1.2 Rationale

One of the great medical challenges over the coming century is to reverse the slide towards a sedentary population. The technological advances seen over the past century have been labour-saving and time-saving. These same advances however have resulted in a population that is generally required to perform less physical activity than at any other stage in human existence. Medical conditions such as obesity, diabetes, hyperlipidaemia, osteoporosis, cardiovascular disease and mental illness can all be at least partially attributed to a sedentary lifestyle. Certainly exercise has been well proven to provide therapeutic benefit in each of these conditions. Studies demonstrate that those who exercise regularly are likely to contribute in a positive way to society. Children who exercise regularly are more likely to continue as exercisers and be successful at sport with its inherent benefits for self esteem, health and social skills. These issues have all been recently addressed by the government White Paper: Choosing Health.

While governments struggle under the burden of increasing health-care costs, there is a real need for proactive support structures for those who wish to exercise, as part of healthy living. Training in SEM provides doctors with a specialised skill set that enables them to treat and encourage the exercising individual. Knowledge of the health benefits of exercise and of optimal exercise regimes for specific subgroups, allows SEM specialists to promote an active lifestyle to those groups who can benefit most.

SEM specialists require a broad range of clinical skills for dealing with medical illness in those who wish to exercise, as well as for treatment of musculoskeletal pathology. SEM now represents a distinct body of knowledge. There will always be common ground with other specialist areas of knowledge such as general practice, orthopaedics, accident and emergency, rheumatology, rehabilitation medicine, physiotherapy and neurology. SEM specialists however have specialist training which is focused on the beneficial effects of exercise on health, and the effects that medical conditions have on the individual's capacity to exercise. Giving encouragement and assistance to individuals and groups in their endeavours to be active today, provides a holistic and effective means of addressing the population health challenges of tomorrow.

The document describes the body of knowledge and professional practice which defines SEM.

1.3 The role of the specialist in SEM

The SEM consultant participates in a variety of activities and has a number of roles spanning primary and secondary care. While the training programme includes obligatory "core" knowledge and skills, the flexibility within the training programme allows the trainee to pursue areas of special interest. SEM physicians will therefore have a variety of areas of special expertise to satisfy the diversity of needs within the community. Some of the roles which will be common to all SEM physicians however will include the following;

Clinical

- To take responsibility for providing accurate diagnosis for those individuals with injury or illness who would like to exercise, or for whom exercise would be beneficial
- To provide leadership in providing clinical management of individuals with injury or illness.
- To provide a high level of clinical expertise and a professional standard of communication for clinicians referring patients for a professional opinion.
- To work closely with allied health professionals to ensure that the patient receives the highest level of clinical care and each stage of their treatment process.
- To work within the sporting environment to ensure a safe exercising environment for participants
- To promote the highest level of ethical standards within the sporting environment by contribution to sporting organisations and teams

Public Health

- As part of a multi-disciplinary team encourage and promote physical activity as a lever for healthy living
- To identify impediments to an active lifestyle and work within a multi-disciplinary framework to remove those impediments or minimise their impact
- To work alongside local health authorities / public health clinicians/ PCT's in planning / developing exercise opportunities for the general public for health gain
- To liaise with local authorities / education / voluntary and private sector so as to advise on the health aspects of exercise programmes

Managerial

- To establish courteous and respectful relationships with general practitioners and other clinicians for the betterment of patient care
- To work with specialists in other fields such as general practice, orthopaedics, rheumatology, accident and emergency, rehabilitation and neurology to further understanding of medical conditions affecting the active population
- To liaise with health authorities at all levels for provision of resources to promote increased physical activity for the general population in the interests of improved community health
- To establish liaison with other agencies such as social services, housing, education, unemployment, voluntary agencies and the private sector, involved in the provision of services to physically disabled people in the community
- To contribute to organisations which promote the dissemination of SEM knowledge throughout the community for the betterment of community health and for the advancement of sport

Education and Research

- To participate in regular clinical audit
- To promote original scientific research to develop and expand the understanding of SEM
- To critically review scientific literature and apply evidence based principles to the practice of SEM
- To actively participate in educational activities for children, community groups, sporting organisations, athletes and other medical professionals to promote an active lifestyle and to improve safety standards in sport
- To participate in approved training programmes in SEM: foundation programmes, basic specialty training and higher specialty training.

1.4 Responsibility for the curriculum

The Medical Director of the JRCPTB is responsible for the curriculum.

It was prepared by members of the Faculty of Sport and Exercise Medicine UK. The primary contributors were:

Prof Mark Batt, Vice-President and Chair of SAC, Faculty Sport & Exercise Medicine

Maggie Hunter, Educationalist, Trent postgraduate deanery

Dr David Hughes, Australian College of Sport Physicians

Prof Donald Macleod, Intercollegiate Board Sport & Exercise Medicine

Prof W Angus Wallace, Faculty Sport & Exercise Medicine

Prof Michael Cullen, British Association of Sport & Exercise Medicine

Others:

Many other people were involved in the development of the curriculum and these are listed in Appendix 2.

1.5 Entry requirements

It is recognised that SEM is a broad medical specialty and this is reflected in its specialty training curriculum and entry points. Thus:

- Applicants for Specialist Training (ST) should have completed a minimum of two years Foundation Training (F1 and F2 years)
- Applicants for medical specialist training will have satisfactorily completed and obtained the competences of the Foundation training programme, the evidence being full registration with the General Medical Council and a certificate of completion of Foundation training or equivalent.
- A selection centre will be used to select doctors wishing to undertake specialty training in SEM – the selection centre will run towards the end of F2 year. If selected, these doctors would progress to ST1 and 2 - these years may be taken as CMT or ACCS or GP run through training or equivalent.
- Progression to ST3 is dependent upon successful completion of ST1 and ST2 with the acquisition of competences required for the assessment and management of medically ill patients in a variety of settings.

Prior to the Foundation programmes becoming universally established, applications from other training routes may be considered. Such applicants would be expected to have the FSEM Diploma or equivalent (if entering at ST5) and a minimum of 3 years broad medical experience. Selection on this basis will be through an assessment centre. Dependent upon an individual's knowledge and competencies they will start training within ST2-ST5 years as 'top-up' trainees. These trainees would have a NTN but would not have completed full CCT training and will thus need to apply for a Certificate of Eligibility for the Specialist Register (CESR) through PMETB. .

Specialist trainees from other medical specialties may also apply to enter ST in SEM for one year of flexible training. In the future dual CCT training may be considered as determined by the demands and the needs of the medical workforce. Such dual CCT programmes will be bespoke with trainees receiving two CCT. In this case they must have applied for and successfully entered a training programme which was advertised openly as a dual training programme. This programme will need to achieve the competencies as described in both curricula and there must be jointly agreed assessments (proposed by both SACs and approved by PMETB). Postgraduate deans wishing to advertise such programmes will ensure that they meet the requirements of both SACs.

1.6 Duration and Organisation of Training Programme

The indicative duration of core training is 6 years. There are two initial years of core training, (ST1-2), followed by four further years taken as specialty training (ST 3-6). At least 3 of the 4 years must comprise supervised clinical training in a regional training programme approved by PMETB but with relevant input from the deanery and the specialty (SAC). It is essential that the trainee spend a period, equivalent to at least 6 months full-time with a variety of sports teams or settings under the supervision of an approved trainer during the four years of specialty training. The construction of the programme will be flexible to ensure that trainees from different backgrounds complete the programme with a similar breadth of experience. A period of longitudinal training in primary care is mandatory and training in aspects of relevant Public Health Medicine and General Practice is expected (typically in ST3).

Thus from the start of SEM training at ST1 to completion at ST6 trainees are expected to gain specific competencies irrespective of their entry point at ST1 (CMT, ACCS or GP run through training). Central to the early years of SEM specialty training is the development of competencies to enable the trainee to identify and manage sick patients. This is considered a 'corner stone' of SEM practice and thus essential before proceeding with the ST3-ST6 years of specialty training.

The SEM training programme to which the trainee is appointed will have named approved trainers (educational supervisors) for each element of the programme. In addition, one consultant/ specialist within the same deanery or group of deaneries will act as Training Programme Director. Specialty training in SEM may provide experience in both the National Health Service and the private sector within approved clinics/settings. The training will be overseen by the Specialist Advisory Committee (SAC) in SEM and the Postgraduate Dean for SEM.

1.7 Aim of training

The primary purpose of training in SEM is the development of a specialist who has the appropriate level of knowledge, skills, attitudes and competence to work independently and effectively as a consultant in the NHS. Patient-centred approaches and team working are of vital importance. Training should be enjoyable in order to facilitate the learning of the trainee.

In keeping with guidelines provided by the PMETB, the curriculum provides:

- opportunities for self-directed learning
- regular feedback from educational supervisors and trainers to the trainee
- appropriate career advice and counselling
- processes for extra support
- processes for mediation and retraining

1.8 Structure of medical training for SEM:

Generic and specialty curriculum

This specialty curriculum is complementary to the generic curriculum which applies to all 28 'physicianly' specialities. The generic curriculum follows the headings of good medical practice and runs through from core training to CCT (see fig 1). Trainees are expected to read and understand both their specialty curriculum and the generic curriculum. Both curricula should be seen as integrated so that generic competencies are acquired at all stages of specialty training. Some generic components are also further expanded and deepened for some aspects of the specialty.

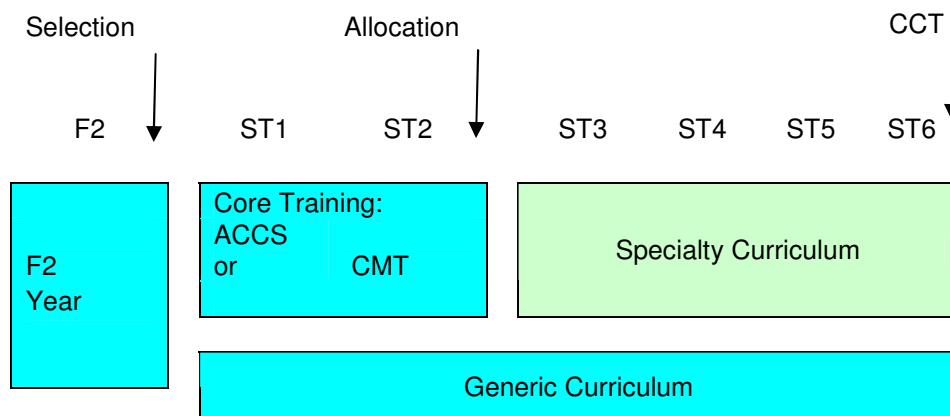
Early stages of training

The need for trainees to have obtained some clinical experience before progressing to the ST3 stage of their specialty training is appreciated. It is felt that this would be best achieved through Core Medical Training (CMT) stage of the medical specialty programmes, but the Faculty was keen to retain flexibility and allow trainees from backgrounds other than CMT to join SEM programmes. It is PMETB's legal responsibility is to approve the entire post-foundation training, and as such the early stages of training are now set out in this curriculum document. Following Foundation training SEM trainees may access specialist training (ST3-ST6) through core training years (ST1 and ST2 or equivalent programmes) of:

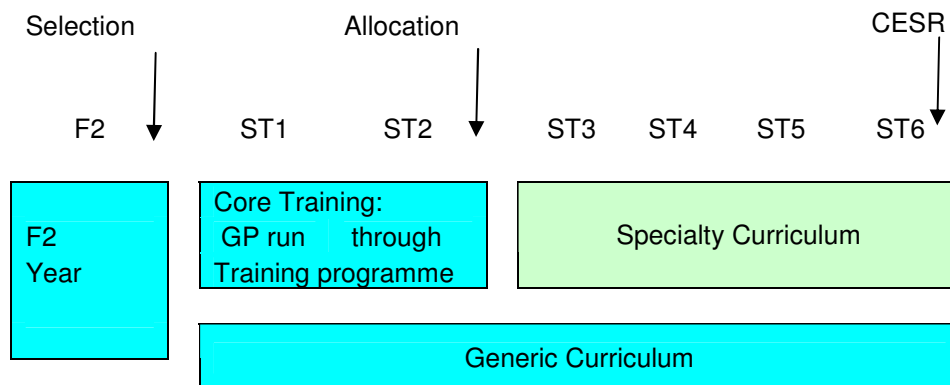
1. CMT or
2. ACCS or
3. GP Run through training (Trainees entering ST3 after GP run through training will be eligible for a CESR, not a CCT, through PMETB)

On entry into Specialty Training the educational and training needs of individual trainees will be assessed with Regional Heads of training to appropriately match individual learning needs, and hence the structure of Specialty Training.

Diagrammatic representation of specialty and generic curricula



Diagrammatic representation of specialty and generic curricula (GPVTS entry into SEM Specialty Training)



The activities which will allow the trainee to acquire that knowledge and expected competences are described. The training programme is highly flexible, allowing individualisation based on response to the unique educational requirements of each trainee. Personal and professional development needs, career paths and goals will be addressed within the programme as part of the appraisal and RITA process.

Details of the appraisal and assessment processes are provided along with examples of the required documentation. The trainee is responsible for ensuring compliance with provision of all necessary documents and for the safe storage of all original assessment reports. They should be contained within the Training Record file. The Training Record will be submitted at the end of training and is critical to the process of awarding CCT.

1.8.1 Research

Conducting regular clinical audit is an essential part of specialty training (ST) in SEM. Further original clinical research in SEM is encouraged and expected, but not mandated. Trainees will be supported in attempts to publish quality research in peer-reviewed journals. Trainees who wish to acquire extensive research competencies, in addition to those specified in the generic element of the curriculum, may undertake a research project as an ideal way of obtaining those competencies, all options can be considered including taking time out of programme to complete a specified project or research degree. Time out of programme needs prospective approval from the PMETB, assuming the SAC has deemed the experience suitable and the period of study supported by the Postgraduate Dean. Funding will need to be identified for the duration of the research period. A maximum period of 3 years out of programme is allowed.

1.8.2 Flexible Training

Trainees who are unable to work full-time are entitled to opt for flexible training programmes. EC Directive 93/16/EEC requires that:

- i. *Part-time training shall meet the same requirements as full-time training, from which it will differ only in the possibility of limiting participation in medical activities to a period of at least half of that provided for full-time trainees.*
- ii. *The competent authorities shall ensure that the total duration and quality of part-time training of specialists are not less than those of full-time trainees.*

The above provisions will be adhered to. For details of appointment and funding arrangements for flexible trainees, please see the 'Guide to Specialist Registrar Training' (February 1998).

1.8.3 Training Record

The trainee will maintain a training record. It will be counter-signed as appropriate by Educational Supervisors to confirm the satisfactory fulfilment of the required training experience, and the acquisition of the competences that are outlined in the Specialty syllabus. It will remain the property of the trainee, and must be produced at assessment, appraisal and RITA events.

1.8.4 Appraisal

A formal process of appraisal will form an integral part of the training programme. Appraisal is designed to assist trainees and help prevent them from developing difficulties in training. The appraisal is led by the trainee and aims:

- To set out personal and professional development needs, career paths and goals
- To agree plans for the needs to be met
- To discuss progress and performance
- To consider the doctor's contribution to the quality and improvement of local healthcare services

The trainee will meet regularly with the educational supervisor to discuss their current activities and progress to date. Educational needs will be identified and reviewed. A strategy will then be devised for achieving educational goals in the future. The trainee will be supported in achieving these goals.

2 CONTENT OF LEARNING

A description of each of the education modules follows;

MODULE 1: SCIENTIFIC KNOWLEDGE

1-A: Exercise Physiology

Knowledge

1. Origins and applications of exercise physiology basic and applied
2. Cellular metabolism and biomechanical pathways of energy production
 - Aerobic, anaerobic, intramuscular phosphate
3. Human energy transfer systems during exercise
 - Energy release from various sources including fats, carbohydrates, proteins
 - Substrate utilisation during exercise
4. Energy systems in exercise
 - Immediate and long term
 - Lactate transfer
 - VO₂ kinetics, oxygen lag/debt
5. Measurement/ energy costs of exercise
 - Basal metabolic rates
 - Calorimetry / daily energy expenditure
6. Cardiovascular response and adaptations to exercise
 - Blood pressure/ Cardiac output/ effects of training
7. Respiratory response and adaptations to exercise
8. Neuromuscular response to exercise
 - Motor units
 - Skeletal muscle structure/ function
 - Fibre types
9. Evaluating exercise metabolism / neuromuscular activity
10. Hormones and endocrine systems in exercise
11. Principles of training
 - Aerobic
 - Anaerobic
 - Adaptations to training
 - Training regimes
 - Maintenance and over- reaching

12. Strength and conditioning
 - Anabolic and catabolic processes
 - Resistance/ eccentric training
 - Children/ pregnancy
 - Physiological changes
 - Affect on muscle/ bone/ neural/ cardiovascular system
 - Monitoring of training principles
13. Monitoring of exercise capacity/ training/ overtraining
14. Fitness assessment
 - Definition
 - Different components of fitness
 - Rationale for performing assessment
 - Tests for aerobic fitness, anaerobic fitness, strength, power, flexibility, body composition
15. Environment and exercise
 - Thermoregulation/circulation/ hypothalamic response
 - Exercise at altitude
 - Exercise in the heat
 - Exercise in the cold
 - Exercise under water
 - Exercise in low gravity
 - Principles of training and adaptations in extreme environment
16. Ergogenic aids
17. Genetics and exercise

Skills

1. Calculating energy utilisation
2. Estimating maximal oxygen consumption
3. Lung function testing
4. Isokinetic testing
5. Force measurement

Experience

1. Work with exercise physiologist including involvement with environmental studies and physiological testing
2. Interaction with sports science and medicine team e.g. in elite sports team environment

1-B: Clinical Anatomy

Knowledge

1. Clinically relevant regional anatomy, including the upper limb, lower limb, groin & pelvis, head & neck, thorax and abdomen, cervical spine, thoracolumbar spine
2. Normal variations in anatomy and the relevance for injury risk, injury prevention and injury management

Skills

1. Ability to relate anatomical knowledge to history taking and physical examination
2. Ability to relate anatomical knowledge to interpretation of medical imaging

Experience

1. Regular tutorials with discussion of relevant anatomy
2. Exposure to clinical anatomy in supervised training posts
3. Review of anatomical knowledge at cadaver dissection sessions, as required

1-C: Nutrition and Exercise

Knowledge

1. Macronutrients and energy
 - Carbohydrate, fat, protein
 - Recommended daily allowances and nutrient sources
 - Calorific values and net energy values
2. Micronutrients
 - Vitamins
 - Vitamin supplementation
 - Minerals (and effect on exercise performance)
3. Hydration for Exercise
 - Water in the body
 - Fluid replacement during exercise
 - Fluid balance and exercise performance
4. Substrate utilisation during exercise
 - Principles of glucose, lipid and protein utilisation
 - Influence of diet on substrate utilisation
5. Diet and exercise in extreme environments
6. Body composition
 - Gross composition of human body
 - Body mass index
 - Methods of assessment
 - Health risks of different body types
7. Diet and health
 - Effect of diet and exercise on cardiovascular health
 - Effects of diet and exercise on development and management of diabetes
8. Obesity, exercise and weight control
 - Principles of energy balance
 - Exercise in obese individuals
 - Different diet regimes
 - Exercise and weight loss
9. Nutrition for exercise
 - Pre-competition
 - Carbohydrate intake before, during and after exercise
 - Children
10. Diet, glycogen stores and endurance
11. High fat diets and exercise
12. Protein and anabolic diets
13. Supplements
14. Alcohol and exercise performance
15. Disordered eating, bone health and female athlete triad

Skills

1. Calculation of calorific expenditure
2. Formulation and analysis of food diaries
3. Food weighing
4. Calculation of body composition
5. To advise on dietary requirements for different exercise conditions/ training regimes and supplement use

Experience

1. Working with nutritionist or state registered dietician
2. Working with sports teams alongside experienced supervisor
3. Working with patients with diabetes, obesity, cardiovascular disease e.g. in outpatient clinics

MODULE 2: POPULATION HEALTH

2-A: Primary Care

Knowledge

1. Basic treatment options for common conditions seen in General practice including ENT, respiratory, cardiology, gastroenterology, ophthalmology, and dermatology
2. Immediate management of common musculoskeletal injuries
3. Referral procedures to secondary services
4. Indications and contraindications for exercise in healthy population and those with medical conditions
5. Challenges facing deprived communities and ethnic minorities
6. Effects of medications on exercise tolerance
7. Understanding of community physiotherapy services

Skills

1. Basic examination skills of all systems
2. Basic history taking
3. Basic counselling skills
4. Exercise prescription and understanding of GP referral schemes

Experience

1. During F1/2 and HST a minimum of 6 months in general practice – inner city base ideal
2. Attendance at appropriate courses such as counselling skills and family planning

2-B: Population Health

This section will emphasise the benefits of exercise in primary and secondary disease prevention, working with populations and through organisations. Although exercise has proven benefits for a wide range of conditions particular emphasis will be placed on the role of exercise in cardiac disease, respiratory disease, osteoporosis, arthritis, hypertension, diabetes and mental health. This section would be working with a wide range of professionals and organisations.

Knowledge

1. Physiology of exercise and health
2. Essentials of epidemiology, overview of methods and designs
 - Epidemiology of relevant diseases: e.g. CHD, diabetes, stroke
3. Theoretical basis of health promotion
 - Working with and for communities
 - Strategic leadership in promoting physical activity
4. Evidence in physical activity/health research
 - Physical activity and effects on CHD, stroke, PVD, cancer(s),
 - Diabetes, obesity, musculoskeletal health, metabolic syndrome, etc
 - Physical activity as therapy in a range of chronic conditions
 - Effective interventions to promote physical activity
5. Public health policy in physical activity and health
 - Policy development
 - Policy implementation
6. Services supporting the promotion of physical activity and their structures
 - NHS
 - Local authority
 - Voluntary and private sector
 - Collaborative working for physical health and well being
 - Developing appropriate health programmes and services for Physical well being
 - Quality of services within an evaluative culture
7. Measuring physical activity, fitness and health in individuals and populations

Skills

1. The ability to initiate a health screening programme.
2. Skills to provide practical guidance on setting up and managing an exercise programme for people with medical problems, as well as to deal with any technical or patient problems that may arise in such a programme.
3. Undertaking a needs assessment for a target group of service.
4. Appraising the evidence for the effectiveness of a physical activity health promoting programme or services.
5. Examining the effectiveness of a relevant service.
6. Develop and promote a physical activity programme for a given population.
7. Demonstrate an understanding of the relevant services and evidence of the ability to provide leadership and work collaboratively communicating with a range of different audiences' health promoting messages.

Experience

1. Six months Public Health experience – likely taken concurrently with General Practice as 12 month block.
2. Trainees will be based in departments of public health and work collaboratively with relevant organisations and other professionals.
3. Media experience would be necessary.
4. Attendance at exercise rehabilitation sessions and community groups e.g. cardiac rehabilitation.

2-C: Effect of Illness on Exercise Capacity

Knowledge

1. Understanding of medical conditions commonly encountered in the exercising population including mental illness, acute febrile illness, epilepsy (and other neurological conditions), diabetes, bleeding disorders, cancer, asthma and vasculopathic states.
2. Understanding of the effect that these conditions may have on the individual's ability to exercise, from both an exercise capacity and safety perspective.
3. Understanding of the potential effect of medications prescribed for these conditions, on the individual's ability to exercise

Skills

1. Ability to determine the status or severity of the disease state from history, examination and investigation.
2. Ability to provide clear and safe advice to the individual regarding exercise
3. Ability to recognise the need to consult with specialists in the treatment of specific conditions.

Experience

1. Exposure to clinics dealing with specific disease states
2. Structured tutorials and lectures from experts in the treatment of specific disease states

MODULE 3: MUSCULOSKELETAL MEDICINE

3-A: General Pathology of the Musculoskeletal System

Knowledge

1. Understanding of general musculoskeletal pathology which may present in athletes including;
 - Malignancy
 - Infection
 - Inflammatory arthritis
 - Connective tissue disorders
 - Neuropathy, myopathy
 - Degenerative joint disease
 - Spinal Disorders, Developmental Disorders and Disorders of Childhood
 - Metabolic and endocrine conditions
2. Understanding of the changes which may be detectable with medical imaging and pathology testing in such conditions

Skills

1. Ability to take a thorough history and suspect non-traumatic pathology from atypical and 'red flag' features
2. Ability to detect key signs on clinical examination to suspect non-traumatic pathology
3. Ability to utilise pathology and medical imaging services to confirm or exclude non-traumatic pathology

Experience

1. Attend rheumatology, pathology and endocrine clinics
2. Attend lectures and seminars covering these conditions
3. Attend Orthopaedic and Fracture Clinics

3-B: Management of Soft Tissue and Sports Injuries

Knowledge

A. Injury Prevention

1. Pre-participation screening (addressing risk factors, including biomechanical abnormalities)
2. Evidence regarding warm-up and stretching
3. Sports equipment, including protective equipment – health and safety pertinent to sport
4. Safe preseason training regimes
5. Targeted strength and conditioning programmes
 - sport-specific
 - individual-specific
6. Training surface and shoes
7. Rule changes in sport

B. Acute Injury Management

8. The principles of managing acute soft tissue injury – lacerations, sprains, strains, contusions, haematomas
9. The principles of managing acute bone and joint injuries – dislocations, fractures, avulsion injury, epiphyseal injuries
10. Understanding of the pathological process of soft tissue injury and the possible effects of common pharmacological treatments on this process

C. Chronic/Overuse Injury management

1. The principles of assessing, investigating and managing overuse injury.

D. Principles of the conservative management of injury

11. Principles of injury rehabilitation – ligament/tendon/muscle/bone/joint
12. Multidisciplinary approach to rehabilitation
13. Protected function and progressive functional approach to rehabilitation
14. Preservation of cardiovascular fitness and role of cross-training
15. Role of manual therapies in the management of soft tissue injuries
16. The use of taping, splints, braces, orthotics.
17. An understanding of the role of joint and soft tissue injections including their limitations and potential side effects.
18. To appreciate the importance and potential for injury prevention.

E. Principles of the surgical management of musculoskeletal injury

F. Thorough understanding of the principles of tissue injury and repair

Skills

1. Management of acute injury to bone, joint and soft tissue.
2. The application of rehabilitation techniques.
3. Joint and soft tissue injection techniques.

Experience

1. Regular attendance at sports medicine clinics.
2. Attachments with experienced sports physicians at a variety of sports events to appreciate the diverse nature of on field sports medicine and acute injury management.
3. Practical experience of the techniques utilised in acute and chronic injury management.

3-C: Musculoskeletal Radiology

Knowledge

1. The role of imaging techniques in general terms and the way in which images are produced.
2. An understanding of the relative radiation risks applicable to different types of imaging.
3. The strengths and relative weaknesses of different imaging techniques and their ability to demonstrate both normal and abnormal structures within tendons, ligaments, muscles, bones and joints.
4. A full appreciation of the role of imaging in investigating patients presenting to a team physician and sports medicine specialist. This will include the investigation of patients with both acute and chronic symptoms including acute traumatic injury and chronic overuse injury.
5. The ability to construct a differential diagnosis based on history and clinical findings and the targeted use of imaging to reach a definitive diagnosis.
6. An understanding of the use of medical imaging for targeted treatment (e.g. guided injections) to complement history & examination.

Skills

1. Ability to practice musculoskeletal ultrasound including practical experience of imaging normal and abnormal muscle (to differentiate traumatic lesions) and tendons commonly associated with Tendinopathy e.g. patella, Achilles (optional)
2. An ability to interpret different modalities of medical imaging in a logical and structured manner, and in doing so identify significant pathology
3. Supervise injections utilising x-ray guidance.

Experience

1. Working within a multidisciplinary sports medicine clinic with access to all modern imaging modalities.
2. Regular discussion with musculoskeletal/sports radiology colleagues.
3. Regular attendance at x-ray meetings
4. Regular, supervised imaging-interpretation sessions in tutorials
5. Attending musculoskeletal ultrasound sessions including those in which injections are given.
6. Complete a course of musculoskeletal ultrasound (optional, see Module 8)

3-D: Gait and Biomechanical Assessment

Knowledge

1. Functional anatomy of joints and musculo-tendinous units
2. Characteristics of bone, tendon, ligament, articular cartilage, muscle under stress and strain and potential for fatigue
3. Human movement analysis – basic kinematics and kinetics
4. Biomechanical analysis of sport-specific techniques
 - swimming
 - throwing
 - jumping
 - kicking
 - running
 - boxing
 - wrestling and martial arts
5. Performance aspects of sport-specific equipment
 - racquets, bats
 - throwing implements (balls, javelin, shot-put, discus)
 - rowing boat, kayak, canoe
 - sporting footwear
 - bicycle
 - golf clubs
 - swimming suits
 - protective equipment (headgear, body protection, etc)
 - mats and playing surfaces
6. Effects of faulty biomechanics, influence of posture
7. Methods and effects of changing biomechanics
8. Principles of body morphology
 - ectomorphs, endomorphs, mesomorphs
 - sport-specific, position-specific body composition
 - assessment of body composition
 - normal body composition

Skills

1. To perform biomechanical analysis:
 - standing
 - moving
 - sports specific

Experience

1. Gait analysis clinics/teams
2. Orthotic provision
3. Report of one case involving biomechanical assessment, video analysis and multidisciplinary management
4. Biomechanics experience with podiatrist / physiotherapy / biomechanist
5. Attend workshops on orthotic construction

MODULE 4: WORKING WITHIN THE TEAM ENVIRONMENT

4-A: Team Physician

Knowledge

1. The role of the team physician
2. Pre-participation screening
 - Aims and challenges of pre-participation screening
 - Justification for pre-participation screening
 - Sport-specific pre-participation screening
 - Screening components (questionnaire, history, examination, investigation)
3. Health education and pre-season assessment
4. Acquisition of skills and physique
5. Protective equipment
6. Medical equipment, pharmacy supplies required for coverage of teams
7. Structuring training to prevent injury
8. Doping classes and methods/ permitted use of banned drugs/ doping control
9. Traveller's health issues, combating jet lag and immunisations
10. Athlete confidentiality and medico-legal aspects of team care
11. Disordered eating, female athlete triad
12. Child protection

Skills

1. Communication skills
 - Coaches/ athletes/ medical team/ media
2. Ability to prepare a medical team for travel
3. Ability to monitor environment/ hygiene/ facilities
4. Ability to work both with individual athletes and a team
5. Ability to undertake pre-hospital care of an injured athlete
6. Show adequate record keeping

Experience

1. Supervised for minimum of 2 years as physician in team sporting environment
2. Maintain a logbook of athletes and, teams and conditions seen
3. Experience of travelling with a variety of teams
4. Attend appropriate courses such as Advanced Life Support
5. Child protection course

4-B: Event Physician

Knowledge

1. Legislative and medico-legal guidelines with regard to medical and crowd safety facilities at sporting venues
2. Guidelines for number and type of medical personnel required for sporting events with large participant numbers and/or large crowds
3. Relevant EU safety legislation governing the running of sporting events with large participation numbers and/or large crowds
4. Procedures for evacuation of injured athlete or member of the crowd from any given sporting event
5. Procedures for evaluating requirements in terms of pharmacy supplies, medical equipment, medical personnel, paramedical personnel and communication equipment at any given sporting event

Skills

1. Lead medical team at a sporting event involving large participation numbers and/or large crowd numbers, such that medical coverage is sufficient and complies with relevant legislative and medico-legal requirements
2. Evaluate requirements in terms of pharmacy supplies, medical equipment, medical personnel, paramedical personnel and communication equipment at any given sporting event
3. Establish protocols for evacuation of injured athlete and/or member of crowd from sporting event

Experience

1. Assist with provision of medical services at sporting events with large participation numbers and/or large crowd numbers
2. Attend courses and lectures regarding provision of medical services at such events
3. Obtain and read documents relating to relevant legislative and medico-legal requirements

4-C: Specific Sports

Knowledge

1. Familiarity with a wide variety of sports in terms of rules and regulations, physiological requirements and injury risk profiles
2. These sports to include
 - Football
 - Cricket
 - Rugby codes
 - Field hockey
 - Basketball
 - Netball
 - Swimming
 - Track and field events
 - Cycling
 - Rowing
 - Gymnastics
 - Triathlon
 - Water polo
 - Tennis, Squash and other racket sports
 - Martial arts, Wrestling, Boxing
 - Volleyball
 - Golf
 - Gaelic and other regional sports

Skills

1. Demonstrate a familiarity with the above sports with regards to rules and regulations, physiological requirements and injury risk profile
2. Provide medical treatment for athletes involved in these sports
3. Provide advice to team management regarding pre-participation screening, training programs, injury risk management and injury treatment, for any of these sports

Experience

1. Spend time with teams involved in these sports
2. Attend appropriate courses relating to the care of athletes involved in these sports

MODULE 5: MEDICAL EMERGENCIES

5-A: Head injury and Concussion

Knowledge

1. Pathophysiology of concussion
2. Various definitions of concussion
3. Grading concussion severity – historical perspectives
4. Understanding of possible significant complications
5. Assessment of concussion
 - On field retrieval - principles of immediate management
 - ‘Red flags’ on history and examination
 - Neuropsychological testing techniques, including computer-based
6. Understanding of short and long-term sequelae of concussion
7. Rehabilitation of concussed athlete
8. Rationale for return to play
9. Sport-specific regulations
10. Maxillofacial and dental issues

Skills

1. Lead on field retrieval team and provide appropriate immediate management
2. Diagnose concussion on history, examination and neuropsychological testing
3. Clinically detect significant deterioration and provide appropriate management
4. Familiarity with neuropsychological testing techniques (including computer-based)
5. Provide safe and scientifically sound advice to athletes and team management regarding return to sport

Experience

1. Medical coverage of contact sports where concussion prevalence is significant
2. Tutorials, lectures updating evidence-based management of concussion
3. REMO course (desirable) – see below

5-B: Sudden Death in Sport

Knowledge

1. Incidence and prevalence of sudden death in sport
2. Aetiology of sudden death in sport
 - Age-related factors
 - Sport-specific factors
3. Cardiological causes, including
 - HOCM
 - Coronary artery anomalies
 - Coronary artery disease
 - Conduction abnormalities
 - Structural derangements including valvular disease and Marfan's syndrome
4. Traumatic causes including
 - Head injury
 - Extracranial/maxillofacial pathology
 - Intracranial pathology, raised intracranial pressure
 - Diffuse and focal pathology
 - Abdominal injury
 - Chest injury
5. Environmental factors
6. Understanding of the role of pre-participation screening

Skills

1. Implement strategies to reduce risk of sudden death in sport
2. Ability to identify at risk athletes through history, examination and appropriate investigation
3. Ability to manage athletes with known risk factors

Experience

1. Provide coverage at contact sport events
2. Attend cardiological testing sessions
3. Read ECGs and identify relevant patterns of pathology
4. Observe echocardiograms
5. Attend clinic specialising in connective tissue diseases, including Marfan's syndrome
6. Successfully complete ALS, Pre-hospital Care Course, REMO or other approved course providing skills in resuscitation
7. Participate in pre-participation screening

5-C: Resuscitation Training

Knowledge

1. On field assessment including basic life support, advanced life support, shock, anaphylaxis, basic and advanced airway management, spinal immobilisation and principles of safe patient transfer.
2. Basic pharmacology of drugs used in resuscitation
3. Thorough understanding of the principles of care for the unconscious patient
4. Basic knowledge of the principles of trauma care
5. Principles of the management of spinal injury, head injury, thermal injury, chest and abdominal injury eye trauma, dental trauma and genitourinary trauma.

Skills

1. Ability to assess an accident scene
 - optimise safety at accident scene for the injured and the rescue team
2. Cardiopulmonary resuscitation: both expired air resuscitation and external cardiac compressions
3. Competency in defibrillation: manual and automated external defibrillators
4. Basic airway manoeuvres: jaw thrust, chin lift, head tilt
5. Airway adjuncts: nasopharyngeal airways and oropharyngeal airways including sizing and indications for use
6. Advanced airway techniques: laryngeal mask airways, combitubes, endotracheal intubation
7. Needle thoracotomy
8. Needle cricothyroidotomy
9. Safe transfer onto spinal board
10. Log roll
11. Splinting of pelvic and lower limb fractures
12. Treatment of major open fractures

Experience

1. Ambulance observer sessions
2. Theatre sessions for airway management
3. Accident and emergency sessions (3 months minimum)
4. Advanced life support status
5. Successfully complete ALS, Pre-hospital Care Course, REMO or other approved course providing skills in resuscitation

5-D: Accident and Emergency

Knowledge

1. Basic triage of injuries
2. Acute assessment and treatment of soft tissue injuries
3. Principles of basic fracture management
4. Knowledge of common fractures and dislocations in upper and lower limbs
5. Assessment and treatment of minor and major head injuries
6. Differential diagnoses in acute eye trauma
7. Differential diagnoses in acute ear, nose and throat trauma
8. Understanding of the principles and practice of local anaesthetic use including field and regional anaesthesia

Skills

1. Common fracture manipulations: fingers and ankles
2. Reduction of common dislocations: shoulder, elbow, fingers, patella, ankle and toes
3. Skin and subcutaneous suturing
4. Examination of head and central nervous system to detect skull/ basal skull fractures and major intracranial pathology
5. Examination of external eye and retina
6. Examination of nose: recognition of septal pathology
7. Competency in use of sedation with thorough awareness of indications and contraindications
8. Familiarity of use of different local anaesthetics
9. Regional anaesthetic techniques: eye, axillary block, shoulder infiltration, femoral blocks, ankle blocks and ring blocks

Experience

1. Minimum of 3 months of accident and emergency training in an approved centre

MODULE 6: DRUGS IN SPORT

Knowledge

1. Understanding of effects of various pharmaceutical agents on exercise performance
2. History of Drugs in Sport
3. Banned substances/methods
 - Potential harmful side-effects of banned performance-enhancing substances/methods
 - Procedures for obtaining accurate and current information regarding Drugs in Sport
 - Legal implications for the doctor and the athlete
 - Sport-specific patterns of abuse
 - Sport-specific regulations regarding specific substances
 - Medical exceptions
 - Testing procedures, and the doctor's role in such procedures
4. Therapeutic use of drugs for illness and injury
 - Pharmacology of NSAIDs
 - Effects of therapeutic medications on injury healing
 - Effects of therapeutic medications on exercise performance
5. Education of athletes and administrators – the doctor's roles & responsibilities
6. Regulatory authorities including government, IOC, WADA and individual sporting organisations

Skills

1. Educate players and management regarding Drugs in Sport
2. Access current information regarding Drugs in Sport
3. Advise athletes regarding appropriate pharmacological treatment of medical conditions
4. Clinically suspect use of banned substances/methods
5. Adhere strictly to relevant government legislation and sporting regulations
6. Provide appropriate support to the athlete during testing procedures

Experience

1. Constantly review the latest information regarding Drugs in Sport
2. Attend lectures, seminars provided by testing authorities
3. Provide educational lectures to players and team management
4. Attend and observe drug testing procedures

MODULE 7: PSYCHOSOCIAL ASPECTS OF SPORT AND EXERCISE MEDICINE

Knowledge

1. Awareness of motor learning, selective attention and information processing theories and models
2. Psychology of behavioural change – sedentary to active living
3. Psychological aspects of stress, trauma, disability, rehabilitation, and failure in sport
4. Psychological aspects of motivation, arousal and performance
5. Group psychology: of team, coach, medical team, group dynamics, behaviour remodelling
6. Psychological/ mood effects of physical activity
7. Sociology of sport: including violence in sport, behavioural norm and values in sport, effect of sport and physical activity on socialisation, influence of role models, drug issues in sport.
8. Psychosocial effects of retirement from sport

Skills

1. Interpretation of the results of psychological, psychometric, social and vocational assessments
2. Counselling skills, including understanding of its benefits and limitations
3. Recognition of psychosocial influences on performance
4. Management of psychological effects of failure
5. Management of multi-professional team including appreciation of the role of sports psychologist in group and individual performance
6. Recognition, assessment and counselling of athletes with suspected eating disorders

Experience

1. Working with a sports psychologist on an individual and group basis, in training, pre-competition and competition environment
2. Management of athletes with psychological problems due to failure and social problems
3. Experience with psychologist working in community exercise programmes
4. Attendance of appropriate courses and meeting e.g. counselling course

MODULE 8: INVESTIGATIONS AND PROCEDURES

Knowledge

1. Knowledge of muscle and nerve physiology – the motor unit
2. Understanding of the methodology behind electrophysiological testing (NCS and EMG)
3. An understanding of the indications for electrophysiological studies and their strengths and weaknesses.
4. Be able to describe the components of the normal EMG and NCS
5. Understanding of the EMG findings in denervated muscle, myopathy and inflammatory myositis
6. Be able to describe the three main types of nerve injury (neuropraxia, axonotmesis, and neurotmesis).
7. Thorough knowledge of muscle compartment anatomy, specifically related to possible complications of muscle compartment pressure testing
8. Joint anatomy, specifically related to possible complications of aspiration/injection of joints
9. Principles of lower limb biomechanics and the use of orthotics
10. Principles and techniques of musculoskeletal ultrasonography

Skills (mandatory)

1. Perform lower limb biomechanical assessment and construct basic foot orthotics, as appropriate
2. Safely inject major joints including shoulder, elbow, knee and ankle
3. Safely perform compartment pressure tests for the four major compartments of the lower leg

Skills (optional)

1. Perform EMG and nerve conduction studies
2. Perform cardiological stress testing
3. Perform injections with and without x-ray guidance of other joints including zygo-apophyseal, hip, sacroiliac, wrist etc
4. Perform ultrasound examination for common musculoskeletal conditions

Experience

1. Attend clinics where lower limb biomechanical assessment and orthotics construction are undertaken
2. Attend workshops on construction of foot orthotics
3. Attend clinics where EMG and NCS testing is performed
4. Attend clinics where muscle compartment pressure testing is performed
5. Attend joint injection workshops
6. Attend cardiology clinics where exercise stress testing is performed
7. Complete formal course of instruction in musculoskeletal ultrasonography where appropriate qualification is gained (optional)

MODULE 9: SPINAL INJURIES, AMPUTEE REHABILITATION AND DISABILITY SPORT

Knowledge

1. Awareness of the special needs of disabled athletes and exercisers e.g. cerebral palsy, amputees, visually and hearing impaired, learning difficulties etc
2. Awareness of the special medical needs of disabled athletes and exercisers e.g. knowledge of catheters, pressure sores, stump care etc
3. Have an understanding of the physical problems experienced by amputees and wheelchair users with everyday living and with respect to sport
4. Have knowledge of the types of prosthesis available, particularly those used for sport
5. Have knowledge of the types of wheelchair available and adaptations required for different sports
6. Awareness of support groups and sports organisations for disabled people
7. Knowledge of the effects of spinal injury at different vertebral levels
8. Awareness of disability classification and relevant competition rules and regulations – Special Olympics, Paralympics Associations

Skills

1. Learn how to prescribe prostheses, orthoses, wheelchairs and other assistive devices
2. Assessment of injuries in disabled athletes
3. Recognition and treatment of autonomic dys-reflexia

Experience

1. Work with members of the multi-professional team, including physiotherapists, engineering and technical staff in assessment of disabled patients for equipment and exercise needs
2. Work with disabled sports teams and British Paralympic Association
3. Gain additional experience, in spinal unit or equivalent, of management of acute and chronic spinal injured patients/ amputees

MODULE 10: PHYSICAL ACTIVITY IN SPECIAL GROUPS

Knowledge

Women

1. Understanding on the effect of hormone cycles on performance
2. Understanding the effects of exercise on the menstrual cycle
3. Principles of manipulation of menstrual cycle
4. Contraception options for athletes and the relevant merits & disadvantages in relation to performance
5. Understanding of the relationship between hormones, weight, osteoporosis and stress fractures in female athletes
6. Relationship between pregnancy and exercise, in terms of both safety and performance
7. Principles of return to exercise postpartum
8. Understanding of gender differences in exercise

Older athletes

1. Understanding of the effect of ageing on muscle bulk, cardiovascular fitness, endurance etc
2. Knowledge of considerations when exercising with chronic diseases, and the effect of chronic diseases on performance
3. Understanding of the risks and benefits of exercise in older people
4. Knowledge of the effect of medications e.g. beta-blockers on exercise capacity
5. Knowledge of exercise prescription

Children and Adolescents

1. Anatomical and physiological differences of the child and adolescent, in relation to the management of injury and illness
2. Paediatric musculoskeletal injuries: epiphyseal plate injuries, traction apophysitis, common fractures and specific soft tissue injuries
3. An understanding of non-accidental injury in all its forms, to include an appreciation of child protection issues and the relevant laws.
4. Understanding of Gillick competency and the legality of treating minors.
5. Basic knowledge of metabolic diseases encountered in children and adolescents
6. Understanding and knowledge of the principles of pre participation screening in children, with particular emphasis on cardiology screens for HOCM
7. Diagnosis and treatment of exercise induced asthma in childhood.
8. Application of appropriate training workloads to the developing skeleton and metabolism
9. Identification of common eating and body perception disorders in the developing athlete, with particular reference to amenorrhoea (primary and secondary) and the female athlete triad

Skills

Women

1. Ability to advise re:
 - contraception including removal of coils etc
 - training through pregnancy
 - return to sport after pregnancy
2. Appropriately investigate athletes with menstrual problems and treat accordingly

Older people

1. Medically assess older people wanting to participate in sport: elite athletes, recreational exercisers and new exercisers for potential risk factors
2. Provide appropriate exercise prescription for the elderly athlete
3. Prescribe appropriate levels of activity in older people with chronic diseases

Children and Adolescents

1. Identification and assessment of the sick child
2. Interpretation of paediatric X-rays and scans
3. Competency in examination of the paediatric skeleton
4. Ability to take an effective adolescent psychiatric history

Experience

Women

1. Work with female athletes and teams
2. Involvement in gynaecology, antenatal, postnatal clinics in hospital or general practice setting
3. Experience of contraception prescribing e.g. in general practice +/- Family planning certificate/courses

Older athletes

1. General training in adult medical specialities e.g. respiratory medicine, cardiology
2. Experience in basic ECG reading and exercise testing (see cardiology section)

Children and Adolescents

1. Attachment to adolescent squad in a designated sport (gymnastics, swimming, diving, trampolining)
2. Child protection course
3. Clinic and A&E specific experience

MODULE 11: RESEARCH, STATISTICS AND AUDIT

Knowledge

1. Ethics of clinical research
2. Types of study design – experiments, observational, controlled, single case.
3. Principles of statistics, trial design, randomisation and techniques of data analysis
4. Epidemiology of sports injuries and health problems associated with exercise
5. Principles of conducting an audit
 - Objectives
 - Design
 - Implementation
 - Reporting of results
 - Interventions

Skills

1. To be able to read scientific and clinical and other relevant papers and reports critically
2. To be able to evaluate the evidence presented in papers, literature reviews and meta-analysis
3. To report research findings in written papers and at meetings
4. To design and implement a clinical audit
5. To incorporate research findings into clinical practice
6. To take the appropriate action arising from the clinical audit
7. To supervise a research a project
8. To demonstrate an ability to design research

Experience

1. Participating in training in research methods and statistics
2. Undertake regular 6 monthly clinical audit projects
3. Laboratory techniques relevant in Sport and Exercise Medicine
4. Analysing data by appropriate means
5. Presenting the results in a paper and at meetings, so that the research is subjected to peer review

MODULE 12: TEACHING AND PRESENTATION SKILLS

Knowledge

1. Principles of presentation construct
2. Principles of customising information presentation to groups of varying levels of medical understanding (athletes, trainers, allied health professionals, other Sport and Exercise Medicine specialists etc)
3. Familiarity with commonly used software packages for presenting information

Skills

1. To be able to present educational information to audiences in a confident and competent manner
2. To be able to effectively tailor a presentation to the level of medical understanding of a specific audience
3. To be competent with using industry standard presentation software packages

Experience

1. Regular presentation of Sport and Exercise Medicine knowledge to community groups, athletes and other medical professionals
2. Presentation (case history, literature review, research update) at Sport and Exercise Medicine conference on an annual basis: regional, national and international (preferred)
3. Attendance at formal teaching courses and workshops

MODULE 13: SPORTS MEDICINE MANAGEMENT

Knowledge

1. Principles of personal effectiveness/ time management
2. Principles of business planning and marketing strategy
3. Understanding of IT in medical practice and potential for enhancing practice efficiency
4. Human Resources Issues
 - Staff recruitment - person specification, job description, interview technique, equal opportunities
 - Staff contracts
 - Staff development, appraisal
 - Disciplinary procedures, complaints procedures
5. Principles of good communication, counselling
6. Principles of good teamwork - group dynamics, leadership techniques, conflict resolution, motivation, promotion of team identity
7. Ability to work effectively within multidisciplinary teams around athletes and exercisers - physiotherapists, sports scientists, osteopaths, chiropractors, coaches and others.
8. Principles of effective financial accounting, planning, policy development and budgeting
 - Organisation of the NHS
 - Role of health authorities
 - NHS reforms
 - Funding health care for sport and individual exercisers
 - Possibilities and limitations of care from the National Health
 - Private sports medicine services
 - Possibilities and limitations of care from the Private Sector and Voluntary Sector (St Johns, Red Cross, St Andrews)
9. Organisations within the medical profession:
 - GMC, Royal Colleges and Faculties, (JRCPTB and SAC), FSEM, PMETB, BMA
 - Specialist societies - BASEM
 - Professions allied or groups supplementary to medicine - physiotherapy, nursing, orthotists, biomechanists, sports scientists, psychologist, nutritionists
10. Clinical Governance
11. Appraisal
12. Principles of planning and running a formal meeting with emphasis on formal structure of the meeting

Skills

1. To communicate effectively – verbal, written
2. To write good medical records and reports
3. To promote activity in the general population
4. To employ and encourage methods to prevent injury in athletes
5. To contribute to professional education for:
 - medical undergraduates and postgraduates
 - other health care personnel
 - others working in sports - athletes, coaches, sports scientists
6. To plan and manage own continuing professional development
7. To participate effectively in committees
8. Ability to plan and implement a formal meeting, adhering to formal requirements of accountability

Experience

1. Preparing business plans and proposals
2. Staff recruitment process
3. Staff appraisal
4. Study annual accounts and budget
5. Fund raising
6. Health care systems for sports or individual exercisers – NHS and private
7. Various multidisciplinary teams in which Sports Physicians are involved
8. Development of services for injured and unwell athletes
9. Contribution to public health policy development aimed at increasing participation in sport and physical activity.
10. Participation in committees with experience of chairing and secretarial roles

MODULE 14: ETHICAL AND MEDICO-LEGAL ASPECTS

Knowledge

1. Relevant EU legislation and medico-legal guidelines
2. Legislation regarding patient confidentiality
3. Legislation regarding keeping of medical records
4. Requirements for patient consent
5. Guidelines for dealing with minors and other potentially vulnerable individuals
6. Strategies utilised by media and other interested parties to gain information in breach of patient confidentiality
7. Privacy legislation
8. Regulatory bodies including IOC (sporting), BMA and Defence Unions (medical)

Skills

1. Abide by legislative and medico-legal guidelines
2. Deal appropriately with minors and other potentially vulnerable individuals
3. Know when it is appropriate to have a chaperone present
4. Maintain legible and accurate medical records at all times
5. Obtain patient consent where appropriate
6. Respect patient confidentiality and resist coercion by media and other interested parties
7. Abide by privacy legislation with regard to all individuals and parties

Experience

1. Attend educational seminars relating to ethics and medico-legal obligations
2. Deal with minors and other potentially vulnerable individuals under supervised conditions
3. Observe others obtaining patient consent
4. Act as chaperone for others
5. Read information available and attend workshops on privacy legislation

MODULE 15: SELF-DIRECTED LEARNING

Knowledge

1. Objective understanding of own strengths and weaknesses in relation to Sport and Exercise Medicine training
2. Potential resources for gaining further training in area of weakness or in area of special interest
3. Procedures for obtaining prospective approval of elective activities

Skills

1. Ability to identify and use appropriate resources (e.g. mentors) for objective feedback on strengths and weaknesses
2. Ability to use information technology and medical networks to gain more information about potential elective activities
3. Ability to design and implement elective activities while complying with procedures for Sport and Exercise Medicine training

Experience

1. Any activity which is considered beneficial for the trainees Sport and Exercise Medicine training, while complying with training procedures

3

THE LEARNING PROCESS

3.1 Model of learning

The reforms of Modernising Medical Careers as well as the demands of the NHS require increased reliance on effective and focussed work-based learning. This is compounded by reduced clinical exposure and working hours. Implementation of the Foundation Programme curriculum paves the way for increased capacity to identify both learning opportunities and achievement of that learning in basic and higher specialist training.

The key characteristics of learning while practising in the clinical setting in Sport and Exercise Medicine are:

- It involves both clinical and educational considerations
- It demands both patient centred and learner centred interaction during the same clinical event with the emphasis on effective oral communication
- It requires all clinical events to be seen and treated as educational experiences, whilst also being patient-centred
- Trainees need to recognise that clinical settings are at all times a learning resource and this may be a negative or a positive experience
- While essentially carried out in the work setting, it must be complemented by opportunities for reflection at a distance

(adapted from JCHST (2005) Intercollegiate Surgical Curriculum Project)

Trainees and trainers are expected to have full knowledge of the curriculum. Most competencies are acquired over a sustained period of experience.

The majority of learning will be experiential in a variety of clinical settings. In these settings they will undertake activities both independently and directly supervised and observed by senior staff; trainees will have opportunities for concentrated practice in skills and practical procedures during their hospital placements; they will learn from peers and be supervised when not yet fully competent in skills by senior staff. This will be regularly backed up by feedback from senior staff including consultants and monitored by clinical, educational and research supervisors. Experience will be graded to the level of training and proportionate to the level of expertise. Supervision will always be given where the trainee has not yet acquired a sufficient level of competence.

Peer learning is also important with discussion amongst colleagues at all levels in the clinical placements and at regional meetings.

Formal teaching is needed for topics such as teaching skills, research methodology, information technology skills, appraisal techniques and other clinical governance methodology. In addition trainees are expected to attend courses to cover such topics. The final part of any management course is usually undertaken in the last year of the training programme.

Personal study (self-directed learning) including the reading of relevant professional journals and textbooks and use of CDs, DVDs, searching the worldwide web and use of other library resources as detailed in Appendix 1

Trainees are expected to complete evidence of reflective practice through case reports and other experiences in their training record. Other self-directed work will be planning, data collection, analysis and presentation of audit and research work such that the training record will contain evidence of academic pursuits.

Trainees will take part and lead in teaching and will be expected to develop skills to teach undergraduates, postgraduates and non-medical staff in small groups and formal lectures making personal presentations using a variety of audiovisual methods. They will be expected to present at journal clubs, and make case presentations at grand rounds or similar settings. They will be expected to undertake personal audit and research and make presentations of their findings at clinical meetings.

Off-the job education and rotations to various work places will be arranged to enable delivery of the totality of the curriculum.

The key will be regular work-based assessment by educational supervisors who will be able to assess, with the trainee, their on-going progress and whether parts of the curriculum are not being delivered within their present work place. The practice of educational supervisors is described below under supervision and feedback.

3.2 Learning experiences

The curriculum will be delivered through a variety of learning experiences. Trainees will learn from practice (work-based training); trainees will have opportunities for concentrated practice in skills and procedures where appropriate; they will learn from peers.

As already emphasised the trainee will constantly be helped to see learning opportunities in the normal course of their work and to match their progress against the curricular requirements. Trainees will be expected to commit themselves equally to progress in routine procedures as well as developing expertise in more specialised areas of their work. Any reluctance to attend to these equally will be discussed in appraisal and supervision meetings.

Educational activities offered to the trainee, which can be combined in a number of ways and in any variety of formal and informal contexts, are described below. The degree of planning will also vary according to the individual trainee and the context. Protected free study time is available.

- Analysis of care scenarios, both their own and others', using case based discussion assessment
- Analysis of in- and out-patient work
- Audit work, as a way to learn about clinical governance and risk management
- Discussion of patients'/carers' feedback
- Group discussion of typical cases in MDT meetings
- Journal clubs
- Literature reviews
- Mock exams
- Observing someone else's work
- Participation in meetings in related specialties, such as rheumatology, cardiology and T&O
- Participation in formal general professional training events offered by the Deanery or equivalent
- Participation in College and Faculty organised events

- Participation in national and international conferences
- Regional programme of lectures and sessions
- Review of clinical guidelines or protocols
- Review of patient's case notes, individual or team
- Simulated patients and/or colleagues
- Simulation Centre/Skills laboratory
- Video-recording of one's own practice
- Video-recording of someone else's practice

Whatever approach is adopted in Sport and Exercise Medicine there will not be simply a repetition of theory based presentations or what they have previously experienced. The focus will be on detailed analysis of the individual's actual work in the areas explored. Peer learning and periods of personal study are also available.

This will require small group presentation, facilitation reviewing and debriefing skills for which the supervisors and trainers will be appropriately prepared. Deanery, College and Trust support for this training is in place.

4. LEARNING OBJECTIVES

Trainees should achieve specific objectives each year relevant to the type of training programme being undertaken. In SEM a progress record has been developed allowing progress to be ascertained each year.

It is suggested that trainees should achieve specific objectives each year relevant to the type of training programme being undertaken. Progress will be ascertained each year by the regional specialty adviser working with the representatives of the postgraduate dean. This is done formally each year as part of the RITA which is organised by the deanery. At the RITA a panel including a representative of the postgraduate dean, the regional specialty adviser, academic representative and other trainers meet with and question the trainee to review the trainee's reports and progress with assessments. Recommendations are made on future learning objectives and also whether targeted or repeat training is needed. These recommendations are communicated to the trainee and future educational and academic supervisors and mentors. Approximately 18 months prior to the estimated date of completion of training the RITA takes the form of a penultimate year assessment (PYA) at which an external representative of the SAC will also attend the panel that will make recommendations on objectives to be achieved during the rest of the training programme depending on progress in meeting the curriculum requirements.

5. SUPERVISION AND FEEDBACK

All training in post-graduate medicine should be conducted in institutions with appropriate standards of clinical governance and that meet the relevant Health and Safety standards for clinical areas. Training placements must also comply with the European Working Time Directive for trainee doctors.

Trainees must work with a level of clinical supervision commensurate with their clinical experience and level of competence. This is the responsibility of the relevant clinical supervisor after discussion with the trainee's Educational Supervisor and the designated clinical governance lead. In keeping with the principles of Good Medical Practice, trainees should know that they must limit their clinical practice to within their level of clinical competence and seek help and support without hesitation.

5.1 Supervision

The educational supervisor will meet regularly and formally with the trainee to discuss progress and to feed back on assessment. This will ensure the trainee understands what development is required. An important component of this will be the completion of work-based assessments. Debriefing and feedback on practice are seen as one of the most important components of this curriculum. Both trainers/supervisors and trainees alike will be expected to organise and allocate sufficient time to this and use feedback effectively to increase learning. Different styles and models of debriefing will be used, according to the needs of the trainee and levels of clinical risk and will normally range from prescriptive to facilitative. Due attention will be given to honesty, accuracy, encouragement of reflection and analysis within a supporting professional relationship. Resulting action planning, repetition of necessary experience and tailored support will be organised. Trainees will be encouraged to document conclusions from feedback discussions.

Educational quality will be monitored through feedback from trainees, assessments results. As set out above, SEM is currently developing a comprehensive assessment structure which will ensure comprehensive evidence collection for the whole syllabus and space for clinicians' expert judgement to ensure that individual competences and overall competency are achieved.

5.1.1 Role of the educational supervisor

The educational supervisor, when meeting with the trainee, will discuss issues of clinical governance, risk management and the report of any untoward clinical incidents involving the trainee. The educational supervisor is 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. This would not detract from the statutory duty of the trust to deliver effective clinical governance through its management systems. Sport and Exercise Medicine organises specialty specific induction over and above the Trust induction procedures. This includes explanations of how SEM teams work, study leave, annual leave arrangements, on-call rotas, educational opportunities, documentation and agreements. Special attention will be given to the nature of work-based learning and the changes in PGME, so that everyone is clear about their roles and responsibilities. Supervisors and the programme director will take this opportunity to establish good working relationships with the trainees so that accurate diagnosis of their needs can be carried out. Degrees of supervision are then ascertained in the differing settings in which the trainee will work. If the documentation which the trainee brings to the programme is not deemed to provide up-to-date or sufficient evidence of achievement and progress, initial assessment of level will be carried out so that all reasonable steps are taken to negotiate a useful Personal Learning Plan support the learning from the outset. The Deanery appointed training Programme Director will oversee the rotational programmes.

The key principles on which the educational supervision and RITA processes are developed are:

- 1 Early identification of difficulty and particular need
- 2 Regular monitoring and feedback to avoid surprises
- 3 Appropriate evidence of progress supports all decision taken

Appraisal and review meetings will take place regularly so that this can be done, in the clear understanding that the trainee's role is to drive their own learning and progress, supported by the trainer/supervisor, College tutor and programme director.

In this way specific support can be put in place in time for the trainee to actually benefit before the meeting of the annual RITA panel and opportunities for improvement are maximised. On review of the evidence presented by the trainee at the RITA panel it may be decided that targeted support is necessary. This is then put in place in close collaboration with the Postgraduate Dean and the trainee will be supported by specially trained supervisors

The work of both clinical and educational supervisors is clearly described and regular liaison takes place between these two senior consultants to ensure that evidence of progress is both valid and reliable. The necessity for this close collaboration is increased with the constraints of the European Working Time Directive resulting in fewer opportunities for direct observation and feedback from the supervising consultant. The signing off of achievement of competence is carried out by both and the educational supervisor takes care to oversee the whole of the trainee's progress, working closely with the training programme director and clinical tutor of the trust.

Ongoing curriculum development will increase the pool of supervisors taken from other healthcare professions as well as increasing multi-disciplinary learning opportunities for the trainees. Deaneries and Colleges offer professional development opportunities to ensure that the educational skill base, with particular emphasis on assessment, increases as part of this curriculum development.

5.1.2 Trainees in difficulty

The educational supervisor and programme director are responsible for identifying trainees in difficulty either because of lack of progress in training or because of personal issues such as illness, emotional strain etc. The programme director is responsible for establishing a system where each trainee's progress is monitored regularly and satisfactorily and that trainees know who to contact should they be having difficulty. If necessary the programme director will use the expertise within the deanery for managing such trainees.

5.1.3 Responsibilities of the trainee

The person ultimately responsible for an individual's training in SEM is the trainee him/herself. Although support and supervision will be available, the trainee should feel that they own their training programme. The trainee has an important responsibility to maintain a comprehensive training record as detailed below.

The responsibilities of the trainee include:

- Awareness of the requirements for training as detailed in this curriculum and use of learning opportunities available both within and outside their particular training rotation.
- Awareness of who their educational supervisor is for each post and their role as outlined above. Making arrangements to meet with their educational supervisor regularly and at least 3 monthly for appraisal and assessment and to complete an educational/learning plan.
- Awareness of who their academic mentor is and make arrangements to meet them at least twice yearly
- Attend deanery, Trust and unit induction programmes as arranged
- To maintain an up-to-date training record including a portfolio or reflective case reports and programmes of regional and national meetings attended, details of teaching, audit and research presentations, copies of abstracts and articles or details of book chapters they have written or contributed to, supervision reports and other certificates or documentation pertaining to their training. The trainee should provide all the necessary documentation for the RITA which they should be prepared for and attend.
- To grasp the opportunities that are available to them in order to enhance their training.
- To attend local and regional training meetings, and ideally one national or international meeting each year.
- To know whom to contact if problems arise: typically their educational supervisor followed by their regional speciality adviser, programme director or other mentor as arranged by the deanery.

5.1.4 Supervision of practice and safety of patient and doctor

The educational supervisor having met with the trainee to establish previous experience and current competence will set learning objectives. Following assessment of the current level of competence of the trainee and taking into account the learning objectives the supervisor will decide what activities it is appropriate for the trainee to undertake unsupervised or with graded levels of supervision. Progress will be observed and assessed by all supervisors (educational, clinical and academic) such that appropriate decisions can be made to allow practice to be less formally supervised.

Each deanery and training setting will provide induction including the provision of appropriate written or electronic information so that trainees are aware of the policy within the work place, safety issues and support systems. Programme directors and mentors of trainees will check with trainees whether they have been exposed to situations of unsafe clinical practice.

The educational supervisor will discuss with the trainee issues of clinical governance, risk management and the report of any untoward clinical incidents involving the trainee. If the clinical director of the service within which the trainee is working has any concerns about the performance of the trainee, or there are issues of doctor or patient safety, these will be discussed with the educational supervisor. This does not detract from the statutory duty of the employing Trust to deliver effective clinical governance through its management systems.

5.2 Assessment strategy

The domains of Good Medical Practice will be assessed using both workplace-based assessments and examination of knowledge and clinical skills, which will sample across the domains of the curriculum i.e. knowledge, skills and attitudes. The assessments will be supported by structured feedback for trainees within the training programme of SEM. Assessment tools will be both formative and summative and will be selected on the basis of their fitness for purpose.

It is likely that the workplace-based assessment tools will include miniCEX (clinical examination exercise), DOPS (direct observation of procedural skills) and MSF (multi-source feedback). The Federation of the Royal Colleges of Physicians has piloted these methods and has demonstrated their validity and reliability.

An assessment blueprint will be developed which will map the assessment methods on to the curriculum in a systematic way. The blueprint will ensure that there is appropriate sampling across the curriculum. It is expected the blueprinting exercise will have been started by September 2006.

The SAC will be responsible for the blueprinting exercise. However in general terms the SAC envisages that all trainees will be assessed regularly, with the assessments being recorded by the Record of in Training Assessment (RITA) process defined in the Guide to Specialist Registrar Training (February 1998) sections 11 and 12. Assessment will be structured around the competence-based curriculum that sets out the subject matter, knowledge, skills and experience required of trainees for ST in SEM.

Assessments are designed to assist educational progress and fulfil the following purposes;

- To inform career selection and choice
- To confirm suitability of choice at an early stage of the training programme
- To demonstrate readiness to progress to the next stage of training, having met the required standard
- To provide feedback to the trainee about progress and learning needs

- To support trainees to progress at their own pace by measuring progress in achieving competencies for chosen career path
- To identify trainees who should change direction or leave medicine
- To enable the trainee to collect all necessary evidence for revalidation
- To assure the public that the trainee is ready for unsupervised practice
- To provide evidence for the award of a CCT
- To drive learning / CPD
- To gain membership or fellowship of relevant associations or organisations

Assessment will be structured to examine performance. A variety of assessment methods will be used to cover all of the areas of "Good Medical Practice". Such methods will include formative and summative assessment. The particular assessment methods employed will vary depending on which aspect of training is being assessed.

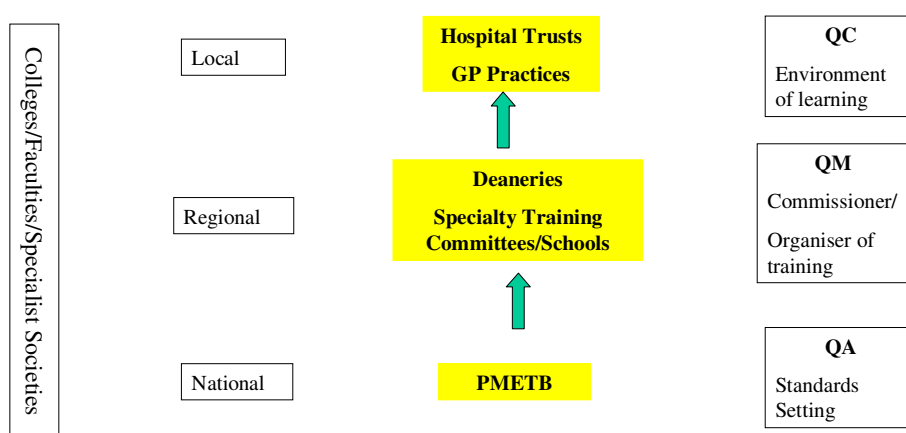
Examples of assessment methods and application to aspect of training, are outlined in the table below

To test		Methods
Knowledge		<ul style="list-style-type: none"> • Computer-based assessment • Extended matching questions • Examination/written test/MCQs • Essays • Short answers
Skills:	Diagnostic and management skills	<ul style="list-style-type: none"> • As above • Direct observation e.g. MiniCEX
	Practical procedures	<ul style="list-style-type: none"> • Observed practice against established criteria (DOPS) • OSCE • Simulation - to be used where available and where procedures involve risk to patients
	History taking, examination, investigations and patient management	<ul style="list-style-type: none"> • Case notes review (CbD) • Multi source feedback • Clinical review • Grade cases • Observed ward rounds and clinics e.g. MiniCEX
Experience/attitudes:		<ul style="list-style-type: none"> • Informed by the opinions of other professionals (multisource feedback) • Direct observation/mini CEX • Videoing consultations and reflection

6. CURRICULUM IMPLEMENTATION

Deaneries are responsible for quality management, PMETB will quality assure the deaneries and educational providers are responsible for local quality control, to be managed by the deaneries. The role of the Colleges in quality management remains important and will be delivered in partnership with the deaneries. The College role is one of quality review of deanery processes and this will take place within the SACs on a regular basis.

The Organisation and Quality Assurance of PG Training



7. CURRICULUM REVIEW AND UPDATING

Curriculum review will be informed by a number of different processes. For instance the SAC will be able to use information gathered from specialty heads, specialty deans and the National Health Service. It will have available to it results of the trainee survey, which will include questions pertaining to their specialty. Interaction with the NHS will be particularly important to understand the performance of specialists within the NHS and feedback will be required as to the continuing need for that specialty as defined by the curriculum. It is likely that the NHS will have a view 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.

8. EQUALITY AND DIVERSITY

In the exercise of these powers and responsibilities, the Royal Colleges of Physicians will comply, and ensure compliance, with the requirements of relevant legislation, such as the:

Race Relations (Amendment) Act 2000
Disability Discrimination Act 1995 (Amendment) 2004 and Special Educational
Needs and Disabilities Act 2001
The Disability Discrimination Act 1995 (amendment) (further and higher education)
Regulations 2006
Data Protection Acts 1984 and 1998
Age Discrimination Act October 2006

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.

Deanery quality assurance will ensure that each training programme complies with the equality and diversity standards in postgraduate medical training as set by PMETB.

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
- Ensuring trainees have an appropriate, confidential and supportive route to report examples of inappropriate behaviour of a discriminatory nature
- 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 in training, with a disability.

Statutory responsibilities

The Royal Colleges of Physicians will comply, and ensure compliance, with the requirements of legislation, such as the:

Human Rights Act 1998
Freedom of Information Act 2001
Data Protection Acts 1984 and 1998

Appendix 1 – References and reading

Journals

1. American Journal of Sports Medicine
2. The British Journal of Sports Medicine
3. The Clinical Journal of Sport Medicine
4. Clinics in Sports Medicine
5. Medicine and Science in Sport and Exercise
6. Physician and Sportsmedicine Online
7. Sports Medicine
8. Sports Medicine and Arthroscopy Review

Books

1. Primary Care Sports Medicine, by McKeag and Hough, Brown & Benchmark, ISBN 0-697-14841-6
2. Clinical Sports Nutrition, by Burke and Deakin, McGraw-Hill, ISBN 0-074-70828-7
3. Functional Rehabilitation of Sports and Musculoskeletal Injuries, from the Rehabilitation Institute of Chicago and Aspen Publication, ISBN 0-8342-0612-9. (2 copies; one on short-loan and one on regular loan).
4. Orthopaedic Sports Medicine, Volumes 1-3, by DeLee and Drez, Saunders Publication, ISBN 0-7216-5602-1.
5. Last's Anatomy: Regional and Applied, 10th Edition, edited by Sinnatamby, Saunders, ISBN 0-443-05611-0
6. Human Tendons, by Józsa and Kannus, Human Kinetics, ISBN 0-87322-484-1.
7. Sports Physiotherapy: Applied Science and Practice, edited by Zuluaga et al, Churchill Livingstone, ISBN 0-443-04804-5
8. The Spine in Sports, by Watkins, Mosby Publication, ISBN 0-8016-7502-2.
9. ACSM's Essentials of Sports Medicine, by Sallis and Massimino, Mosby Publication, ISBN 0-8151-0157-0.
10. Controversies in Orthopaedic Sports Medicine, edited by Chan et al, Williams and Wilkins, ISBN 962-356-025-7
11. Sports Injury Assessment and Rehabilitation, by Reid, Churchill Livingstone, ISBN 0-443-08662-1
12. Medical Problems in Athletes, by Fields and Fricker, Blackwell Science, ISBN 0-86542-480-2.
13. Isokinetics, by Dvir, Churchill Livingstone, ISBN 0-443-04794-4.
14. Clinical Sports Medicine, Revised 2nd Edition, by Brukner and Khan, McGraw Hill, ISBN 0-074-71108-3.
15. Science and Medicine in Sport, 2nd edition, edited by Bloomfield, Fricker and Fitch, Blackwell Science, ISBN 0-86793-321-6.
16. Exercise for Prevention and Treatment of Illness, by Goldberg and Elliot, F A Davis Publication, ISBN 0-8036-4163-X.
17. Sports Medicine Secrets, Second Edition, by Mellion, Hanley and Belfus, ISBN 1-56053-380-0.
18. Medical and Orthopaedic Issues of Active and Athletic Women, by Agostini, Hanley and Belfus/Mosby, ISBN 1-56053-019-7.
19. Essentials of immediate medical care, by J. Eaton, 2nd edition, Churchill Livingstone. ISBN 0-443-05345-6.

20. Ethics, Injuries and the Law in Sports Medicine, by E. Grayson, 1999. Butterworth & Heinemann (editors). ISBN 0-7506-15761.
21. Antioxidants and exercise, by Jan Karlsson. 1996. Human Kinetics. ISBN 0-87322-896-0.
22. Physiology of sport and exercise, by J. H. Wilmore and D. L. Costill, 2nd edition, 1999. Human kinetics. ISBN 0-73600-084-4.
23. Exercise metabolism, edited by M. Hargreaves (1995). Human kinetics. ISBN 0-87322-453-1
24. Biochemistry of exercise and training, by Maughan, Gleeson and Greenhaff (1997). Oxford University Press. ISBN 0-19-262741-4.
25. Myofascial Pain and Dysfunction: The Trigger Point Manual Volume 1 - The Upper Extremities, Travell, J.G. & Simons, D.G. Williams & Wilkins 1983 ISBN 0-683-08366-X
26. Myofascial Pain and Dysfunction: The Trigger Point Manual Volume 2 - The Lower Extremities, Travell, J.G. & Simons, D.G. Williams & Wilkins, 1992 ISBN 0-683-08367-8
27. Rheumatology Klippel, J.H. & Dieppe, P.A., Mosby Year Book, 1994 ISBN 0-397-44731-0
28. Musculoskeletal and Sports Injuries, Corrigan, B. & Maitland, G., 1994 Butterworth-Heinemann ISBN 0-7506-1485-4
29. The Athletes Shoulder, Andrews, J.R. Churchill Livingstone 1994, ISBN 0-443-08847-0
30. The Upper Extremities in Sports Medicine, Nicholas, J.A. & Hershman, E.B., Mosby, 1990 ISBN 0-8016-3943-3
31. The Lower Extremity & Spine in Sports Medicine Volume 2 & 3, Nicholas, J.A. & Hershman, E.B., Mosby 1995, ISBN 0-8151-6391-6
32. Apley's Concise System of Orthopaedics and Fractures, 3rd Edition, Eds - Solomon, L., Warwick, D.J. & Nayagam S. Oxford University Press, 2005 ISBN13: 978-0-340-80984-6; ISBN10: 0-340-80984-1
33. Stress Fractures , Brukner, P.D., Mathieson, G. & Bennell, K. Blackwell Scientific, 1999
34. Atlas of Imaging in Sports Medicine, Anderson, I., Read, J. & Steinweg, J., McGraw-Hill 1997 ISBN 0-07-470497-4
35. Women and Exercise: Physiology and Sports Medicine 2nd Edition, Shangold, M.M. & Mirkin, G. F.A. Davis, 1994, ISBN 0-8036-7817-7
36. Applied Anatomy and Biomechanics in Sport, Bloomfield, J., Ackland, T.R., & Elliott, B.C., Blackwell Scientific Publications 1994
37. Sports Medicine and Rehabilitation: A Sport Specific Approach, Buschbacher, R.M. & Braddon, R.L. Hanley & Belfus, 1994, ISBN 1-56053-133-9
38. Action Atlas of Mountain Medicine, Valloton Dubas, Mosby. 1991
39. Diving and Subaquatic Medicine (3rd Ed), Edmonds, C., Lowry, C. & Pennefather, J., Butterworth-Heinemann, 1992, ISBN 0-7506-0259-7

Appendix 2 - List of all those involved in the preparation of this curriculum

Attendees: March 12th 2003 Sport and Exercise and Medicine Forum

Rt Hon Richard Caborn - Minister for Sport
Mr Richard Callicott - UK Sport
Sir Rodney Walker - UK Sport
Mr John Aldridge - British Gymnastics
Mr Mike Allen - Leicester Hospitals
Mr Kenneth Allen - Post Grad. Med. Education & Training Standards Board
Prof Jim Allen -University of Ulster at Jordanstown
Dr Mark Batt – QMC/Nottingham University
Dr Philip Bell -BUPA
Dr Anita Biswas -BPA
Dr Richard Budgett - BOMC
Dr Ros Carbon -EIS
Dr Bryan English -UKADIS/UK Athletics
Mr Geoff Graham - University of Wales, Cardiff
Miss Karen Hambly -UK Sport
Mr Peter Hamlyn - London Hospital University
Ms Carol Healey - DoH Sport and Physical Activity Board
Professor Michael Hobsley -Institute of Sports Medicine
Mr Alan Hodson -The Football Association
Dr David Hughes -Australasian College of Sports Physicans
Dr Simon Kemp -Rugby Football Union
Dr John Lloyd-Parry - BASEM
Professor Donald Macleod - IABSEM
Dr Graeme Maw -British Triathlon
Ms Liz Mendl - SIS
Mr Simon Morys - DCMS/DOH
Mrs Liz Nicholl - UK Sport
Ms Catriona O'Shea - Sport Scotland
Mr Joe Patton - UK Sport
Dr Lisa Phillips - Rugby Football League
Mrs Jill Poots - Sports Council NI
Dr Malcolm Read - UKADIS
Professor Christer Rolf - Sheffield University
Ms Heather-Jane Sears - NSMI
Miss Naomi Siddall - UK Sport

Mr Ronnie Smyth -SINI
Mr Panos Thomas - London Royal University
Dr Simon Till - BASEM
Mr Mark Timms - DfES
Dr Mike Turner - LTA/Jockey Club
Professor Angus Wallace - NSMI
Mr Jonathan Webb - Bristol University
Dr Nick Webborn - NSMI
Mr Simon White - DCMS
Mrs Francesca Wood - NSMI