NHS

Sport and Exercise Medicine

A Fresh Approach

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This document has been produced as part of a programme to promote Sport and Exercise Medicine in the NHS which is being led by NHS North West.

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The Faculty of Sport and Exercise Medicine (UK)

BASEM British Association of Sport & Exercise Medicine

BJSM The Journal of Sport and Exercise Medicine

NHS North West

"The Prime Minister is keen for Sport and Exercise Medicine to make an important contribution to our country's health and wellbeing, particularly given the Olympic bid commitment to establish the medical speciality and its potential to improve significantly the lives of those with chronic long-term conditions."

10 Downing Street

"Sport and Exercise Medicine has progressed a long way since I competed as an athlete. I am delighted by this exciting new medical specialty that will provide care and benefits throughout the NHS"

Sebastian Coe KBE, Chair, LOCOG

"A Fresh Approach" provides an important step in the development of new clinical services within the NHS. It demonstrates the urgent requirement for Sport and Exercise Medicine to be commissioned across the NHS. This will help improve patient care for non-surgical orthopaedic conditions, assist increased physical activity levels, support grassroots and elite sport and importantly introduce specialist prescribed physical activity in the treatment of chronic diseases.

Mike Farrar, Chief Executive,
NHS Confederation

"The Faculty of Sport and Exercise Medicine is committed to leading the specialty of Sport & Exercise Medicine. The development of preventative and therapeutic Sport and Exercise Medicine services in the NHS will benefit the general population and our patients"

Mark Batt, President,
The Faculty of Sport and Exercise Medicine

This demonstrates the urgent requirement for Sport and Exercise Medicine to be commissioned across the NHS

Preface

This document introduces the specialty of Sport and Exercise Medicine (SEM) to the NHS. It presents the expected benefits that SEM can bring to the NHS. It makes 5 broad points:

1. Physical activity is a proven way of preventing expensive and debilitating diseases.
2. People suffering from chronic diseases can significantly improve their recovery and prevent co-morbidity if they exercise as part of their treatment.
3. Musculoskeletal (MSK) injuries cost the NHS huge amounts in unnecessary GP and orthopaedic time. They cause 50% of all sickness absence in the NHS alone – a massive 5 million days each year.
4. It can be challenging to get people to exercise, particularly if they are unfit (see point 1) or ill (see point 2). As a result, the NHS is missing the substantial health and financial benefits that exercise could bring in both prevention and treatment.
5. The specialty of Sport and Exercise Medicine (SEM) can help.

If the practical problems of changing the behaviour of the population could be addressed, the benefits to the NHS could be very significant:

- 30% to 50% reductions of risk in the development of common chronic conditions, including cancer, ischaemic heart disease, obesity and diabetes, dementia and depression.
- Significant improvements in the efficacy of treatment of those same chronic conditions.
- Improved outcomes, patient satisfaction and reduced costs (many fewer GP and orthopaedic presentations) for musculoskeletal injuries.

The remainder of this section summarises the key points that are brought out in the rest of the paper.

Physical activity in the prevention of disease

Section 1 of this document deals with the role of physical activity in the prevention of disease and other conditions.

While the sedentary develop serious and expensive illness over time (stroke, cancer, ischaemic heart disease, obesity and diabetes, dementia and depression) regular exercisers are 30-50% less likely to be affected by these conditions.

Other key points:

- On average, an inactive person spends 38% more days in hospital than an active person, and utilises 5.5% more GP visits, 13% more specialist services and 12% more nurse visits than an active individual.
- Physical inactivity is an endemic social problem. Only 39% of men and 29% of women in the UK meet minimum physical activity recommendations when measured subjectively and about 5% when measured objectively. It is recognised that this is a complex societal issue, not just a medical problem.
- There is compelling evidence that regular physical activity is effective in the primary prevention of chronic disease and in the prevention of early death.

Disease state	Risk reduction
Ischaemic heart disease	40%
Stroke	27%
Colon cancer	25%
Breast cancer	24%
Type 2 diabetes	30%
Hypertension	50%

The difficulty of getting patients to adhere to long term exercise

The key issue is getting the population to exercise, either as a preventative measure (wellness) or as a part of the treatment of chronic disease or musculoskeletal injury. The challenge is to persuade the sedentary, unfit and the unwell to change their behaviour. This behavioural change requires an investment of time and expertise to provide advice, training, encouragement and selective long-term monitoring.

Physical activity in the treatment of disease

Section 2 of this document deals with the effect of exercise on the treatment of chronic disease. The list of diseases effectively managed with physical activity continues to grow. There is Level 1 evidence for the effectiveness of physical activity in the management of most chronic disease areas and consequently exercise is now included in multiple specialist treatment guidelines.

Chronic disease	Effect of exercise therapy
Ischaemic heart disease	35-40% reduction in risk of event
COPD	Improvement in aerobic fitness, quality of life, symptoms of dyspnoea, CV risk factors
Breast cancer	50% reduction RR of breast cancer death
Bowel cancer	50% reduction in bowel cancer death Improvement of tolerance of cancer treatment
Cerebrovascular disease	Improvement of aerobic capacity, sensorimotor function and CV risk factors
Diabetes	42% reduction in diabetes related mortality 32% reduction in diabetes related complications
Impaired glucose tolerance	42% reduction in risk of developing diabetes
Hypertension	Reduce systolic BP by 7.4mmHg and diastolic BP by 5.8mmHg
Depression/anxiety disorders	Effect as good as standard pharmacological treatments for moderate depression
Rheumatoid arthritis	Improved aerobic fitness, disease activity, function and QoL
Osteoarthritis	Improved aerobic capacity, reduce fatigue and pain. Improve muscle strength and function
Osteoporosis	Reduction in risk of falls. Maintenance of BMD in men and postmenopausal women
Pregnancy	Reduce risk of pregnancy induced diabetes

RR=relative risk, QoL=quality of life, BP=blood pressure, CV=cardiovascular, BMD=bone mineral density

In primary care, GPs are likely to be asked to screen for physical inactivity using questionnaires and will then be asked to identify high risk patients. There is currently no routine education or support for GPs, or other members of the primary care team, on physical activity prescription for those identified by this screening procedure as high risk.

Musculoskeletal health

Section 3 of this document deals with the treatment of musculoskeletal (MSK) health in both primary and secondary care. MSK disorders affect almost every individual at some stage of their life making them a common reason for visiting a GP: accounting for up to 30% of all primary care consultations.

The two main issues are:

1. Orthopaedic resources are often inefficiently used in assessing MSK disorder. Up to 80% of cases seen in orthopaedic outpatients departments do not convert to surgery. These patients typically then re-present to their GPs. This is not time or cost-effective for patients or healthcare professionals.
2. MSK disorders are often best treated by a broad, multidisciplinary group of practitioners including specialist musculoskeletal physicians, physiotherapists, podiatrists, dieticians and psychologists. Leadership of this group is required for effective coordination and management.

Workplace wellness

Section 4 of this document deals with improving workplace wellness. There is a strong link between MSK disorders and workplace wellness: half of NHS absence due to sickness is as the result of an MSK condition. With a total of 10.3 million days lost to sickness in the NHS alone each year, this equates to over five million days (or over 22,000 full time equivalent jobs) lost as the result of MSK injuries, a significant proportion of which might have been prevented or treated more rapidly.

Healthcare providers who are physically active will not only gain personal health benefits but they are more likely to promote physical activity to their patients.

Sport and Exercise Medicine education and research

Sections 5 and 6 explain the role of Sport and Exercise Medicine specialists in education of healthcare professionals and research to improve patient care and services. Sport and Exercise Medicine specialists working in the NHS will be best placed to improve knowledge and clinical care in these essential areas.

The role of the Sport and Exercise Medicine (SEM) Specialist

Sections 7 and 8 deal with the role and benefits of the Sport and Exercise Medicine specialist working in the NHS and adaptability of service models to local needs. As a response to the growing need to redress the global physical inactivity pandemic, the specialty of SEM has been developed. The UK follows many other countries in creating a specialty of Sport and Exercise Medicine with entries onto the specialist register starting in 2005. SEM specialists are now available to the NHS and should be used to help create a fundamental change in healthcare, where wellness and primary prevention are paramount.

SEM specialists are trained in chronic disease management, the prescription of exercise to those patients with co-morbidity, the diagnosis and management of musculoskeletal disorders and the education and training of the multidisciplinary team. SEM services are flexible and can be delivered in primary, secondary and intermediate/integrated care settings as well as in public health.

In primary care, SEM physicians can:

- Work with primary care teams and public health to support effective physical activity prescription, including providing education for the primary care team so that consistent, evidence based and effective physical activity interventions are provided.
- Provide expertise for patients requiring specialist input; for example those identified as 'high risk' due to medical conditions and co-morbidity and those requiring more intense behavioural interventions.
- Provide locally based musculoskeletal services, bringing a range of additional skills such as leadership, triage, rapid access to ultrasound scans, evidence based injection therapies, specialised back pain services and chronic pain services etc.

In secondary care, SEM physicians can;

- Restructure and modernise existing rehabilitation services so they are patient-centred, evidence-based and inclusive of all chronic disease areas effectively treated by exercise.
- Establish multidisciplinary teams to provide a single point of referral for patients requiring specialist help to overcome their medical, social or cultural barriers to exercise.
- Establish SEM led clinics to work alongside existing orthopaedic, physiotherapy and emergency department services in identifying, treating and rehabilitating acute and chronic MSK disorders which do not require surgery.

It is also essential that the NHS works with the health and fitness industry. Links in the past have not worked well, leading to exclusion of patients for a number of reasons, including co-morbidity, geography and expense. This can have the counterproductive effect of reinforcing barriers to physical activity. SEM physicians will work with the fitness industry both nationally and locally to improve patient pathways.

Sport and Exercise Medicine - A Fresh Approach

Contents

Introduction

The costs of providing medical care for the consequences of the UK's physical inactivity endemic are not sustainable. (Foresight report-2007). Non communicable chronic disease causes 79% of deaths in developed countries (World Health report 2002). In the future the NHS will need to invest proportionately in physical activity interventions for the prevention and treatment of diseases known to be substantially affected by sedentary lifestyles. (London Legacy, Let's Get Moving, Change4life, Be Active, Be Healthy). Primary prevention is a core principle of the 2011 White Paper - 'Liberating the NHS'.

As a response to the growing need to readdress the physical inactivity epidemic and our increasingly sedentary nation, the specialty of Sport and Exercise Medicine (SEM) was introduced in 2005: SEM physicians are now available to the NHS.

This NHS information document introduces the specialty to NHS commissioners. It starts by outlining the problems faced by the NHS in the prevention and treatment of disease, in musculoskeletal health, in workplace wellness, education and research. (Sections 1-6) The document then explains the added value of commissioning SEM physicians in order to tackle these problems. (Section 7) Implementation and planning are then discussed. (Section 8) References for all of the sections and more detailed analysis of points made can be found in the appendices. (Section 9)

The epidemic of physical inactivity is a societal issue and should be addressed throughout primary and secondary care as well as through public and social health. The NHS will also need to utilise efficiently the third and private sectors. SEM physicians are well placed to contribute, coordinate and sustain these efforts.

The London 2012 Olympic and Paralympic Games will refocus the nation and media on sport and exercise. We have a unique opportunity to harness the energy and enthusiasm of the Games to help create a more active and healthy population.

> *"Being active is no longer an option… it is essential if we are to live long and healthy lives into old age"*
>
> Chief Medical Officer, 2005

1. Physical activity in the prevention of chronic disease

Key points

- A dose-response relationship exists between physical activity and all-cause mortality and the greatest benefits to the health are seen with those moving away from a sedentary lifestyle; the combined benefits of physical activity on both mental and physical health easily surpass the effectiveness of any drugs or other medical treatment. People who are physically active reduce their risk of premature death by 20-30%. (See appendix 1.1)
- Physical inactivity is endemic. Only 39% of men and 29% of women in the UK meet minimum physical activity recommendations, when measured subjectively and about 5% when measured objectively. (See appendix 1.1)
- There is compelling evidence that regular physical activity is effective in the primary prevention of chronic disease and in the prevention of early death. Physical activity is the most prevalent modifiable risk factor for chronic disease. (See appendix 1.3)
- The current direct cost of physical inactivity to a Primary Care Trust in terms of burden of disease is estimated at £5 million per year. The direct and indirect costs of physical inactivity in England have been estimated at £8.2 billion per year. (See appendix 1.5)
- SEM specialists are ideally placed to support primary care and public health in the delivery of effective, evidence-based, sustainable, patient-centred physical activity interventions.

The health benefits of physical activity are seen irrespective of age and social-economic group or cultural origin. There are also clear indirect benefits of physical activity to the wider economy. People who are physically active are more productive than those who are not. They take less time off work, consume fewer health care resources and are happier. (See appendix 1.1 and 4.1) The evidence that physical activity prevents major chronic disease is indisputable.

Table of major chronic disease states effectively prevented by physical activity
(See appendix 1.2)

Disease state	Risk reduction
Ischaemic heart disease	40%
Stroke	27%
Colon cancer	25%
Breast cancer	24%
Type 2 diabetes	30%
Hypertension	50%

Physical activity prescription for the prevention of disease currently falls to primary care. Physical activity interventions have had limited measurable success in this setting. The literature is clear that long-term adherence is best achieved by a multidisciplinary approach with a focus on self-efficacy and long-term behavioural change. The more intense the intervention, the better the long term outcomes. (See Appendix 2.2) Intense physical activity interventions are not currently available in primary care. Pragmatic clinical trials to test long-term cost-effectiveness of intensive physical activity interventions in this setting are not available. (See appendix 1.2)

Despite this, NHS vascular health checks are currently being piloted. Primary care is expected to 'screen' for physical inactivity using physical activity questionnaires (GPPAQ) and then asked to identify 'high risk' patients using physical activity readiness questionnaires. GPs will be then be required to prescribe exercise for these 'high risk' patients. There is currently no routine education or support for GPs on physical activity prescription for those identified by this screening procedure as 'high risk'. (See appendix 1.4) Ancillary staff such as practice nurses and health trainers (See appendix 1.2) can educate patients about physical activity but they require education and support particularly when faced with patients with complex medical and musculoskeletal conditions and other barriers to exercise.

Links with the fitness industry are often suboptimal leading to exclusion of patients for a number of reasons, including co-morbidity, geography, and expense. This can have the counterproductive effect of re-enforcing barriers to physical activity. (See appendix 2.3) While this is currently being addressed at a national level, local relationships with key providers are often absent leading to inconsistent patient pathways.

2. Exercise in the treatment of chronic disease

Key points

- Effective physical activity prescription for all those with chronic disease remains one of the greatest challenges of modern medicine.
- There is compelling evidence that regular physical activity and increased cardiorespiratory fitness is an effective treatment adjunct for most chronic diseases and prevents the development of co-morbidity.
- Barriers to exercise are compounded by illness.
- Current provision within the NHS for physical activity prescription in chronic disease is inconsistent, disease specific and incomplete.

Exercise needs to be promoted by all healthcare providers. Exercise rehabilitation and referral schemes need restructuring and modernising in order to provide a patient-centred service which can address the complex medical, social and cultural barriers to long-term behavioural change.

The list of diseases effectively treated with exercise continues to grow. There is Level 1 evidence for the effectiveness of physical activity in most chronic disease areas and consequently exercise is now included in multiple specialist treatment guidelines. (See appendix 2.1) There are emerging, plausible biological mechanisms to explain why physical activity has such a profound treatment effect. (See appendix 2.4)

Chronic disease states effectively treated with exercise (See appendix 2.1)

Chronic disease	Effect of exercise therapy
Ischaemic heart disease	35-40% reduction in risk of event
COPD	Improvement in aerobic fitness, quality of life, symptoms of dyspnoea, CV risk factors
Breast cancer	50% reduction RR of breast cancer death
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Cerebrovascular disease	Improvement of aerobic capacity, sensorimotor function and CV risk factors
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Pregnancy	Reduce risk of pregnancy induced diabetes

RR=relative risk, QoL=quality of life, BP=blood pressure, CV=cardiovascular, BMD=bone mineral density

Whilst there has already been much important work done in this area, long-term exercise adherence for those with chronic disease remains low. Compliance can be improved by specific behavioural interventions, focusing on self-efficacy and sensitivity to the complex and individual social, medical and cultural barriers which preclude people with chronic disease from long-term physical activity. (See appendix 2.2)

Those with chronic disease often have additional barriers to exercise such as pain, fear of exercise, confidence issues and physical difficulties in achieving therapeutic physical activity levels. (See appendix 2.2)

Current physical activity rehabilitation schemes for those with chronic disease are fragmented and incomplete (See appendix 2.3). They are often inflexible and lack the resources to address complex medical, social and psychological barriers. Continued pathways after these schemes are often suboptimal leading to poor long-term adherence. (See appendix 2.3)

Many people with serious chronic disease such as cancer, dementia, depression, osteoarthritis and obesity still have no access to physical activity interventions and are thus being denied a treatment, which could dramatically improve long-term outcomes.

3. Musculoskeletal health

Key points

- Musculoskeletal (MSK) disorders are a major cause of morbidity often having a substantial effect on quality of life.(See appendix 3.2)
- Early intervention and rehabilitation is key to prevent time lost from the workplace and physical activity.
- Key services such as chronic pain management services and non-surgical osteoarthritis services are sporadic and under-resourced in the NHS leading to excessive long term morbidity.
- SEM Consultants are skilled in the management of MSK conditions and are able to co-ordinate care in the multidisciplinary team in both the primary and secondary care setting

MSK disorders affect almost every individual at some stage of their life making them a common reason for repeat consultations with a GP, accounting for up to 30% of all primary care consultations. (See appendix 3.1)

Whilst certain MSK conditions require the attention of orthopaedic surgeons or rheumatologists, a large proportion can be managed within a non-surgical, primary or intermediate care based, multidisciplinary team. Up to 80% of patients seen in orthopaedic outpatient departments does not go on to require surgery (See appendix 3.1) resulting in suboptimal resource utilization and increased surgical waiting times.

In the emergency care setting, acute musculoskeletal injuries are often referred back to GPs creating an increased workload in primary care, suboptimal injury management and longer waiting times for intervention. There is evidence of overall patient dissatisfaction with this healthcare experience. (See appendix 3.1)

Chronic pain syndromes are often poorly managed in the NHS. Current services are often not based on best available evidence and consequently the vitally important components of exercise and psychological interventions are too often neglected. This leads to excessive morbidity, long-term disability and high use of health care services in both primary and secondary care. (See appendix 3.1.4)

Optimal chronic back pain pathways are rare in the NHS. Chronic back pain costs the economy £12.3 billion per year. (See appendix 3.1.4) Chronic back pain requires a multidisciplinary team approach allowing rapid diagnosis, appropriate investigation conservative and interventional management options with exercise and psychological rehabilitation.

4. Workplace wellness

Key points

- The NHS has a high rate of absenteeism when compared with the rest of the public sector and the private sector (10.7 days per year in the NHS, 9.7 in the rest of public sector, 6.7 in the private sector). (See appendix 4.1)
- Workplace wellness schemes are highly cost-effective.
- Healthcare professionals are more likely to prescribe physical activity if they themselves are physically active.
- Half of NHS staff sickness absence is as a result of musculoskeletal injury.
- SEM physicians are well placed to advice and lead NHS trusts on workplace wellness and physical activity schemes (and on prevention of musculoskeletal injury).

The Boorman report has highlighted the high rates of absenteeism in NHS staff. It reports that the NHS loses 10.3 million working days annually to sickness absence alone. The reports of both Dame Carol Black and PriceWaterhouseCoopers (See appendix 4.1) reviewed workplace wellness schemes and concluded that they are cost-effective with a 2-5:1 return on investment. A common theme of successful schemes reviewed was a physician led service working closely with occupational health.

"Exercise is linked to satisfaction with life and reduces the risk of physical ill health, and our analysis suggests that those who consider themselves to be healthy are less likely to be off sick or to be at work when they are unfit"

Boorman Report- 2009

5. Sport and Exercise Medicine Education

Key points

- Education is the cornerstone to the successful implementation of any cultural change. Improving physical activity levels will require sustained, consistent, evidence-based, patient education delivered by all healthcare professionals. (See appendix 5)
- All healthcare professionals should ask all patients about their physical activity levels - a vital sign.
- SEM specialists are ideally qualified to contribute to the education of all healthcare professionals in physical activity.

Doctors and allied health professionals in all specialties require knowledge of the benefits of physical activity in the prevention and treatment of chronic disease. Moreover sufficient levels of knowledge are needed to enable confident, effective exercise prescription for the vast majority of the population.

Exercise medicine education for doctors remains sparse at an undergraduate and postgraduate level. A recent survey of 33 UK medical schools showed that only 28% devoted time in their curriculum to SEM. (See appendix 5.1) Similarly there is minimal provision for exercise medicine training in postgraduate general practice, medical, and surgical training rotations. Exercise medicine education is available as part of dedicated SEM diplomas and MScs which are costly and time consuming for most general practitioners. (See appendix 5.1) The substantial evidence for the health benefits of physical activity needs to be addressed with medical education at both undergraduate and postgraduate levels. Exercise medicine training needs to be developed to reflect its importance to NHS agendas.

- General practitioners are well placed to deliver cost-effective, initial exercise interventions. (See appendix 1.2) In order to achieve this, training for GPs will need to be improved to allow effective exercise prescription for all, and appropriate referral to SEM consultants for those patients requiring specialist input. (See appendix 1.4)
- Specialist trainees will require training in order to ensure that exercise is prescribed as a part of routine clinical practice and that rehabilitation programmes for chronic disease are effective.
- Secondary care consultants will need exercise medicine training as part of their continuing professional development programmes.

It is essential that advice given by nurses, physiotherapists, occupational therapists, pharmacists and other allied healthcare providers is consistent with medical advice. This will require local and national educational collaboration.

6. Sport and Exercise Medicine research

Key points

- There is significant evidence of the importance of physical activity in the primary and secondary prevention of chronic disease – less robust evidence tells us which interventions work.
- Pragmatic RCTs on the cost-effectiveness and feasibility of translational research of complex physical activity interventions are required.
- NHS Sport and Exercise Medicine investment will provide the environment further to develop this evidence-base and ultimately improve clinical practice and reduce associated healthcare costs.

Translational research is the science behind identifying evidence, assessing its relevance and incorporating it into everyday practice. Exercise medicine interventions are, by necessity, complex interventions. Although current evidence of the efficacy of physical activity in the prevention and treatment of chronic disease is conclusive, high quality randomised controlled trials aimed at assessing the feasibility and cost-effectiveness of specific interventions within the NHS are required to address unanswered questions. A recent meta-analysis of cost-effectiveness of primary care interventions highlighted some of the problems with current literature. (See appendix 6) It is essential that the NHS is armed with high quality translational research on which to base long-term decisions. This has been echoed by the National Institute for Health and Clinical Excellence.

7. How can Sport and Exercise Medicine specialists help?

Sport and Exercise Medicine is a collection of highly commissionable services the sum or components of which can be chosen by individual consortia

Key points

SEM was accredited as a discrete specialty of medicine in 2005. In doing this the DH followed many other developed countries in recognising the contribution that this discipline could make to national health. The specialty of SEM is led by The Faculty of Sport and Exercise Medicine (www.fsem.ac.uk) and the British Association of Sport and Exercise Medicine – founded in 1953 (www.basem.co.uk).

SEM specialists are trained in education, physical activity and chronic disease, exercise physiology, public health, general practice and musculoskeletal medicine, and are therefore well equipped to lead teams focussed on exercise and musculoskeletal medicine. This section describes how SEM specialists can help with the problems identified in this document.

Prevention and treatment of chronic disease

It is clear that in order to effect the required cultural change, physical activity enquiry and advice need to become a routine part of all medical encounters (in both primary and secondary care). It is anticipated that an SEM led service would relieve many of the pressures placed upon GPs and Hospital specialists in dealing with physical inactivity by providing, organising and supporting clear patient pathways which are based on available local resources but sensitive to the medical, cultural and social needs of individuals.

In primary care SEM specialists can:

- Provide a comprehensive and progressive educational programme for the primary care team so that exercise prescription is prioritised within the patient's healthcare experience and consistent, evidence-based, effective physical activity advice is provided across the primary health care team. This follows the classical model of medical education where clinical education for doctors is provided by specialists in that field.
- Work with primary care teams to develop locally agreed protocols to facilitate effective physical activity prescription within primary care. This could include risk

assessment, triage systems sensitive to individual barriers, coordination of local resources and meaningful evaluation. Practices may choose to deliver physical activity advice in a number of ways, either directly or through ancillary staff. (See appendix 1.2) Coordination of this effort is required with effective education for all staff delivering physical activity interventions, clear patient pathways for all risk categories including those with multiple co-morbidity and robust evaluation of services.

- Establish multidisciplinary teams to provide a single point of referral for patients identified as requiring specialist help, for example those with complex medical and/or musculoskeletal problems, those with co-morbidity and those requiring specialist help to effect behavioural change. (See appendix 2.3)
- Provide appropriate resources to aid long term adherence: for example written and internet based aids, motivational tools and support systems.
- Work with the fitness industry to maximise accessibility of supported exercise to all patients irrespective of age, co-morbidity, social and cultural position. SEM specialists will work with the fitness industry both nationally and locally to improve patient pathways ensuring that people with chronic disease receive uniform and evidence-based advice in the NHS and the fitness industry.
- Ensure that appropriate non-gym-based local physical activity programmes are accessible to all.

In secondary care SEM physicians can:

- Provide an on-going and progressive exercise educational programme for teams working in specific chronic disease areas e.g. orthopaedics, rheumatology, obstetrics, orthopaedics, surgery and oncology.
- Ensure that chronic disease rehabilitation schemes are patient-centred rather than disease-centred and available to all irrespective of morbidity.
- Ensure that clear patient pathways exist so that the patient journey between primary and secondary care is seamless.
- Provide a specialist service including clinical exercise testing and risk assessment for those with exercise intolerance, those with co-morbidity, those with chronic pain and pre-operative patients to assess anaesthetic risk.

Exercise prescription should sit alongside pharmaceutical and surgical interventions. The cultural change required to improve national physical activity levels can be and should be led by the NHS.

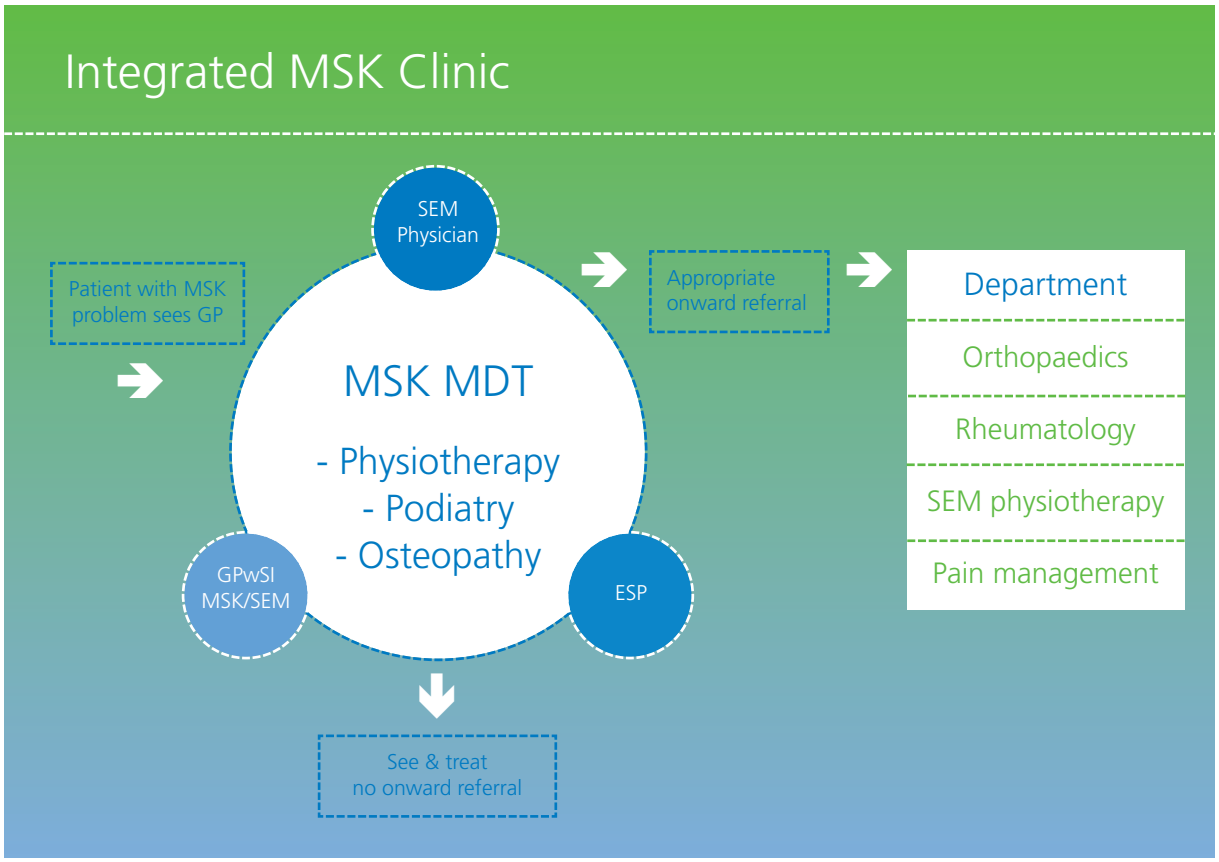
Exercise medicine is a new way of working, a bridge between public health, primary and secondary care and the fitness industry. It is a patient-centred, evidence-based, collaborative way of addressing our physical inactivity endemic.

Musculoskeletal services

The development of SEM as a speciality has a unique opportunity to add value to musculoskeletal services already in existence. SEM requires close working relationships with other health professionals such as physiotherapists, podiatrists, dietitians and exercise physiologists. SEM specialists are able to play a pivotal role in managing, co-ordinating and supporting MSK clinics in both the primary and secondary care setting.

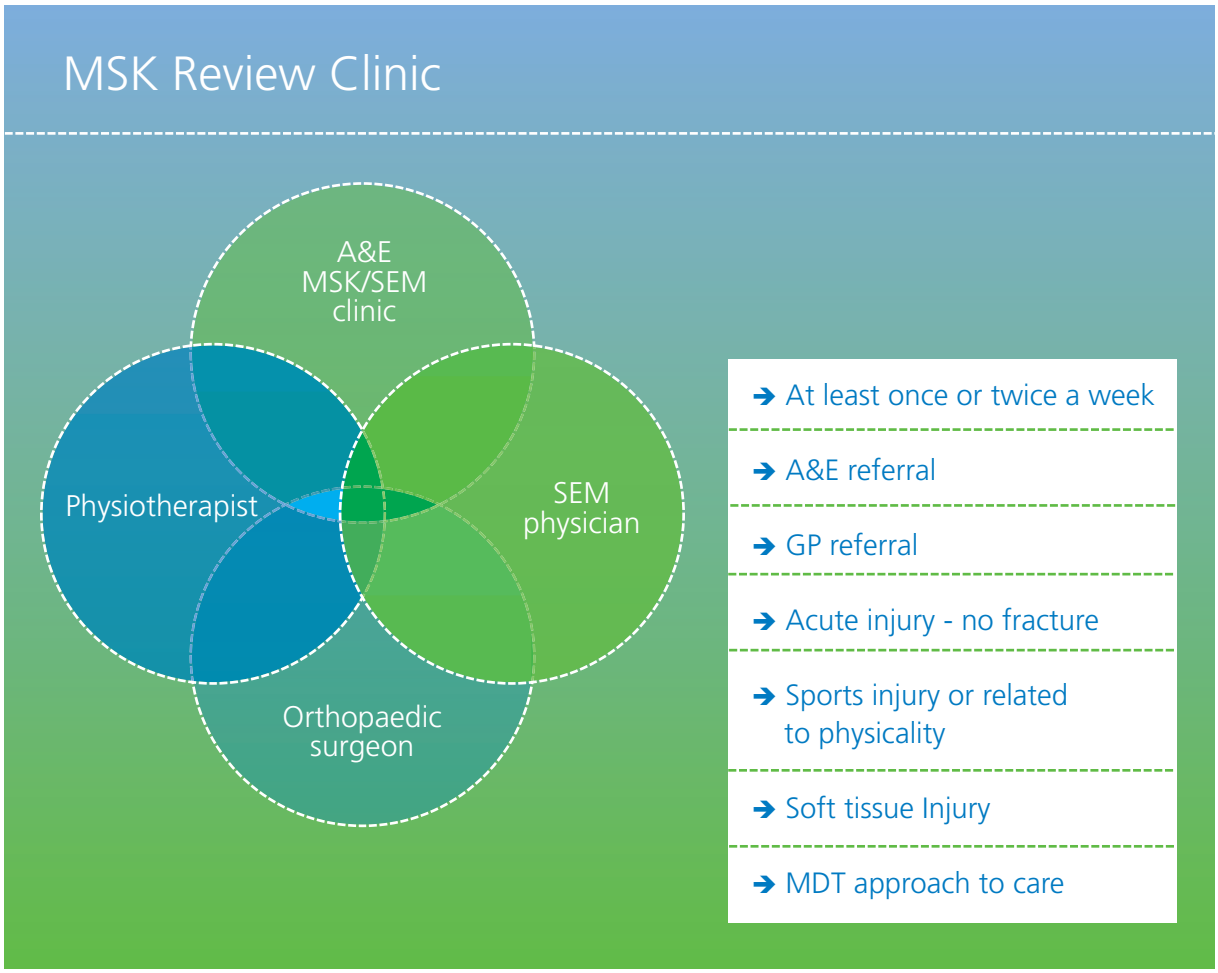
Early work suggests that considerable savings can be made through the delivery of non-surgical musculoskeletal services in a primary care setting. (See appendix 3.1) There is consistent evidence to show that patients seen by a MSK specialist in the primary care setting have shorter waiting times and greater satisfaction with the experience compared with those treated in secondary care. (See appendix 3.1) The presence of an SEM consultant in a primary care musculoskeletal interface clinic will:

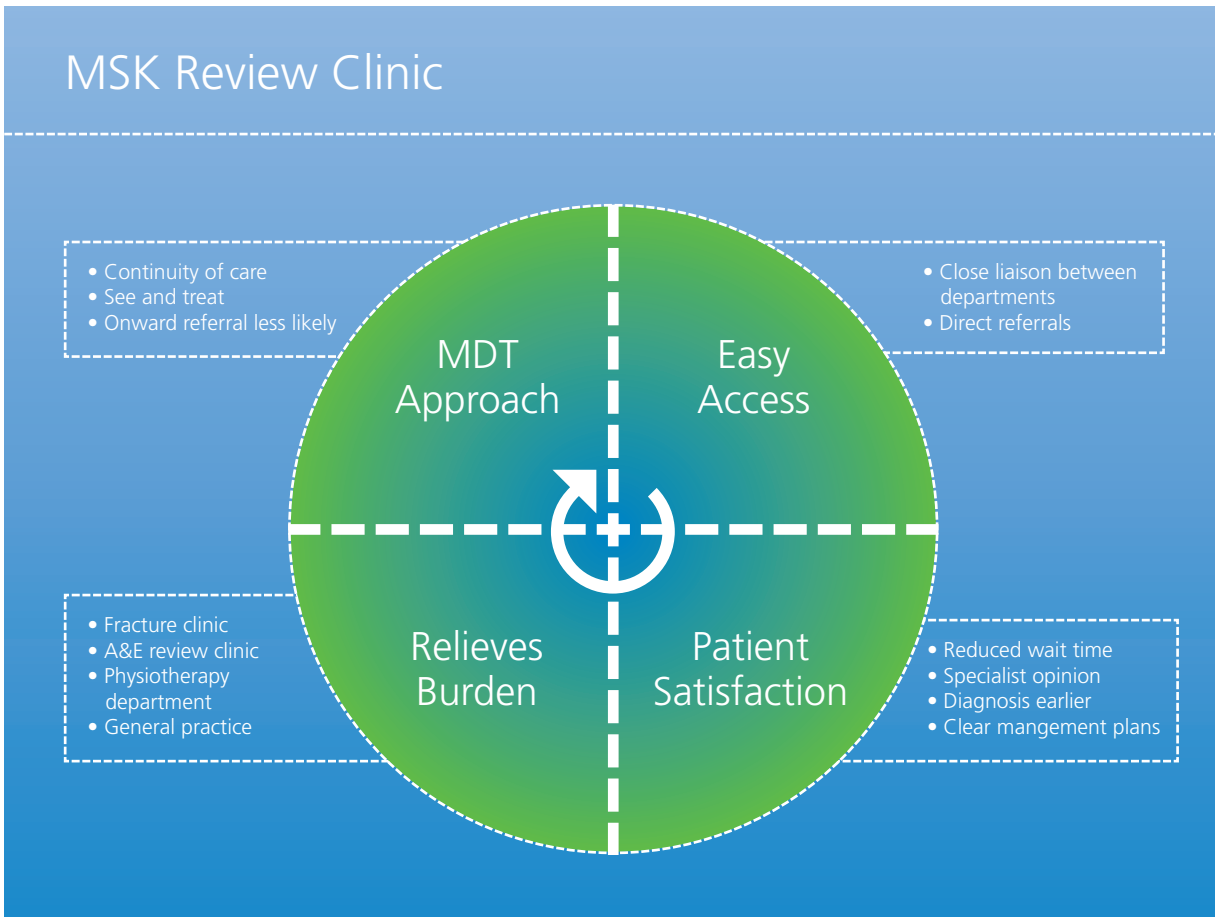
- Provide easier access to a specialist opinion for patients and healthcare professionals: integrated care pathways.
- Make available a skill set to expedite diagnosis and management such as performing basic ultrasound scans and evidence-based guided injection therapies.
- Provide support for other primary healthcare professionals such as extended-scope physiotherapists (ESPs) and general practitioners with specialist interests (GPwSI).
- Introduce a formal system of continued professional development and appraisal for physicians working within musculoskeletal interface services.



In secondary care, SEM physicians can:

- Provide Sport and Exercise Medicine clinics for secondary and tertiary referrals for soft-tissue and sports injuries and more chronic presentations. There is added value from 'one-stop-shop' Sport and Exercise Medicine clinics providing radiology, orthotic and physiotherapy as a combined service – existing examples include Nottingham, Oxford, Sheffield and Leicester.
- Work with existing orthopaedic, physiotherapy and emergency department services by providing rapid access clinics to identify, treat and rehabilitate acute injuries which do not require surgery. This echoes the integral message of the international "Bone and Joint Decade 2010-2020". (See appendix 3.2)
- Add value to existing back pain teams providing specialist diagnosis, management and where appropriate fluoroscopic guided injection therapy and exercise rehabilitation.
- Provide specialist leadership to multidisciplinary chronic pain syndrome teams expediting diagnosis, avoiding unnecessary investigation and providing evidence-based, early, progressive aerobic exercise prescription and appropriate pharmaceutical treatments for this challenging group. (See appendix 3.1.3)





In summary, SEM specialists offer the NHS alternative and contemporary pathways in managing MSK conditions and in so doing can relieve the cumulative pressures seen on existing services.

Workplace wellness

SEM physicians are ideally placed to coordinate and support many (including physical activity) aspects of workplace wellness schemes. They are trained in public health, exercise interventions, musculoskeletal health and management and thus can advise on effective physical activity interventions and injury prevention and treatment in the workplace. This service needs to be considered by primary care, secondary care and other healthcare employers. Current examples of good practice exist and have been highlighted. (See appendix 4.2)

"Healthy citizens are the greatest asset any country can have."

Sir Winston Churchill

Education

SEM specialists are ideally qualified to deliver comprehensive, on-going educational programmes to doctors and ancillary health workers at an undergraduate and postgraduate level. These programmes can be delivered in primary and secondary care.

SEM specialists will also work to improve undergraduate curricular so that exercise and musculoskeletal medicine is given appropriate emphasis.

Research

Many SEM specialists have research training. They are appropriately placed to have access to patient groups and audits, and have the clinical expertise to work with academic research bodies to ensure that high quality, translational research occurs in both primary and secondary care settings. This is vitally important as the NHS strives to translate evidence into cost-effective practice. NICE guidance for physical activity interventions in primary care stipulates the need for all new services to be evaluated as part of a well designed and controlled research project. SEM specialists would be well placed to undertake this vital translational work.

In July 2007 The Institute of Sport and Exercise Medicine became the research arm of The UK Faculty of SEM and is aims to deliver, promote and ensure good governance of high quality research in the field of Sport and Exercise Medicine.

"Creative thinking may mean simply the realisation that there is no particular virtue in doing things the way they have always been done."

Rudolf Flesch

8. Implementing Sport and Exercise Medicine in the NHS

Key points

- It is expected that different localities will choose to implement SEM services in variable ways and over differing timescales according to local needs.
- The development of SEM services can be flexible according to local pressures and need.
- SEM can be commissioned by primary care, secondary care and public health.

It is likely that SEM will be funded through primary care, secondary care and public health with input from universities and research bodies.

Individual localities will have differing needs and will therefore have the opportunity to negotiate specific contracts with providers of SEM services based on these needs. Each contract will need to have clear aims, realistic timeframes and measurable outcomes.

'Liberating the NHS' describes how primary care consortia will commission new services based on local need, cost-effectiveness and patient demand. There is a clear opportunity within this structural reorganisation to ensure that SEM services are fit for purpose.

SEM services in some of the areas mentioned in this document currently exist within the UK and abroad. Examples of these services can be obtained from The Faculty of Sport and Exercise Medicine. The Faculty of SEM expect that current services will be developed to reflect the broader range of services that can be offered by SEM as highlighted in this document.

Appendices

1 – Primary prevention

1.1: Physical activity policy documents

1. Foresight report, 2007. Tackling Obesities: Future Choices

The report highlights the growing obesity epidemic and recognises the social and economic burden to the UK. It estimated that 28% of women and 33% of men would be obese by 2010. Similar trends are seen in children. The report acknowledges that understanding and preventing obesity is complex. It sets out key recommendations and actions for local governments to positively change obesity levels. Recommendations for implementing change can be achieved with a variety of providers including health, sports councils, the voluntary and private sectors.

2. Let's get moving - A new physical activity care pathway for the NHS: Commissioning guidance, 2009

'Let's get moving', published by the Department of Health, discusses the importance of physical activity and the potential health gains from active lifestyles. It reiterates the importance of creating a shift in societal attitudes and behaviour towards physical activity which is essential if we are to improve health. The document outlines opportunities for Primary Care Trusts to implement structured evidence-based approach to the promotion of physical activity. It discusses the National Institute for Health and Clinical excellence (NICE) guidance for brief interventions in primary care and how they align to world class commissioning and local commissioning processes. 'Let's get moving' provides encouragement for patients in setting physical activity goals, utilising community based physical activities and inspiring people to gradually become more physically active.

3. Change4life, Department of Health, 2008

The Department of Health launched the Change for Life campaign in order to reduce the number of people who are obese or overweight and prevent the problem escalating to the stage where experts estimated a financial burden to the NHS of £50 billion by 2050. Change for Life is a lifestyle campaign involving thousands of local organisations and charities which support families in maintaining a healthy lifestyle.

4. Be active, be healthy: a plan for getting the nation moving, Department of Health, 2009

Be active, be healthy sets out a framework for delivering physical activity alongside sport leading up to and beyond the 2012 Olympic and Paralympic Games. The aim of the programmes are to contribute to the legacy of getting two million more people active by the Games. In order to achieve these goals, the document outlines ideas for Local authorities and Primary Care Trusts to determine and respond to the needs of local

communities in order to encourage more physical activity. It documents the NHS costs of physical activity in every PCT in England, averaging £5 million per PCT per year.

5. CMO report 2005 At least 5 a week: Evidence on the impact of physical activity and its relationship to health

Physical activity not only contributes to well-being, but is essential for good health. This document outlines the benefits of physical activity with a reduced risk of developing major chronic diseases – such as coronary heart disease, stroke and Type 2 diabetes by up to 50%. It is estimated the annual cost of physical inactivity in England at £8.2 billion, which does not include the contribution of inactivity to obesity (estimated at a further £2.5 billion per year). The report calls for an essential change in behaviour and attitude towards physical activity if we are to address the epidemic. The wealth of supporting scientific literature for the prevention of chronic disease is acknowledged. The recommendations for physical activity for general health, is a total of at least 30 minutes a day of at least moderate intensity physical activity on five or more days of the week in order to reduce the risk of premature death from cardiovascular disease and some cancers, significantly reduce the risk of type 2 diabetes, and improve psychological well-being.

6. 2011 White Paper, Department of Health

The White Paper contains a number of key public health themes. Sport and physical activity are referenced throughout the document as examples of how to improve public health from a health and well-being perspective. The paper discusses physical activity initiatives, noting the mass participation legacy as one arm of the public health drive and the importance of building upon the Olympic and Paralympic message.

7. Pate, R. et al., 1995 Physical activity and public health: A recommendation from the Centre of Disease Control and Prevention and the American College of Sports Medicine. JAMA. 273: 402-408

There is overwhelming evidence that regular physical activity has important and wide ranging health benefits. These range from reduced risk of chronic diseases such as heart disease, type 2 diabetes, and some cancers to enhanced function and preservation of function with age. There is also strong emerging evidence that activity delays cognitive decline and is good for brain health as well as having extensive benefits for the rest of the body. In 1994 Morris made a convincing argument that physical activity was the best buy in public health. This argument was based on the high prevalence of physical inactivity (for example, twice as many people are inactive compared to the number who smoke) and a relative risk for coronary heart disease, for those who are inactive, that is similar in magnitude to that of smoking, high levels of cholesterol or hypertension. The Chief Medical Officer has since commented that physical activity must be one of the most undervalued interventions to improve public health.

8. On the state of public health: Annual report of the Chief Medical Officer 2009

The CMO addresses major health issues and the importance of establishing and maintaining regular physical activity throughout life. Health benefits include: stopping and reversing weight gain; reducing the risk of diabetes, heart disease, stroke and some cancers; and preventing osteoporosis and reducing falls in older people

9. Health Survey for England 2008. Physical activity and fitness

This survey investigates physical activity levels in adults and children in the UK. It finds that only 39% of men and 29% of women meet the Chief Medical Officer's minimum physical activity recommendation when measured subjectively and only 6% of men and 4% of women meet recommendations when measured objectively with accelerometer.

10. Start Active, Stay Active' is a report on physical activity for health from the four home countries' Chief Medical Officers 2011.
www.bhfactive.org.uk/userfiles/Documents/startactivestayactive.pdf

These scientifically informed guidelines update the existing guidelines for physical activity in children, young people and adults, and include new guidelines for early years and older people. For all age groups, they highlight the risks of excessive sedentary behaviour, which exist independently of any overall volume of physical activity.

1.2: Primary care physical activity intervention review papers

1. NICE guidance on brief interventions in primary care
www.nice.org.uk/nicemedia/pdf/PHYSICAL-ALS2_FINAL.pdf

The Public Health Interventions Advisory Committee (PHIAC) considered both a review of the evidence and an economic appraisal before developing these recommendations. The reference guide presents recommendations on four commonly used methods to increase physical activity: brief interventions in primary care, exercise referral schemes, pedometers and community-based exercise programmes for walking and cycling. This guidance only considers whether these four methods are effective at encouraging individuals to become more active: a broader range of methods will be the subject of future NICE programme guidance. Physical activity has a range of benefits and practitioners should encourage people to incorporate regular activity into their daily lives. Brief interventions in primary care involve opportunistic advice, discussion, negotiation or encouragement. They are commonly used in many areas of health promotion, and are delivered by a range of primary and community care professionals. The interventions vary from basic advice to more extended, individually-focussed attempts to identify and change factors that influence activity levels. Exercise referral schemes direct someone to a service offering an assessment, development of a tailored physical activity programme, monitoring of progress and follow-up. Pedometers are a common aid to increasing physical activity through walking. Much of the research about pedometers has involved comparing the validity and reliability of different models. This

guidance focuses on how effective they are at increasing people's physical activity levels. Recommendations are made for primary care practitioners to take the opportunity, whenever possible, to identify inactive adults and advise them to aim for 30 minutes of moderate activity on 5 days of the week (or more). They should use their judgement to determine when this would be inappropriate (for example, because of medical conditions or personal circumstances). They should use a validated tool, such as the Department of Health's forthcoming general practitioner physical activity questionnaire (GPPAQ), to identify inactive individuals. When providing physical activity advice, primary care practitioners should take into account the individual's needs, preferences and circumstances. They should agree goals with them. They should also provide written information about the benefits of activity and the local opportunities

2. Eakin EG, Glasgow RE. Review of primary care based physical activity intervention studies. Effectiveness and implications for practice and future research. J Fam Pract 2000 Feb;49:158–68

Regular exercise prevents disease and promotes health. This is well accepted by patients, providers, and public health experts. The US Preventive Services Task Force has consistently recommended counselling to promote physical activity for all adults. Until recently, however, little evidence existed that such counselling made a difference. Eakin et al systematically reviewed the literature on the effectiveness of exercise counselling in primary care. They concluded that brief primary care based physical activity counselling is modestly effective, particularly in the short term. They suggested tailoring counselling to the patient and providing written materials; focusing on physical activity initially rather than on multiple prevention recommendations; and using other trained members of the healthcare team to counsel patients.

3. Armit CM, Brown WJ, Marshall AL et al. (2009) Randomized trial of three strategies to promote physical activity in general practice, Preventive Medicine 48 (2): 156–63

4. Aadahl M, Huth Smith L. Does a population based multifactorial lifestyle intervention increase social inequality in Physical Activity? The inter99 study. Br J Sports Med. 2011:45;209-215

5. Health Trainers: egg: /www.liverpoolhealthtrainers.org.uk/cpage-95-0-Physical-Activity.html

Health trainers are currently being used by some public health departments as an additional patient education resource for primary care. They are able to deliver basic physical activity advice and identify high risk patients. They can also provide information about local physical activity schemes. While this is likely to be an additional tool to alleviate some of the time pressures in primary care, health trainers do not provide a service which could not be provided by well-educated primary health care teams who have access to internet based local information sites.

6. www.getoxfordshireactive.org/: Internet based physical activity scheme example

7. Prescribing Exercise in Primary Care. Khan, Weiler, Blair. BMJ 2011;343:d4141

1.3: Physical activity in the primary prevention of disease

There is compelling literature on the primary prevention of disease with physical activity. Key review papers are given below.

1. Information Services Division Scotland (2005) The Scottish Health Survey 2003. Volume 1: Cardiovascular disease. www.isdscotland.org/chdstroke

Key lifestyle risk factors for coronary heart disease include smoking, poor diet and lack of exercise. About one and a quarter million people in Scotland smoke. The incidence of CHD is highest amongst people who are obese. Overall, 27% of men and 28% of women in Scotland are now obese (Scottish Health Survey 2009). Regular physical activity reduces the risk of coronary heart disease mortality. Physically inactive people have about double the risk of CHD.

2. The burden of physical inactivity related ill health in the UK World Health Report 2002- Reducing risk, promoting healthy life

The document outlines the global prevention and promotion of health and wellbeing. Obesity rates have shown to have risen three fold of more since 1980 in some areas of North America, UK and eastern Europe. It estimates that one billion adults worldwide are overweight and at least 300 million clinically obese. This leads to adverse metabolic effects on blood pressure, cholesterol, triglycerides and insulin resistance. Raised body mass index increases the risks of coronary heart disease, ischemic stroke, Type 2 diabetes, cancer of the breast, colon, prostate, endometrium, kidney and gallbladder. In the WHO report, analyses show that approximately 58% of diabetes, 21% of ischemic heart disease and 8-42% of certain cancers were attributable to A BMI above 21kg/m2. Overall physical inactivity is estimated to cause 1.9 million deaths globally.

3. Physical activity for the primary prevention of disease. Systematic review of randomised controlled trials. Dan Med Bull. 2005 May;52(2):86-9

4. Gillies CL, Abrahams KR et al. Pharmacological and lifestyle interventions to prevent type 2 diabetes in people with IGT: systematic review and meta-analysis. BMJ2007;334:229

Lifestyle and pharmacological interventions reduce the rate of progression to type 2 diabetes in people with impaired glucose tolerance. Lifestyle interventions seem to be at least as effective as a drug treatment.

5. Yusuf S, Hawken S. The INTERHEART study. Effect of potentially modifiable risk factors associated with myocardial infarction in 52 countries: a case control study. Lancet 2004;364:937-52

6. Cancer Prevention report. World cancer research fund and American Institute of Cancer Research. 2007 www.wcrfuk.org/research/cp_report.php

This report states that 30% of cancers are preventable with lifestyle modification and highlights the strong evidence to suggest that both breast and colorectal cancer are preventable with physical activity.

1.4: Physical activity and primary care pathways

1. Khunti. Unanswered questions over NHS health checks. BMJ 2011;342:316-8

This editorial discusses the potential implications of NHS health checks including in relation to physical activity. Using these checks, high risk individuals will be identified. There is currently no support to GPs in the management of these individuals in relation to physical activity and a lack of robust translational research to inform policy makers in designing primary care physical activity care pathways. These checks are currently being piloted and are due to be implemented in 2012-13.

2. Weiler R. Physical Activity in the UK. A unique crossroad. Editorial BJSM June 2010 Br J Sports Med. www.ncbi.nlm.nih.gov/pubmed/20584754#>2010 Oct;44(13):912-4

This editorial discusses the importance of physical activity interventions in primary care and the potential use of GPPAQ.

3. Department of Health: putting prevention first - vascular checks: risk assessment and management. 2008

The document sets out the plans for the NHS to introduce a systematic and integrated programme of vascular risk assessment and management for those aged between 40 and 74. It explains in more depth what vascular disease is, why undertaking risk assessment and management is important, and how these checks might be performed throughout England. It calls for stakeholders to work with the Department of Health to help develop the approach to implementation and delivery over the next few months.

4. NHS Health Checks. The learning network 2010

The vascular risk assessment and management programme – formerly known as the vascular check programme and now called NHS Health Check – is a national initiative. The tests, measurements and risk management interventions that make up the check can be delivered in different settings and in different ways to suit the needs of local populations. It is however important that the tests and measurements themselves are

quality assured. Equally, it is key that the actions taken at certain thresholds are the same where possible, and in line with national guidelines where appropriate, if a systematic approach to the check across England is to be achieved. Sections on physical activity and weight management interventions, and on NHS stop smoking services referrals, are provided within the guidance to help PCTs in their provision of lifestyle advice.

5. Thomas S, Reading J. Revision of the Physical Activity Readiness Questionnaire (PAR-Q). www.csep.ca/english/view.asp?x=698Can J Sport Sci. 1992 Dec;17(4):338-45

The original Physical Activity Readiness Questionnaire (PAR-Q) offers a safe preliminary screening of candidates for exercise testing and prescription, but it screens out what seems an excessive proportion of apparently healthy older adults. To reduce unnecessary exclusions, an expert committee established by Fitness Canada has now revised the questionnaire wording. The present study compares responses to the original and the revised PAR-Q questionnaire in 399 men and women attending 40 accredited fitness testing centres across Canada. The number of subjects screened out by the revised test decreased significantly ($p < .05$), from 68 to 48 of the 399 subjects. The change reflects in part the inclusion of individuals who had made an erroneous positive response to the original question regarding high blood pressure. There is no simple gold standard to provide an objective evaluation of the sensitivity and specificity of either questionnaire format, but the revised wording has apparently had the intended effect of reducing positive responses, particularly to the question regarding an elevation of blood pressure.

1.5: Economic burden of physical inactivity

1. Allender S, Foster C. The burden of physical activity related ill-health in the UK. J Epidemiol community health 2007;61:344-348

This document assessed the direct costs of physical inactivity to the NHS in 2002 at £1.06 billion. It used diseases defined by WHO as being directly related to physical inactivity- Ischemic Heart disease, ischaemic stroke, breast cancer, colon/rectal cancer and type 2 diabetes mellitus. It excludes diseases such as osteoporosis, hypertension and musculoskeletal disease.

2. Department of Health. Choosing activity: a physical activity action plan. London Dept of Health 2005

This document estimates the direct and indirect costs of physical inactivity in the UK at £8 billion. The main reasons for the difference in this and the previous study is the addition of indirect costs to the economy.

3. Anderson LH, Martinson BC, Crain AL, Pronk NP, Whitebird RR, Fine LJ, et al. Health care charges associated with physical inactivity, overweight, and obesity.Prev Chronic Dis. 2005 Oct;2(4):A09. Epub 2005 Sep 15

Physical inactivity, overweight, and obesity were associated with 23% (95% confidence interval [CI], 10%-34%) of health plan health care charges and 27% (95% CI, 10%-37%) of national health care charges. Although charges associated with these risk factors were highest for the oldest group (aged 65 years and older) and for individuals with chronic conditions, nearly half of aggregate charges were generated from the group aged 40 to 64 years without chronic disease.

4. Nazmi, S. Physical inactivity and its impact on healthcare utilisation. Health Economics, 18(8):885-901

Physically inactive people are expected to use more healthcare services than active people. This inactivity imposes costs on the collectively funded health insurance programs. In this paper, excess utilisation of healthcare services due to physical inactivity is examined using count data models and the Canadian Community Health Survey. The aim of the paper is to estimate utilization of healthcare services associated with inactivity and to estimate its impact on the Canadian healthcare system. The results suggest that physical inactivity increases hospital stays, and use of physician and nurse services. On average, an inactive person spends 38% more days in hospital than an active person. S/he also uses 5.5% more family physician visits, 13% more specialist services, and 12% more nurse visits than an active individual. The subsequent social cost of inactivity for the healthcare system is substantial.

5. Katzmarzyk PT. The economic burden of physical inactivity in Canada. CMAJ 2000:163;1435-40

6. Mathers CD. The burden of disease and injury in Australia. BullWHO 2001;79:1076-84

7. Ossa.D, Hutton.J. The economic burden of physical inactivity in England. 2002. Medtap international report

8. Start Active, Stay active. Chief Medical Officer 2011

2 – Secondary prevention

2.1: Effectiveness of exercise in the secondary prevention of chronic disease

The evidence for the effectiveness of exercise interventions for chronic disease is extensive and compelling. A full review of the evidence is beyond the scope of this paper, however, references for key papers in each disease area are provided.

1. Evidence for Prescribing Exercise as a therapy in Chronic Disease. Pedersen B.K, Saltin B. Scand J Med Sci Sports 2006: 16 (Suppl. 1): 3–63

This article is a review of evidence across chronic disease and gives an overview of exercise recommendations in chronic disease states

2. Taylor R.S, Brown A. Exercise-Based Rehabilitation for Patients with Coronary Heart Disease: Systematic Review and Meta-analysis of Randomized Controlled Trials. Am J Med 2004: 116;682-692

This is a comprehensive literature review of effectiveness of cardiac rehabilitation programmes.

3. Exercise in type 2 diabetes 2009. Cochrane review www.thecochranelibrary.com

4. Physical Activity and survival after Breast Cancer diagnosis: A meta-analysis of published studies. Ibrahim EM, Al-Homaidh A. Med Oncol 2010 www.cancer.gov/cancertopics/factsheet

5. Pulmonary Rehabilitation for Chronic Obstructive Pulmonary disease 2009 www.thecochranelibrary.com

6. American College of Rheumatology. Guidelines for the management of RA:2002 Update. Arthritis Rheum(2002) 46:328-46

7. The Care and management of osteoarthritis in adults. National Institute of Clinical Excellence. www.nice.org.uk/nicemedia/pdf/CG59NIC

8. Physical Activity and Exercise recommendations for stroke survivors Stroke2004;35;1230-1240

9. Effects of physical Activity during cancer treatment. Hayes et al (2009) J Sports & Med in Sport; 12 428-434

10. ACOG Committee.

Opinion no. 267: exercise during pregnancy and the postpartum period. Obstet Gynecol2002;99:171–3.

2.2: Adherence to exercise

Reasons for non-adherence to exercise interventions appear to be complex and multifactorial. It is clear that adherence would be improved by focussing on individual barriers to exercise. A comprehensive literature review is beyond the scope of this paper, however, below is a sample of the extensive literature on this subject

1. The Health Survey for England 2007: Healthy lifestyles: knowledge, attitudes and behaviour. Comissioned by the NHS Information Centre for Health and Social Care

About a quarter of adults aged 16-64 (27% of men and 29% of women) thought they knew the current recommendations for physical activity, but when asked how much physical activity they thought people their own age should do, fewer than 1 in 10 adults specified a level equivalent to the Chief Medical Officer's (CMO's) minimum recommended target. A further 25% of men and 23% of women specified a level of physical activity greater than the minimum recommendations, while most either under-estimated how much physical activity adults should do or did not know. Attitudes to physical activity were very similar between men and women aged 16-64. 44% of men and 45% of women agreed that they could get enough physical activity in their daily life without specific activities such as jogging or going to the gym. A high proportion of adults agreed that physical activity was good for health even if it was moderate, even if it was for only for 10 minutes at a time, and if it lasted at least 30 minutes. Around half agreed that physical activity is better 'if it gets you out of breath' (51% and 50% respectively). Barriers to doing more physical activity included work commitments (45% of men, 34% of women) and lack of leisure time (38% of men, 37% of women). Caring for children or older people was cited by a quarter of women (25%) but only 13% of men. Other barriers to doing more physical activity included lack of money (13% of men, 16% of women) and poor health (10% of men, 13% of women). 21% of men and 25% of women reported they were not motivated to do more; however, almost no one thought exercise was a waste of time. Factors that would encourage more physical activity, as well as more leisure time or self-motivation, included motivations relating to the participant's own ill health or advice from a doctor or nurse.

2. DNA' may not mean 'did not participate': a qualitative study of reasons for non-adherence at home- and centre-based cardiac rehabilitation. Jones, M, Jolly, K. Family Practice 2007 24(4):343-357

3. Assessing patients' beliefs about cardiac rehabilitation as a basis for predicting attendance after acute myocardial infarction A F Cooper1,*, J Weinman.. Heart 2007:93;53-58

4. Home based versus centre based exercise interventions in older adults. Ashworth, N, Chad, K. Cochrane Database Syst Rev. 2005 Jan 25;(1):CD004017

5. Interventions to improve adherence to exercise for chronic musculoskeletal pain in adults.Jordan JL, Holden MA, Mason EE, Foster NE. Cochrane Database Syst Rev. 2010 Jan 20;(1):CD005956

6. Predictors of dropout form an outpatient cardiac rehabilitation programme. Yohannes, A, Yalfani A. Clinical Rehabilitation. 2007: 21, No. 3;222-229

7. HIV Patient Characteristics that Affect Adherence to Exercise Programmes: An Observational Study Andrea Petróczi, 1,2 Kim Hawkins. Open AIDS J. 2010; 4: 148–155

8. The practitioner, the patient and resistance to change: Recent ideas on compliance. Butler C, Rollnick S. CAN MED ASSOC J MAY 1, 1996; 154 (9)

9. McKenna J, Naylor PJ, McDowell N. Barriers to physical activity promotion by general practitioners and practice nurses. Br J Sports Med 1998;32:242–7

2.3: Current Services for chronic disease physical activity management

Broadly services for exercise in chronic disease are currently provided in two ways.

1. Exercise rehabilitation services such as cardiac rehabilitation, pulmonary rehabilitation and falls teams

Cardiac rehabilitation has now existed throughout the UK for a number of years. There are detailed service evaluations now available and reviews and meta-analyses which make it possible to assess service need. These needs can logically be extrapolated to other chronic disease rehabilitation services.

2. Beswick AD, Rees K. Provision, uptake and cost of cardiac rehabilitation programmes. Health technology assessment 2004 8(41)

Despite this a recent review of cardiac rehabilitation has identified a number of problems.

- Provision of cardiac rehabilitation in the UK is low falling well below the NSF-CHD goal of 85% of eligible patients being offered cardiac rehabilitation.
- Uptake in patients offered cardiac rehabilitation is low with estimates of 27-41% of those patients being offered cardiac rehabilitation, attending.
- There are a variety of reasons for this low uptake which reflect well known patient barriers to exercise.

- Psychological interventions improve uptake.
- Older people, women, ethnic minority groups and those with co-morbidity are the least likely to attend cardiac rehab.
- Audit of services is uncoordinated with a resulting lack of usable data on successful service models and lack of accurate long term adherence data Rehabilitation also exists for chronic pulmonary disease in many areas and is provided in a similar way. Other disease areas such as cancer, obesity, osteoporosis and diabetes have at best a sporadic provision across the UK.

The disadvantages of this fragmented, disease specific approach are well documented:

- Exclusion of patients with complex co-morbidity.
- Lack of availability of specific exercise advice for some chronic disease states, e.g. cancer, congestive heart failure.
- Inflexible approach to exercise interventions. The limited budgets of individual rehabilitation departments often leads to exercise interventions being fairly rigid and inflexible. For example many cardiac and pulmonary rehabilitation schemes are purely gym-based which does not offer the level of patient choice required to improve concordance.
- Duplication of services.
- Similar intervention irrespective of previous physical activity level.
- Disease-centred approach rather than patient-centred approach.

3. Exercise on referral schemes

These schemes are typically based in primary care and are usually gym membership schemes whereby patients are referred within strict referral criteria through primary care to subsidised gyms under the care of fitness instructors.

Williams N, France B. Effectiveness of exercise on referral schemes to promote physical activity in adults. Systematic review. BJGP. 2007.57(545)

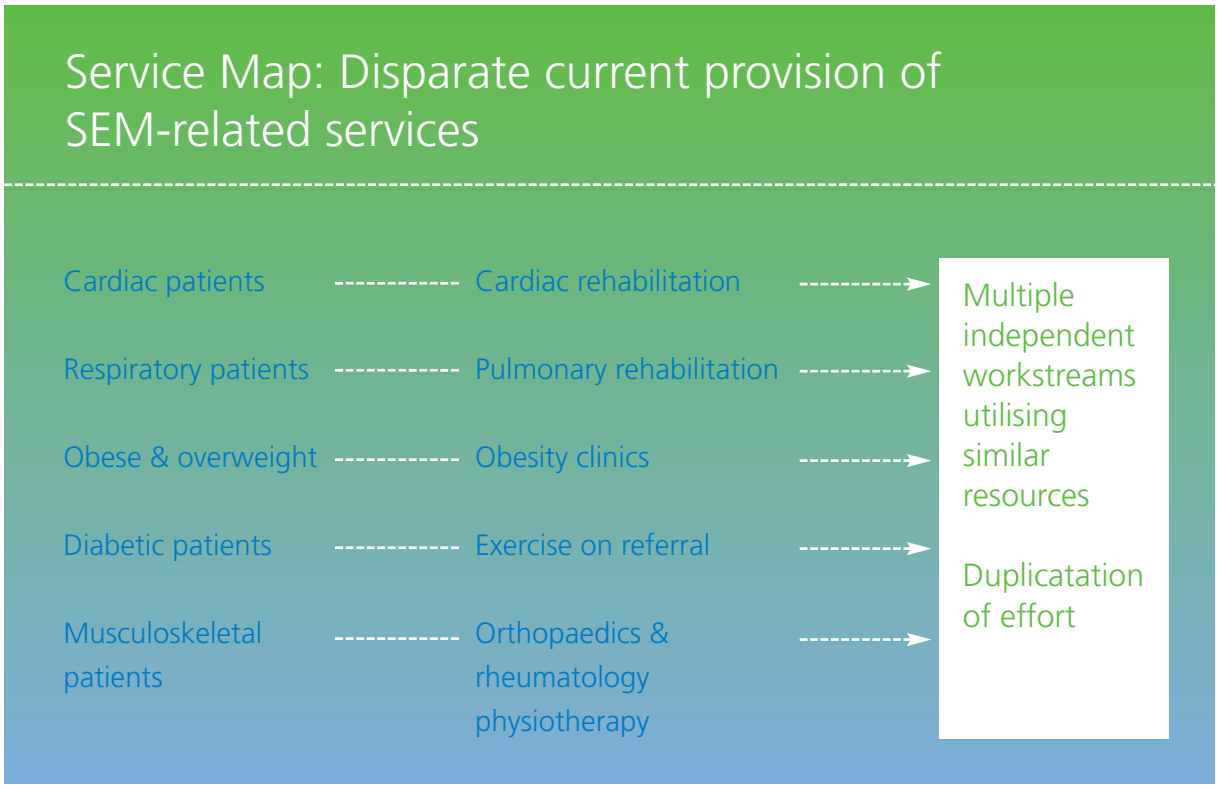
This review confirmed poor long-term behavioural change figures across these schemes and identified reasons for this which reflect well documented barriers to exercise. The review concluded that 17 patients need to be referred within these schemes for one to become moderately physically active in the short term.

The main disadvantages of these schemes are:

- Primarily gym-based exercise, which is its own barrier.
- Inability to prescribe exercise to patients with co-morbidity or more severe chronic disease.
- Lack of flexibility to adapt to differing working patterns.

- Poor patient pathways between secondary care rehabilitation schemes, where patients are heavily supported, to exercise on referral schemes where the level of support is often not sufficient to care for patients with poor confidence and self-efficacy.
- Lack of coordinated short and long-term audit data and objective data on changes in physical activity levels.

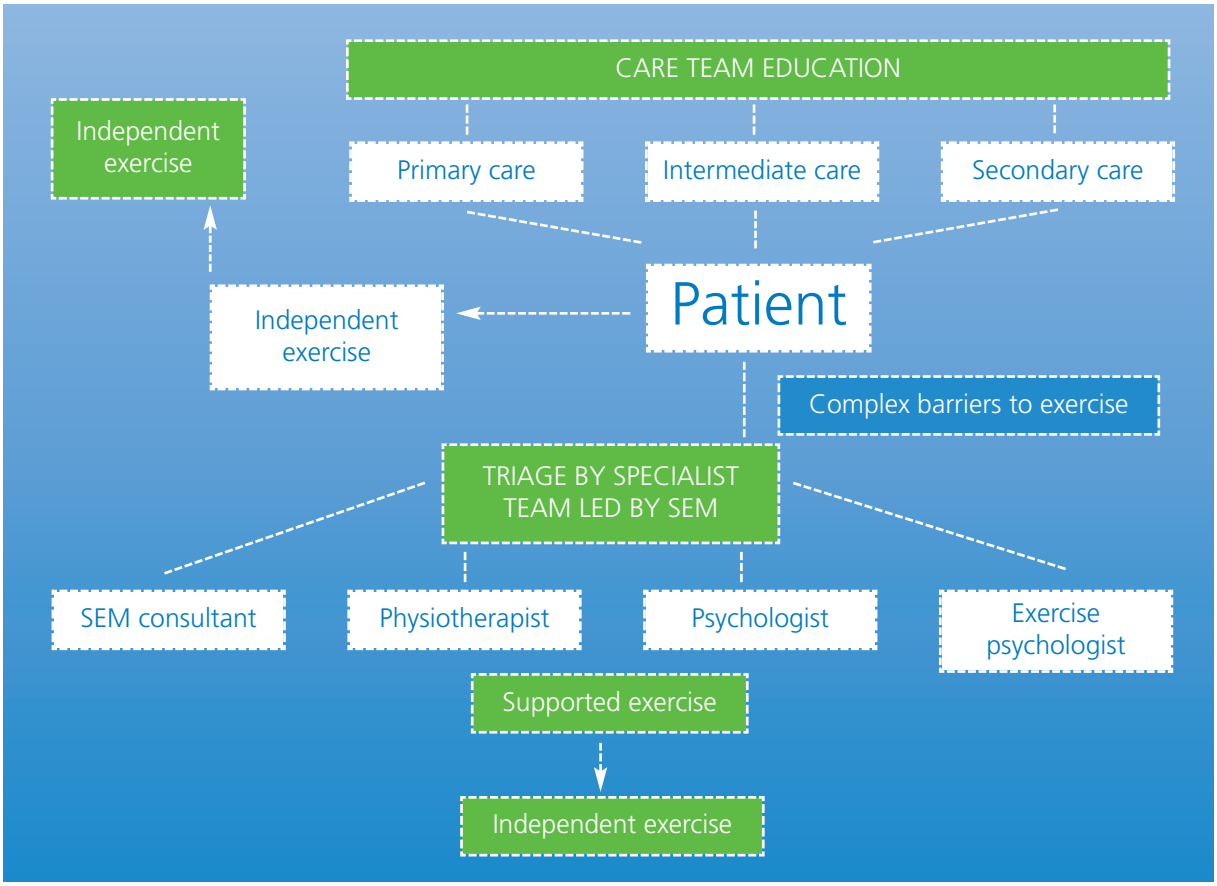
Current service map (Creaney 2009-Fit for the Future)



The Faculty of Sport and Exercise Medicine believe that services would be better delivered in a patient-centred way. Patients could be triaged into appropriate groups depending on their individual barriers (co-morbidity, behavioural stage of change, socio-economic and cultural needs) and on the exercise prescription requirement. In this way exercise prescription could be patient-specific rather than disease-specific and centred on individual physical activity needs. Level of intervention and follow-up could be tailored to the individual.

4. Potential model for physical activity service provision for chronic disease

This approach could potentially address many important barriers to physical activity adherence while providing for a wider group of patients and affording significant economies of scale. Centrally based coordinated patient pathways could utilise local resources effectively including the use of innovative follow-up techniques, buddy schemes, social networking sites etc.



5. The role of exercise prescription in chronic disease. Moore, G, Br J Sports Med 2004;38:6–7

6. Marcus B, Ciccolo J. Using electronic/computer interventions to promote physical activity. Br J Sports Med 2009;43:102-105

2.4: Biological mechanisms to explain the exercise effect

There are emerging, plausible biological mechanisms to explain the profound effect of exercise in a variety of chronic disease. A full literature review is beyond the scope of this paper, however, below are some key papers.

1. The anti-inflammatory effect of exercise. Clin. Sci. (2007) 112, 543-555

2. The Yale Exercise and Survivorship Study. Irwin M et al. Cancer Epidemiol Biomarkers Prev. 2009 January; 18(1): 306–313

Randomized controlled trial of aerobic exercise on insulin and insulin-like growth factors in breast cancer survivors:

3. Colon cancer and physical activity. Calle and Kaaks 2004.

3 – Musculoskeletal health

There are variable service models for MSK health operating within the UK at present. Outcome data from these services is sparse and uncoordinated leading to a lack of robust translational cost-effectiveness data to suggest future directions. There is evidence to suggest that interface services are cost-effective and achieve high levels of patient satisfaction while reducing the burden on orthopaedic services. The structure of these interface services is variable with some being staffed by ESPs, some being supported with GpwSIs and others also having access to specialist care commonly a consultant in Sport and Exercise Medicine. It is the belief of the Faculty of SEM that interface services benefit from the addition of an SEM specialist to support the multidisciplinary team, provide additional interventional and diagnostic services and clinical expertise, to ensure robust clinical governance and lead high quality translational research. There are several such models in existence in the UK and this model is commonly used elsewhere in the world.

3.1: Musculoskeletal interface services

1. CSP. Offering choice in the orthopaedic services
www.csp.org.uk/uploads/documents/csp sep ocos.pdf

This document is a compilation of case studies demonstrating the impact of intermediate multidisciplinary teams on local orthopaedic services. One benefit of the improved patient pathway is an improvement in orthopaedic conversion rate to surgery.

PCT	Conversion rate before	Conversion rate after
New Forest PCT	40%	75%
Somerset Coast PCT	30%	70%
County Durham and Darlington Acute Hospitals NHS Trust	30%	70%

2. Baker R. Randomised controlled trial to compare GP - run orthopaedic clinics based in hospital outpatient departments and general practices. BJGP 2005. 55(521):908-10

This RCT compared outcomes between patients seen by GPwSI in a primary care setting and those seen by GPwSI in secondary care. It showed that there were no differences between the two groups in patient outcome but patients seen in primary care settings generally were more satisfied with their healthcare experience.

3. Evaluation of General Practitioners with Special Interests: Access, Cost Evaluation and Satisfaction with Services. NCCSDOAugust 2005 revised January 2006. RosenR et al

This evaluation looked to establish the impact of general practitioners with special interest (GPwSIs) services on access to specialist care, user satisfaction and costs. It used an observational comparative cohort design, combining quantitative and qualitative methods.

Key findings with regards to MSK service include:

- Significantly higher satisfaction of patients who attended GPSI run service compared to hospital clinic.
- GPwSI patientswere significantly more satisfied with the actual waiting time they experienced.
- Significantly more GPSI patients than hospital patients reported finding it easy to get to their appointment and waited a shorter time once there.

4. Annual Report of the CMO 2008 (pages 33- 39): Pain: Breaking through the barrier.

This chapter of the CMO Annual Report described to size of the problem of chronic pain in the United Kingdom. According to estimates within this report, chronic back pain alone costs the economy £12.3 billion per year and 25% of chronic pain sufferers lose their jobs. This report highlights the need for specialist chronic pain services and the importance of physical activity and psychological interventions in the MDT approach.

3.2: The future of musculoskeletal health

1. The Musculoskeletal Services Framework. A joint responsibility: doing it differently. DoH 2006

The purpose of this document is to support the improvement of services for people with musculoskeletal conditions to ensure that everyone receives a high quality of service. The service framework, which involved a number of stakeholders in its inception, describes best practice for providing MSK services built around evidence and experience, and recommends action for changing practice. Tenets of the document are that support and treatment should be offered as close to the patient home as possible and multidisciplinary interface services are central to the framework acting as a one-stop-shop for assessment, diagnosis, treatment or point of referral.

2. The Bone and Joint Decade - 2010 to 2020

The United Nations, the World Health Organisation and 37 countries proclaimed the years 2000-2010 as the Bone and Joint Decade (BJD). This global initiative is intended to improve the lives of people with MSK disorders and advance understanding and treatment through prevention, education and research. The achievements of the first ten years have been significant hence, to ensure that MSK conditions are among the leading health concerns in the minds and actions of policy makers throughout the world the BJD has renewed its mandate for another 10 years with the vision to "Keep People Moving".

A strategic action plan has been developed with key goals to:

- Reduce the burden and cost of musculoskeletal disorders to individuals, carers and society
- Raise awareness of the growing burden of musculoskeletal disorders on society.

3. European Bone and Joint Health Strategies Project (2005).European action towards better musculoskeletal health: A public health strategy to reduce the burden of musculoskeletal conditions. The Bone and Joint Decade, Lund, Sweden.

4 – Workplace wellness

4.1: Major UK health in the workplace reports

1. MEDTEL report - Dame Carol Black (2008) Dame Carol Black's review of the health of Britain's working age population: Working for a healthier tomorrow. London:TSO

This Review has sought to establish the foundations for a broad consensus around a new vision for health and work in Britain. At the heart of this vision are three principal objectives:

- Prevention of illness and promotion of health and well-being.
- Early intervention for those who develop a health condition.
- An improvement in the health of those out of work – so that everyone with the potential to work has the support they need to do so.

2. Boorman Report, NHS Health and Wellbeing, 2009 www.nhshealthandwellbeing.org/pdfs/NHS%20HWB%20Review%20Interim%20Report%20190809.pdf

The Boorman report sets out a major change agenda for the NHS designed to place staff health and well-being at the heart of its work. The final report addressed the issues raised from the initial interim report in 2009 which detailed the current state of the NHS workforce's health and well-being and made recommendations at local and national level to deliver change. The report identified that while there were good areas of practice, NHS organisations were not giving priority to staff health and well-being and services were often reactive rather than proactive focusing on responding to sickness and ill health. The report concluded that it in order to deliver sustainable, high quality services, NHS organisations must invest in the health of their workforce. Through effective staff engagement and ensuring staff have productive and rewarding jobs, it is possible to reduce sickness absence and increase productivity.

3. Kreis, J. &Bodeker, W. (2004). Health related and economic benefits of workplace health promotion and prevention. Summary of scientific evidence. BKK Bundesverband: Essen, Germany

4. Pronk NP et al The association between work performance and physical activity, cardiorespiratory fitness, and obesity. J Occup Environ Med. 2004 Jan;46(1):19-25

5. PwC Building the case for wellness (2008) www.workingforhealth.gov.uk

4.2: Examples of good practice in workplace wellness

1. Heart of England NHS Trust. NHS sport and physical activity.

2. www.qactive.co.uk. Promoting health and wellbeing amoungst staff at the Queens Medical Centre in Nottingham

5 – Education

1. Joint Health Surveys Unit (National Centre for Social Research and UCL Department of Epidemiology and Public Health). Health Survey for England 2008: Physical Activity and Fitness. The NHS Information Centre, Leeds, UK, 2009. www.ic.nhs.uk/pubs/hse08physicalactivity (accessed Jun 2010).

2. www.exerciseismedicine.org. ACSM

3. Garry JP, Diamond JJ, Whitley TW. Physical activity curricula in medical schools. Acad Med 2002;77:818–20

4. Batt ME and Tanji J. The future of Chronic Disease Management and the role of SEM physicians. Clin J Sports Med 21;1, Jan 2011

5. Exercise, sports and musculoskeletal medicine in UK medical school curricula: a survey F Oluwajana, C Rufford, D Morrissey Br J Sports Med 2011;45:e1

6. Lobelo F. Physical activity habits of doctors and medical students influence their counselling practices. Br J Sports Med 2009;43:89-92

7. Example UK based Diploma and MSc Courses for SEM www.bath.ac.uk/health/sem

www.pgstudy.nottingham.ac.uk/.../sports-and-exercise-medicine-masters-msc, www.ucl.ac.uk/surgicalscience/courses/sports_exercise

8. Medicolegal neglect. The case for physical activity promotion in primary care. Weiler R, Feldschreiber P, Stamatakis E. Br J Sports Med (2011) doi:10.1136/bjsm.2011.084186

6 – Research

1. Framework for design and evaluation of complex interventions to improve health. Cambell et al BMJ