Facoltà di Medicina e Chirurgia dell'Università di Firenze

Corso di Laurea in Scienze Motorie

Corso di Medicina dello Sport

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www.sportshealthcare.eu

The role of exercise prescription in chronic disease

G E Moore

Appropriate exercise should be included in the treatment of all patients

"In a word, all parts of the body which were made for active use, if moderately used and exercised at the labor to which they are habituated, become healthy, increase in bulk, and bear their age well, but when not used, and when left without exercise, they become diseased, their growth is arrested, and they soon become old."
Hyppocrates Medicine's view of exercise did not progress much in the subsequent two millenia, and exercise was primarily viewed as an activity for healthy people, but not for the chronically ill.
The use of exercise as a medical treatment is an old concept, but one that did not start gaining acceptance until the 20th century.
Today, exercise scientists are exploring the limits of exercise as a therapy—of exercise as a medicine.

Br J Sports Med 2004;38:6–7.

The first recorded anecdote of exercise as a treatment for heart disease is thought to be from William Heberden,who wrote of a man with angina pectoris in 1772: ‘‘I knew of one who set himself the task of sawing wood forhalf an hour every day, and was nearly cured’’.Ironically, Heberden did not know that angina pectoris is a cardiac disorder.‘‘

Physicians of the 1800s were interestedin the role of exercise in maintenance of health, but the modern notion of exercise as a medical treatmentis thought to have originated with R Tait McKenzie. McKenzie perceived exercise as a technique to rehabilitate people with disabling injuries’’

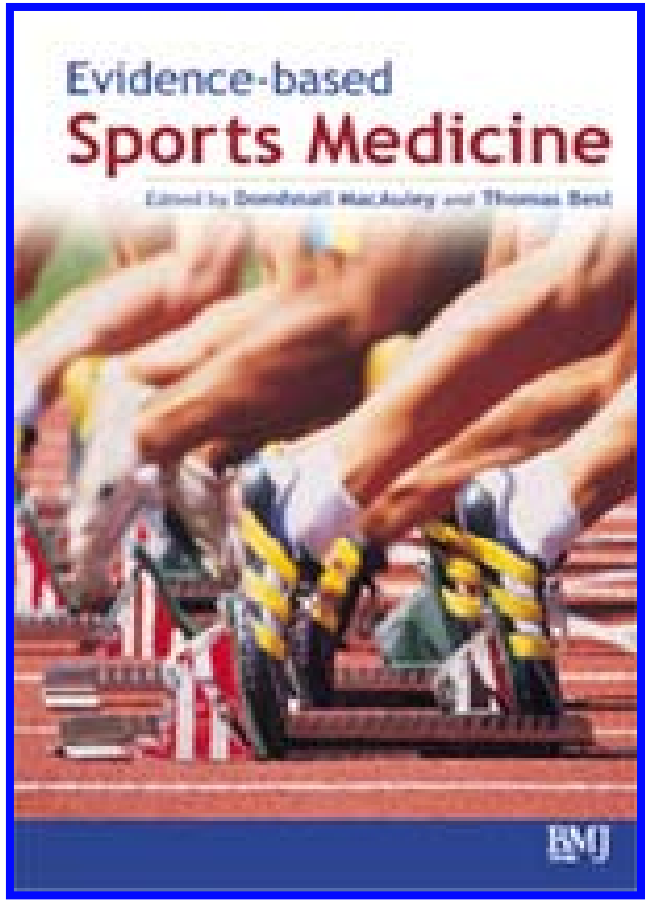
William Osler, in the 1909 edition of The principles and practice of medicine, wrote that bed rest and baths at spas like Bad Nauheim were the optimal treatment for heart disease.

In 1939, Paul Dudley White, the first cardiology professor at Harvard Medical School, co-authored a manuscript showing cardiac dilatation through aneurysm formation after myocardial infarction, and this was used as an argument against exercise after myocardial infarction.

By 1958, Dr White had changed his views and coauthored a textbook on cardiac rehabilitation in which low level exercise was promoted.Then in 1968, the concept of bed rest was finally put to rest by the landmark paper of Bengt Saltin et al. In 60 years, physicians had learned that exercise was useful in rehabilitation of people with both musculoskeletal injuries and cardiovascular disease.

‘‘Our current understanding of exercise prescription is limited for most chronic diseases’’

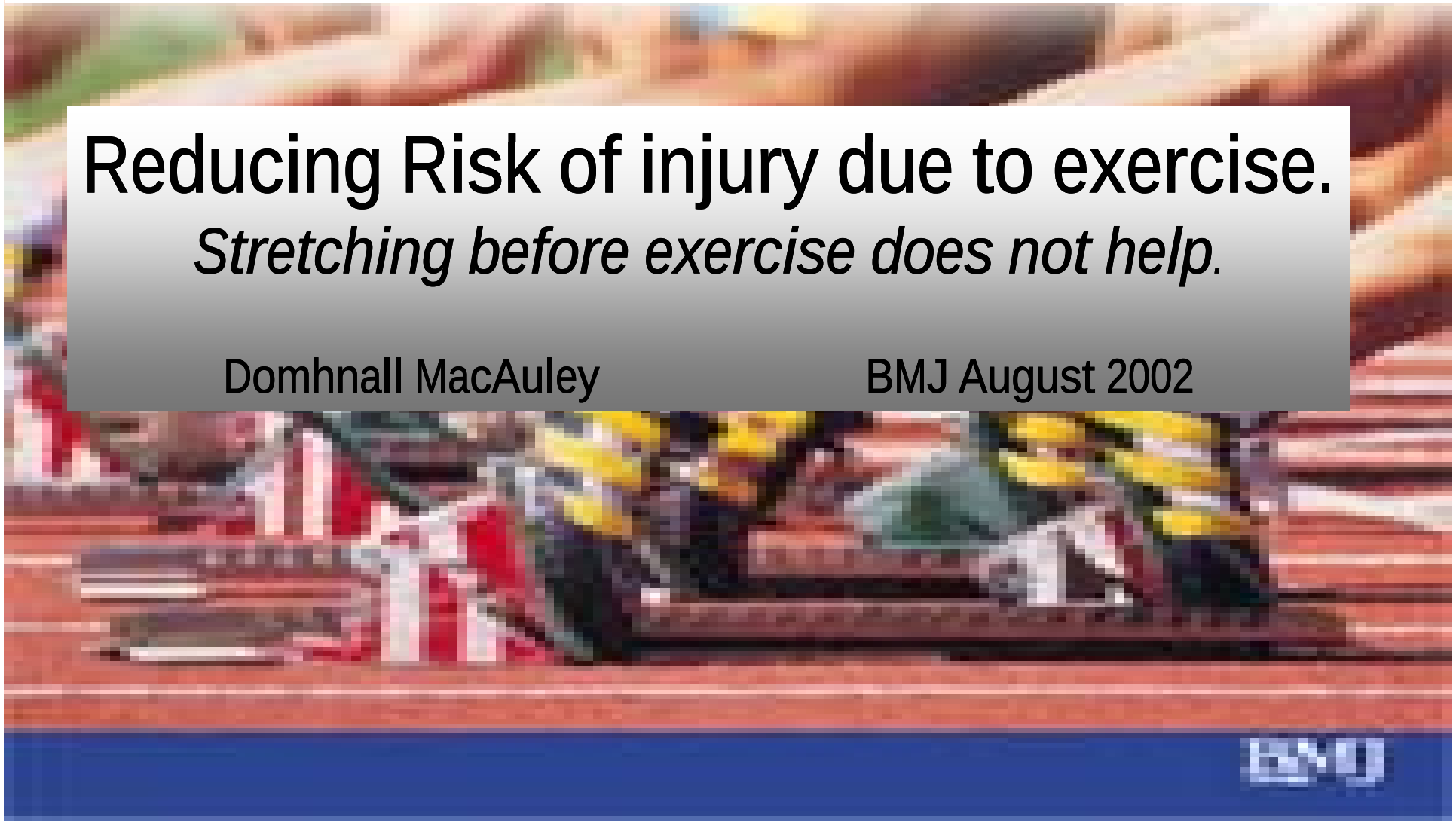
Evidence-based Sport Medicine



D.MacAuley,T.B Best 2002

- Sport is big business,high profile entertainement with increasing demands of sports physicians. But,is sports medicine science or showbusiness?
- The new generation of sports physicians will change the face of sports medicine simply by asking for research evidence.

Evidence-based
Sport Medicine



Reducing Risk of injury due to exercise.

Stretching before exercise does not help.

Domhnall MacAuley BMJ August 2002

La pratica delle attività fisico-sportive oggi

L'area totale dei cittadini attivi stimata dall'Istat- circa 36 milioni nel 1999 - si è ridotta nel 2003 a circa 32 milioni e mezzo, mentre l'area della sedentarietà è salita da 19,5 a 23 milioni (sugli abitanti da 3 anni in su).

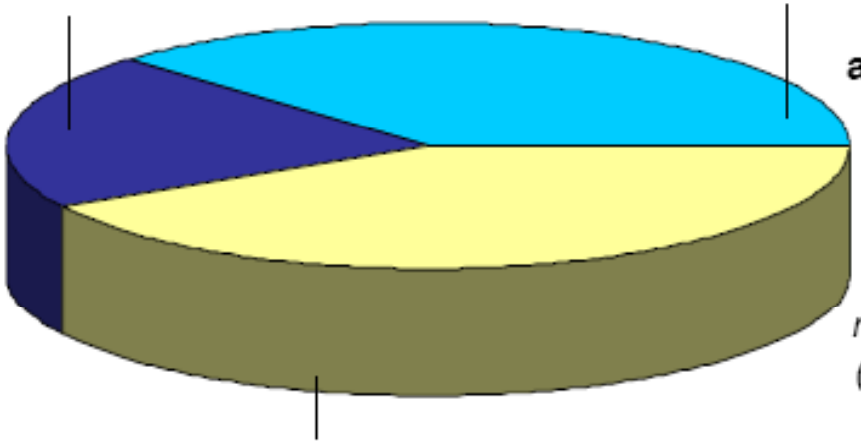
Italia Coni

3. L'attività fisico-sportiva degli italiani nel 2003

Dati Istat 2003 su 55,5 milioni di cittadini di 3 anni e più

pratica sportiva con continuità:
circa 11 milioni e mezzo (20,8 %)

in aumento rispetto al 1999 (2,7% in più)



attività sportive saltuarie/occasionali o qualche attività fisica:
circa 21 milioni (37,6 %)

in diminuzione rispetto al 1999 (9,1% in meno)

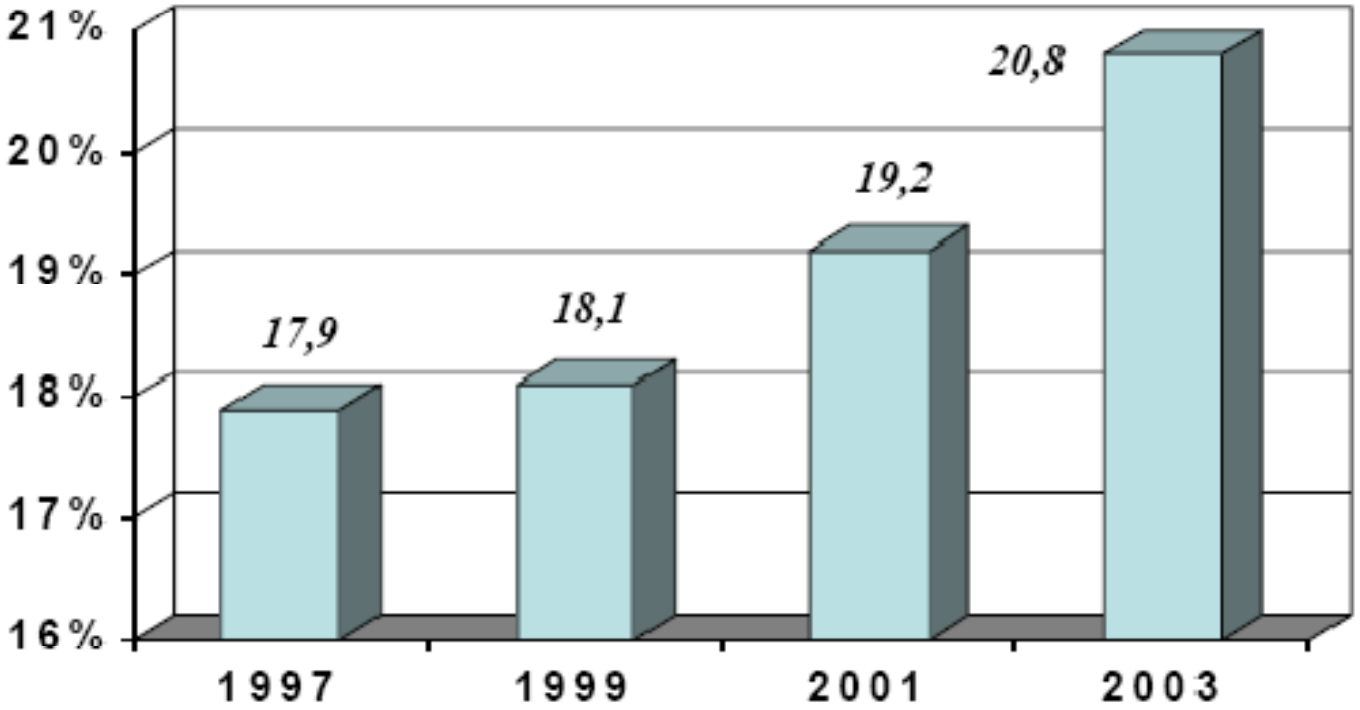
nessuna attività fisica nel tempo libero,
sedentarietà: circa 23 milioni (41,6 %)

in aumento rispetto al 1999 (6,4% in più)

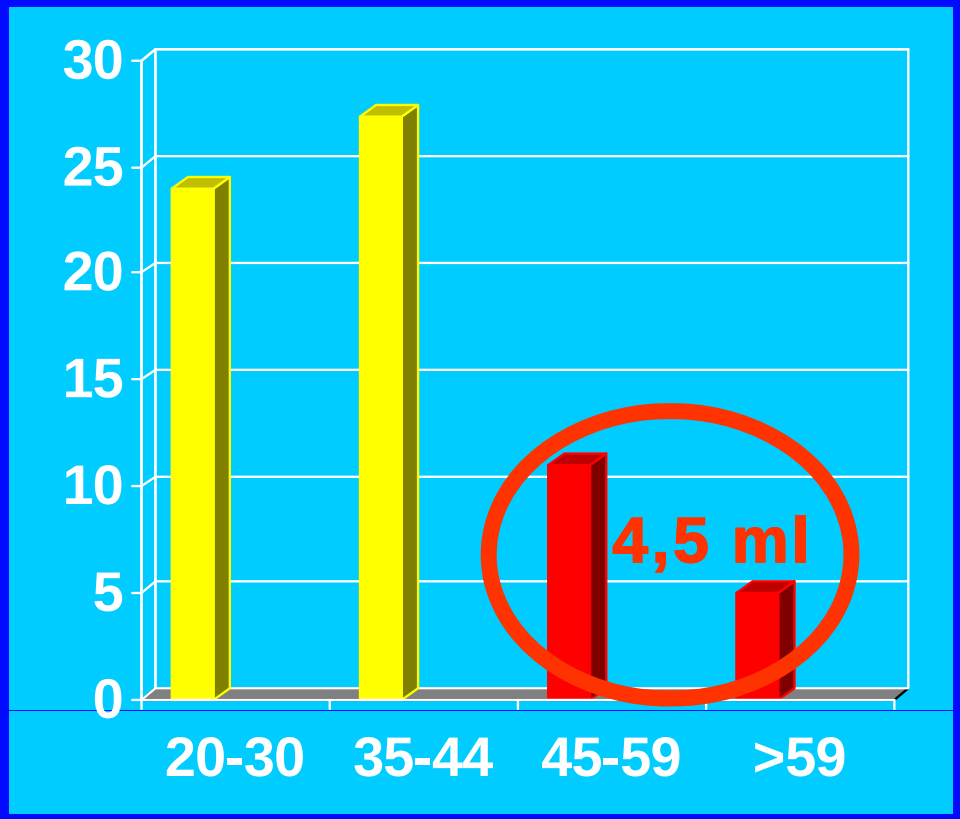
Italia Coni

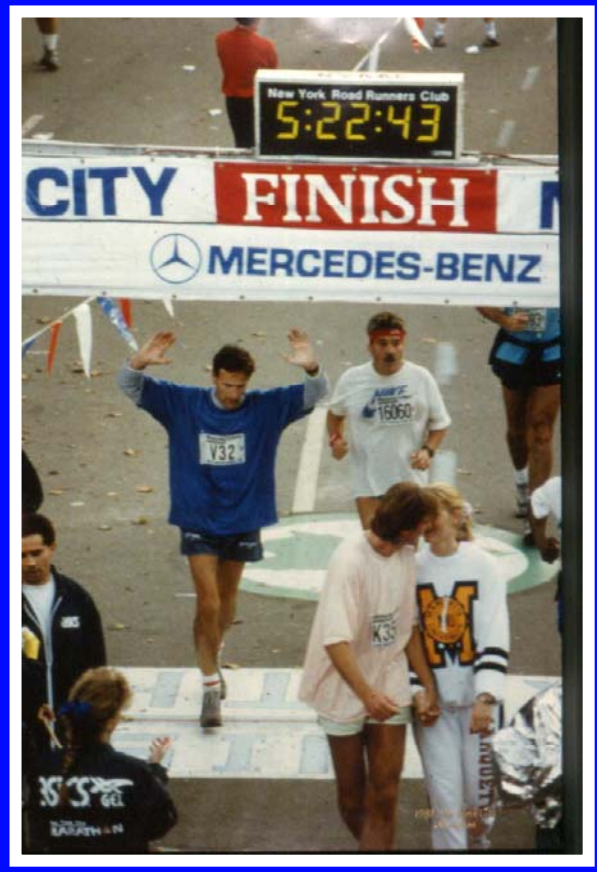
2. Andamento della pratica sportiva continuativa fra il 1997 e il 2003

Dati Istat 2003 su 55,5 milioni di cittadini di 3 anni e più



Aging (%)and Physical Activity in Italy





(Istat 2005)

Exercise

is physical activity that is planned or structured. It involves repetitive bodily movement done to improve or maintain one or more of the components of physical fitness.

Physical fitness

Physical fitness is a set of attributes a person has in regards to a person's ability to perform physical activities that require aerobic fitness, endurance, strength, or flexibility and is determined by a combination of regular activity and genetically inherited ability.

Cardiorespiratory fitness

Cardiorespiratory endurance is the ability of the body's circulatory and respiratory systems to supply fuel and oxygen during sustained physical activity.

Inactivity

Inactivity is not engaging in any regular pattern of physical activity beyond daily functioning.

Physical activity

Physical activity is any bodily movement produced by skeletal muscles that result in an expenditure of energy.

Household physical activity

Household physical activity includes (but is not limited to) activities such as sweeping floors, scrubbing, washing windows, and raking the lawn.

Occupational physical activity

Occupational physical activity is completed regularly as part of one's job. It includes activities such as walking, hauling, lifting, pushing, carpentry, shoveling, and packing boxes.

Regular physical activity

A pattern of physical activity is regular if activities are performed most days of the week, preferably daily;

5 or more days of the week if moderate-intensity activities (in bouts of at least 10 minutes for a total of at least 30 minutes per day); or

3 or more days of the week if vigorous-intensity activities (for at least 20-60 minutes per session).

Note: These are minimum recommendations, greater health outcomes can be achieved by doing additional types activities and/or increasing time spent doing activities.

Leisure-time physical activity

Leisure-time physical activity is exercise, sports, recreation, or hobbies that are not associated with activities as part of one's regular job duties, household, or transportation.

Transportation physical activity

Transportation physical activity is walking, biking or wheeling (for wheelchair users), or similar activities to and from places such as: work, school, place of worship, and stores.

Weight-bearing physical activity

Any physical activity that imparts a load or impact (such as jumping or skipping) on the skeleton.

Moderate-intensity physical activity

Moderate-intensity physical activity refers to a level of effort in which a person should experience:

Some increase in breathing or heart rate a "perceived exertion" of 11 to 14 on the Borg scale

the effort a healthy individual might expend while walking briskly, mowing the lawn, dancing, swimming, or bicycling on level terrain, for example.

3 to 6 metabolic equivalents (METs); or any activity that burns 3.5 to 7 Calories per minute (kcal/min)

Vigorous-intensity physical activity

Vigorous-intensity physical activity may be intense enough to represent a substantial challenge to an individual and refers to a level of effort in which a person should experience:

large increase in breathing or heart rat (conversation is difficult or “broken”) a "perceived exertion" of 15 or greater on the Borg scale;

the effort a healthy individual might expend while jogging, mowing the lawn with a nonmotorized pushmower, participating in high-impact aerobic dancing, swimming continuous laps, or bicycling uphill, carrying more than 25 lbs up a flight of stairs, standing or walking with more than 50 lbs for example.

greater than 6 metabolic equivalents (METs); or

any activity that burns more than 7 kcal/ min

Borg Rating of Perceived Exertion (RPE) Scale

6 No exertion at all
7
Extremely light (7.5)
8
9 Very light
10
11 Light
12
13 Somewhat hard
14
15 Hard (heavy)
16
17 Very hard
18
19 Extremely hard
20 Maximal exertion

9 corresponds to "very light" exercise. For a healthy person, it is like walking slowly at his or her own pace for some minutes

13 on the scale is "somewhat hard" exercise, but it still feels OK to continue.

17 "very hard" is very strenuous. A healthy person can still go on, but he or she really has to push him- or herself. It feels very heavy, and the person is very tired.

19 on the scale is an extremely strenuous exercise level. For most people this is the most strenuous exercise they have ever experienced.

Generically speaking, any exercise prescription resembles a drug prescription:
Exercise A, taken N times daily, for X duration of weeks/months/years.

The exercise type and dose are chosen by the person's individual needs, goals, and ability level;the frequency and intensity of each session are chosen by the person's intrinsic endurance and ability to recover; the progression and duration of the programme is determined by the person's intermediate and long term goals.

Adverse effects are related to the type of exercise-for example, delayed onset muscle soreness-and the specific chronic disease-for example, chest pain in angina pectoris, joint pain in arthritis, fatigue in fibromyalgia.

Calorie

A measure of energy from food. (3,500 kilocalories of food energy = 1 pound of body weight). Also the amount of heat required to raise the temperature of 1 gram of water 1° C (1000 calories = 1 kilocalorie). An interesting fact: When we see "Calories" on a food label it is actually measuring kilocalories

Kilocalorie

The amount of heat required to raise the temperature of 1 kg of water 1° C. Kilocalorie is the ordinary calorie discussed in food or exercise energy-expenditure tables and food labels.

Insegnamento della Medicina dello Sport nelle Scienze Motorie

Obbiettivi dell'insegnamento

A. lo studente dovrà conoscere i concetti generali della fisiologia dell'esercizio,della fisiopatologia delle malattie epidemiologicamente più importanti quali le malattie coronariche, l'ipertensione, il diabete, le allergopatie,le connettivopatie e malattie congenite in rapporto allo svolgimento di attività fisica.

B. In particolare la trattazione dovrà tener conto dei rapporti che l'esercizio fisico esercita su queste patologie provocando a seconda delle condizioni e della fase della malattia un miglioramento od un danno.

C. Saranno inoltre argomento di trattazione gli effetti dell'esercizio fisico nei portatori di handicap,nell'anziano apparentemente sano, nella donna in gravidanza e menopausa nell'adolescente.

Insegnamento della Medicina dello Sport nelle Scienze Motorie

1. Effetti dell'esercizio fisico acuto e cronico sull'apparato cardiovascolare ed altri apparati
2. Effetti dell'esercizio fisico nei giovani
3. Effetti dell'esercizio fisico negli anziani
4. Effetti dell'esercizio fisico nelle donne
5. Esercizio fisico e gravidanza
6. Bad ed overtraining
7. Rapporti fra esercizio fisico e cardiopatia ischemica.
8. Rapporti fra esercizio fisico e ipertensione.
9. Effetti dell'esercizio fisico nella obesità e dismetabolismi

10 Infiammazione e patologia muscolotendinea

11 Rapporti fra esercizio fisico e malattie allergiche

12 Rapporti fra esercizio fisico e malattie di carattere internistico

13 Attività sportiva e morte improvvisa

14 Attività sportiva in ambienti particolari

15 Gastroenterologia ed attività sportiva

16 Effetti dell'esercizio fisico nei portatori di handicap.

E' prevista inoltra una trattazione in sintonia con i farmacologi,del doping delle sostanze dopanti; In questa ottica il docente dovrà fornire allo studente gli elementi per la valutazione di questi soggetti nel contesto dell'attività motoria

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Health Fitness Certifications

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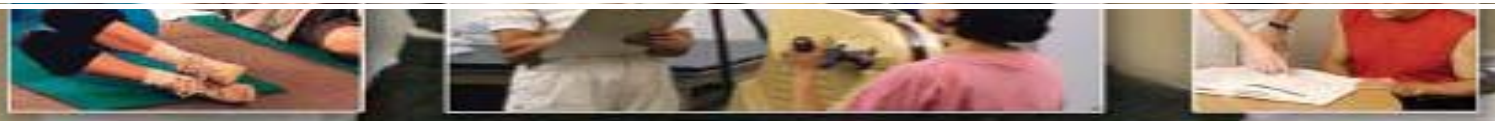
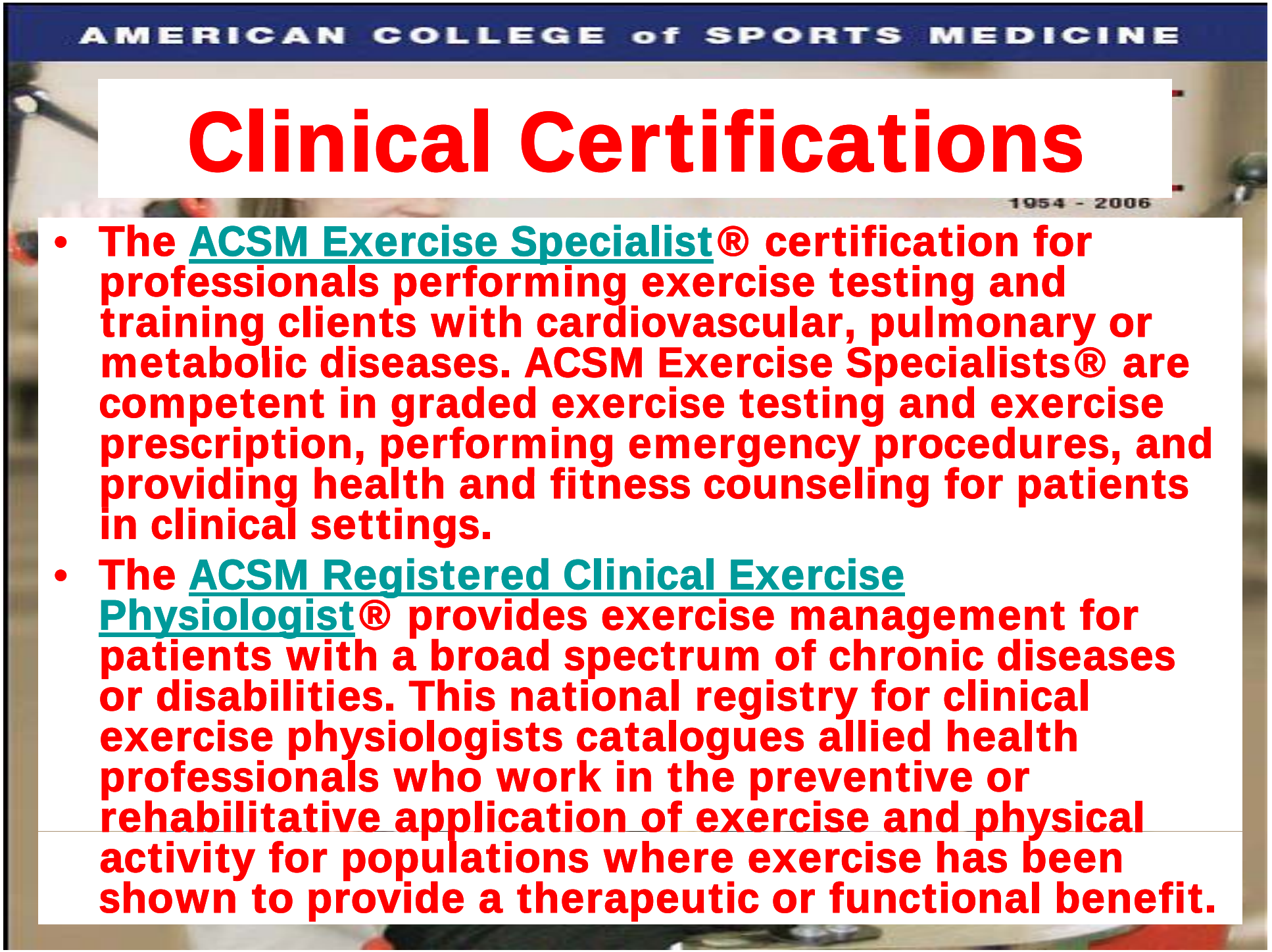
- The ACSM Certified Personal Trainer SM is designed for a fitness professional involved in developing and implementing an individualized approach to exercise leadership in healthy populations and/or those individuals with medical clearance to exercise.
- The ACSM Health/Fitness Instructor® is designed primarily for leaders of preventive health programs in corporate, commercial, and community settings aimed at low- to moderate- risk individuals or persons with controlled diseases, such as hypertension, obesity or asthma.





Clinical Certifications

- The ACSM Exercise Specialist® certification for professionals performing exercise testing and training clients with cardiovascular, pulmonary or metabolic diseases. ACSM Exercise Specialists® are competent in graded exercise testing and exercise prescription, performing emergency procedures, and providing health and fitness counseling for patients in clinical settings.
- The ACSM Registered Clinical Exercise Physiologist® provides exercise management for patients with a broad spectrum of chronic diseases or disabilities. This national registry for clinical exercise physiologists catalogues allied health professionals who work in the preventive or rehabilitative application of exercise and physical activity for populations where exercise has been shown to provide a therapeutic or functional benefit.

ACSM certified Personal Trainer℠

Exam Blueprint **KSAs Competency Area**	*percentages are approximate*
Exercise Physiology and Related Exercise Science	24%
Exercise Prescription (Training) and Programming	28%
Human Behavior	4%
Health Appraisal and Fitness Exercise Testing	13%
Safety, Injury Prevention and Emergency Procedures	8%
Nutrition and Weight Management	9%
Program Administration, Quality Assurance, and Outcome Assessment	4%
Clinical and Medical Considerations	10%

ACSM Health/Fitness Instructor®

Exam Blueprint **KSAs Competency Area**	*percentages are approximate*
Exercise Physiology and Related Exercise Science	23%
Exercise Prescription (Training) and Programming	31%
Human Behavior	4%
Health Appraisal and Fitness Exercise Testing	12%
Safety, Injury Prevention and Emergency Procedures	7%
Nutrition and Weight Management	8%
Program Administration, Quality Assurance, and Outcome Assessment	8%
Pathophysiology and Risk Factors	5%
Electrocardiography and Diagnostic Techniques	1%
Medical and Surgical Management	1%

ACSM Exercise Specialist®

Exam Blueprint KSAs Competency Area	*percentages are approximate*
Exercise Physiology and Related Exercise Science	10%
Exercise Prescription (Training) and Programming	19%
Human Behavior	5%
Health Appraisal and Fitness Exercise Testing	26%
Safety, Injury Prevention and Emergency Procedures	5%
Nutrition and Weight Management	2%
Patient Management and Medications	2%
Program Administration, Quality Assurance, and Outcome Assessment	2%
Pathophysiology and Risk Factors	10%
Electrocardiography and Diagnostic Techniques	17%
Medical and Surgical Management	6%

ACSM Registered Clinical Exercise Physiologist®

Exam Blueprint **KSAs Competency Area**	*percentages are approximate*
Exercise Physiology and Related Exercise Science	19%
Exercise Prescription and Programming	21%
Human Behavior	5%
Health Appraisal and Fitness Exercise Testing	25%
Safety, Injury Prevention and Emergency Procedures	4%
Medical and Surgical Management	13%
Program Administration, Quality Assurance, and Outcome Assessment	4%
Pathophysiology and Risk Factors	9%

Corso di Laurea in Scienze Motorie

Il Team di Medicina dello Sport

Il medico,l'allenatore,il preparatore atletico,gli amici,la famiglia dell'atleta.

AMS

Il Team di Medicina dello Sport

1. Quale è il ruolo del medico di squadra?
2. Dove svolge l'attività il preparatore atletico?
3. Quale è il ruolo del preparatore atletico?
4. Quale bagaglio culturale deve avere?
5. Quali sono le discipline biomediche che deve conoscere?
6. Come si colloca il PA nel team medico?
7. Quali sono gli altri compiti del PA?

Il Team di Medicina dello Sport
Il Medico di Squadra

- **Quale è il ruolo del medico di squadra?**

Il MS deve essere attento ai bisogni fisici,emozionali e spirituali dell'atleta nel contesto della disciplina sportiva e del team.

Indipendentemente dal tipo di allenamento il medico deve essere un generalista.

Se il MS è uno specialista il suo successo dipende non dalle sue capacità tecniche,ma dall'abilità di conciliare le necessità mediche dell'atleta in rapporto con l'attività sportiva praticata.

Il Team di Medicina dello Sport
Il preparatore atletico

- **Dove svolge la sua attività il preparatore atletico?**

- **Il preparatore atletico può svolgere il suo lavoro in vari ambiti professionali: nella scuola,Università, ambito sanitario,Sport professionistici ed amatoriali**

Il Team di Medicina dello Sport
Il preparatore atletico

A. Quale è il ruolo del preparatore atletico?

1. PA è responsabile della prevenzione,il trattamento di emergenza ,la prima cura,la valutazione e la riabilitazione dell'atleta di cui è responsabile.
2. PA è spesso consultato dall'allenatore e dal suo staff sullo stato di forma e sul programma di nutrizione.
3. PA è il tramite fra il medico,atleti,allenatore e altri professionisti dell'area medica.

Il Team di Medicina dello Sport
Il preparatore atletico

- **Quali sono le basi culturali che deve avere il PA?**

1. **Prevenzione delle lesioni sportive**
2. **Valutazione**
3. **Trattamento**
4. **Riabilitazione**
5. **Organizzazione e amministrazione**
6. **Consulenza ed educazione**

Il Team di Medicina dello Sport
Il preparatore atletico

- **Quali sono i corsi di studio che deve frequentare?**

1. **Anatomia umana**
2. **Fisiologia umana**
3. **Fisiologia dell'esercizio**
4. **Cura della persona**
5. **Chinesiologia e biomeccanica**
6. **Le basi dell'allenamento atletico**
7. **L'allenamento atletico avanzato**

Il Team di Medicina dello Sport
Il preparatore atletico

- **Come si colloca il PA nel team medico?**

Il PA provvede alla iniziale soccorso all'atleta infortunato.La sua preparazione lo rende capace di identificare le lesioni e valutare gli effetti sull'atleta ,iniziare le prime cure ,e affidare l'atleta per gli appropriati e successivi provvedimenti terapeutici.

Il Team di Medicina dello Sport
Il preparatore atletico

- **Quali sono gli altri compiti del PA?**

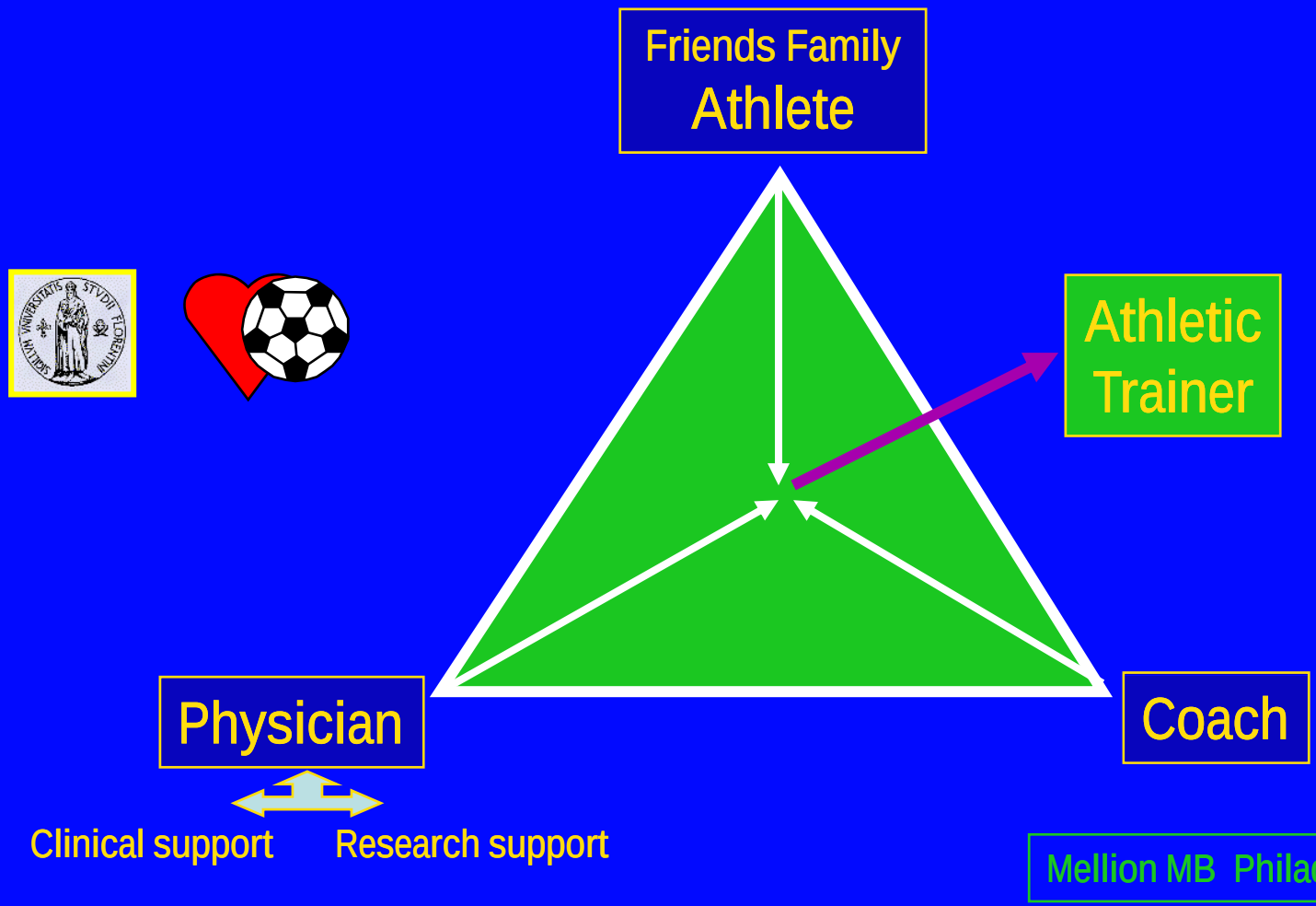
Il preparatore atletico è in contatto giornalmente con l'atleta. Il PA deve essere in grado di comprendere le richieste che lo sport ha sull'atleta . Questa comprensione permette al PA di programmare i vari aspetti connessi alla flessibiltà,forza, propriocezione in funzione dello sport e dell'individuo.

Il Team di Medicina dello Sport

Il preparatore atletico

1. Il preparatore atletico occupa un posto unico nel triangolo del team in Medicina dello Sport.
2. Il preparatore atletico è un terapista ed un consigliere per l'atleta,"advisor" e un amico per l'allenatore,un extra paio di occhi e orecchi per il medico sportivo.
3. Ogni programma atletico a livello universitario e post universitario deve avere un PA certificato.
4. Il preparatore atletico si occupa dell'atleta nel suo insieme.

The Sport Medicine Team



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