PAMAP
Physical Activity Monitoring for Aging People

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PAMAP: Physical Activity Monitoring for Aging People

• Balanced physical activities are essential for “well-aging”

Report on Physical Activity and Older Americans by US Department of Health and Human Services (HHS) - 2002

Established Benefit
• Lower overall mortality.
• Lower risk of coronary heart disease.
• Lower risk of colon cancer.
• Lower risk of diabetes.
• Lower risk of developing high blood pressure.
• Lower risk of obesity.
• Improved mood and relief of symptoms of depression.
• Improved quality of life and improved functioning.
• Improved function in persons with arthritis.
• Lower risk of falls and injury.

Supposed Benefit
• Lower risk of breast cancer.
• Prevention of bone loss and fracture after the menopause.
• Lower risk of developing depression.
• Improved quality of sleep.
Physical Activity Statistics

Fig. 1. Proportion of adults (aged 15 years or over) in the EU classified as sufficiently active, 2002

- Estimated cost of physical inactivity about €150–300 per citizen per year (WHO Europe report 2006)

Source: Sjöström et al. (8).
Physical Activity Statistics

Aging = Less Physical Activity

Prevalence of no leisure-time physical activity

PERCENT

AGE GROUP

18-29 30-44 45-64 65-74 75+

Healthy People 2010

target: 20%

Report The State of Aging and Health in America 2007
Centers for Disease Control and Prevention - U.S. Department of Health and Human Services
PAMAP: Physical Activity Monitoring for Aging People

• The basic idea
  – On-body sensor network
    MEMS: accelerometers, gyroscopes, ...
  – Bio-mechanical model of the body
  – Musculoskeletal motion analysis
  – To infer the muscle activity

• Then
  – To compare actual and targeted user’s physical activity
  – To share information with friends, family or clinicians
PAMAP: System

At Home - TV Station
- Musculoskeletal activity analysis
- Information sharing
- Tele-consultation

Medical Supervision
- Remote data access
- Tele-consultation

Mobile Platform
- Data recording
- Local information processing
- Monitoring

Information sharing – Social communication
- Video conferencing
- Information sharing

INTERNET
Challenges: Diversity of physical activities

Aminian 2004
Challenges: Usability and Acceptance

• Record and feed back system
• User interface
• Clinical staff interface
Challenges: technical development

• First sensors are available

• Early Demonstrator
  – Global activity through a single sensor in the shoe
  – Simple bio-mechanical model of the leg
  – First (simple) tests in January 2010
Thank you!

More under:

www.pamap.org

and

http://av.dfki.de