

Friday 17th August 2012 Day Theme: Cardiovascular and Respiratory Conditions

Plenary Keynotes

PHYSICAL ACTIVITY, CARDIOVASCULAR FUNCTION AND HEALTH

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In the past two decades, the mortality rate from cardiovascular disease (CVD) in many Westernised countries has been halved. Yet the number of people living with the burden of CVD has not changed and is showing signs of increasing. With increased survival rates, coupled with an ageing population, the management of CVD needs to be delivered in a manner to prevent unnecessary costly hospital re-admissions for both acute coronary events and heart failure. In addition to exercise helping to reduce or manage bio-medical risk, it is increasingly playing a vital role in sustaining quality of life and prevention of co-morbid disability that often transpires either coincidentally or as a result of acute cardiovascular events. This presentation aims to highlight the vital role that physical activity and exercise play in the physical, social, and psychological elements of chronic CVD management that is increasingly prevalent in the Western World's ageing population.

SEDENTARY BEHAVIOUR AND OLDER PEOPLE: NEW INSIGHTS

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As people age, most become physically less active. Health promotion initiatives generally focus on moderate-to-vigorous physical activity or specific forms of exercising for health. However, older people can also spend a great deal of their time sitting. New evidence points to too much sitting as a distinct health risk, which is additional to the more well-known deleterious consequences of too little physical activity. This presentation will provide an overview of what is known about how too much sitting can be bad for health; what is known about how much sitting older people do; why prolonged sitting is so common; and, the feasibility and likely benefits of reducing and breaking up prolonged sitting time. Findings from recent research in Australia will be highlighted, with suggestions about the type of beneficial changes that older adults might make to their patterns of time spent sitting and being physically active. However, changing sitting time is not simply a matter of discretionary individual choice and personal initiative. Serious consideration also needs to be given to

the environmental and policy initiatives that are most relevant for older adults and to the advocacy strategies that are needed.

Symposia

PERSISTENT PAIN IN OLDER ADULTS: A BARRIER TO ACTIVE AGEING.

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Many older people experience persistent pain, which, if poorly managed, can reduce their physical activity levels. This seminar will address the extent, nature, and impact of the problem. Interventions for managing persistent pain, tailored to older adults and targeted at increasing physical activity, will also be discussed.

Chronic musculoskeletal pain contributes to mobility decline and disability in an older population: The MOBILIZE Boston Study.

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Introduction: Chronic musculoskeletal pain is associated with mobility limitations and disability but few studies have examined the disabling impact of chronic pain over time in older adults. **Aims:** The purpose of this study was to examine the relationship between chronic pain and risk for onset or worsening of mobility difficulty and ADL and IADL disability in an older population. **Methods:** The MOBILIZE Boston Study, a population-based longitudinal study, enrolled 765 community-living adults aged >70y. Participants were assessed at baseline and 18 months. Chronic pain was measured using a 13-item joint pain assessment and the Brief Pain Inventory (BPI). Disability in mobility (walking and stair climbing), activities of daily living (ADL), and instrumental ADL (IADL) was defined as having a lot of difficulty or inability in these activities. We used multivariable logistic regression models to determine the relationship between baseline pain and subsequent disability. **Results:** At baseline, 64% of participants had chronic musculoskeletal pain. While 8% of persons without pain had mobility difficulty, 26% of those who had multisite pain and 33% of those with widespread pain had mobility disability. The onset of new or worsening disability at 18-months was consistently associated with more sites of pain and more severe pain at baseline. After multivariable adjustment for sociodemographics, chronic conditions, and medications, the relative risk for developing new or worsening mobility disability was 2.33 (95%CI 1.36-3.98) for those with widespread pain and 1.99 (1.22-3.24) for those with multisite pain, compared to persons with no pain. Similar associations were observed for ADL and IADL disability. **Discussion:** In conclusion, chronic pain distribution and severity were consistently associated with increased risk for new or worsening disability. Greater

attention to prevention and management of chronic pain may reduce disability in the older population. **Keywords:** Pain; Musculoskeletal; Mobility; Disability.

Physiotherapy and occupational therapy students' likelihood to recommend physical activity for managing persistent low back pain: Is an older person likely to be advised differently than a younger person?

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Introduction: Older adults with persistent low back pain (LBP) may receive sub-optimal management due to the ageist attitudes of health care professionals (HCPs). **Aims:** The aim of this study was to compare HCP student's consistency with physical activity guidelines for an older person with LBP to a younger person with LBP. **Method:** UK Physiotherapy and Occupational therapy students randomly received an online vignette of a 40 year-old (younger vignette) [n = 38] or 70 year-old (older vignette) [n = 39] patient with persistent LBP. Other than the patient age, vignettes were identical. The participants reported how they would advise that patient about work, exercise, daily activities, and bed rest. **Results:** There were no significant difference in overall desirable physical activity recommendations between the younger and older vignette [63% vs. 59%; OR(95%CI) = 1.27(0.45-3.55, p = 0.65)] or for of the sub areas of work [90% vs. 82%; OR(95%CI) = 2.62(0.55-12.50, p = 0.23], exercise [68% vs. 72%; OR(95%CI) = 0.86(0.29-2.59, p = 0.79], daily activities [97% vs. 82%; OR(95%CI) = 12.96(0.97-173.75, p = 0.05] and bed rest [97% vs. 95%; OR(95%CI) = 1.50(0.11-20.75, p = 0.76)]. There were very few inappropriate recommendations for daily activities and bed rest which resulted in wide 95% confidence intervals, making it difficult to be conclusive about these areas of recommendation. **Discussion:** This study found little evidence of negative attitudes towards physical activity promotion for older adults amongst student Physiotherapists and Occupational therapists in the UK, contrary to that reported within the literature for qualified HCPs. This suggests ageists attitudes towards physical activity in older adults with chronic pain are not developed during HCP training. Post registration education may be where anti-ageist attitudes need be addressed. **Keywords:** Pain; Physical Activity; Professionals; Treatment.

The impact of chronic musculoskeletal pain on physical activity in older adults: Implications for self-management

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Introduction: Many adults live with chronic pain to the detriment of their health and well-being. Although chronic pain is not a direct function of age, it is a particular problem for many older people. Physical activity can be particularly affected, which can in turn lead to subsequent problems with fitness, function, and the person's ability to manage their condition. Increasing physical activity is recommended as a strategy to improve self-management of

chronic pain and, not surprisingly, such efforts meet imposing barriers. These issues are being investigated under the EOPIC study and related work. EOPIC stands for Engaging with Older People and their carers to develop Interventions for the self-management of chronic pain. This is a collaborative study funded by the Medical Research Council Lifelong Health and Wellbeing programme. **Aims:** To explore the relationship between physical activity, pain and self-management of Chronic Musculoskeletal Pain (CMP) from the perspective of older people >65 years with CMP; to investigate the evidence underlying recommendations to improve physical activity for older people with CMP. **Methods:** Data were obtained from interviews and focus groups with older people with CMP; from systematic reviews of the literature; and from experimental studies. **Results:** Overarching themes were the reduction of physical activity because of pain, efforts to improve physical activity and pain, the importance of physical activity as part of self-management. Evidence supporting interventions to increase physical activity in older people over 65 years with CMP is often based on findings from younger age groups because of the lack of age-specific studies in this field. **Discussion:** Physical activity has a key role to play in the self-management of CMP for older adults. Insight into the perspective of the older adult with CMP aids the understanding of how interventions may be developed and applied. **Keywords:** Musculoskeletal; Pain; Physical Activity; Self-Management.

Exploring everyday activity and function in older adults with chronic pain: New insights with new technology

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Introduction: Chronic pain can affect older individuals in numerous ways, including negatively affecting physical activity and function. **Aims:** There were two aims to this study; to explore the day-to-day patterns of activity, function, and experiences of older adults with chronic pain, and to explore the usability, acceptance, and experience of the measurement tools used in the study. **Methods:** All participants were over 65 years old, and all were living in the community with persistent pain (pain for more than 3 months). Individuals took part in the study for a period of 7 days in which they wore 2 pieces of technology; a LifeShirt and a Sensecam. The LifeShirt is a vest with inbuilt sensors, worn under normal clothing, which allows continuous recording of physical and physiological activity. The Sensecam is a small wide-angle camera worn on the body that automatically takes pictures of the person's environment every 30 seconds, thus acting as a visual diary. The participants also completed a daily diary (based on the Day Reconstruction Method). Participants took part in interviews after the study period in order to gather contextual information regarding pain, activity, and daily function, and to acquire information about their experiences and acceptance of using the methods throughout the study. **Results:** Results to date show a range of patterns of activity and function, and demonstrate a good degree of acceptance of the methods. **Discussion:** The innovative method allows a deeper understanding of activity and daily function of older adults living with chronic pain. As data collection progresses, the emerging themes will be explored in more depth. **Keywords:** Pain; Daily Function; Physical Activity; Measurement of Activity.

EUNAAPA SYMPOSIUM: WORKSHOP ON ACTION, AGING, PHYSICAL ACTIVITY AND PARTICIPATION

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It is without question that regular participation in physical activities confers a variety of health benefits. However, despite this common knowledge about the potential benefits of physical activity, in industrialized countries the proportion of older persons being inactive is still extremely high. In March 2005, the European Network for Action on Aging and Physical Activity (EUNAAPA) was founded as a thematic, collaborative network aiming to improve the health, wellbeing and participation of older people throughout Europe by the promotion of evidence based physical activity interventions from micro up to macro levels. In EUNAAPA the following objectives have been proposed: To identify, disseminate and promote evidence-based practice for the enhancement of physical activity for all older people in Europe; To select or develop evidence-based guidelines for practice in the area of ageing and physical activity; To provide information, and expert advice to policy makers, providers, small and large business companies and professionals in the fields of ageing, physical activity, and health; To influence the development of educational curricula and standards of expertise and competence for professionals involved in the provision and/or enhancement of physical activity for older people; To develop synergies among researchers, providers, small and large business companies and professionals in the fields of ageing, physical activity, health and participation; To support policymakers in intersectional approaches to the promotion of physical activity among all older people; To cooperate with other organisations relevant to the promotion of physical activity among all older people; To involve older people in the development and implementation of network activities.

Development and goals of the EUNAAPA network

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Background: During the world conference on Physical Activity (PA) and Aging in London Ontario (2004), the idea was launched to form a European network to enhance implementation of existing knowledge in the area. Ellen Freiburger (Germany), Lis Puggaard (Denmark) and Marijke Hopman-Rock organised the first network meeting in Leiden in March 2005. Fourteen countries were present and after three days of intensive work together, we drafted a proposal for the DG Sanco section of the European Commission. This mission succeeded and the first European Network for Action on Ageing and Physical Activity (EUNAAPA; www.eunaapa.org) project was born. **Objectives:** In this presentation, an overview will be given of the scientific evidence for the relationship of PA (behaviour) with ageing which are supportive for the vision and goals of EUNAAPA, using several position statements of

leading organisations. **Methods.** A. Overwhelming evidence from RCTs and/or observational studies. B. Strong evidence from a combination of RCT and/or observational studies. C. Generally positive or suggestive evidence from a smaller number of observational studies and/or uncontrolled or nonrandomized trials. D. Panel consensus judgment. **Results:** In most areas, A/B level of evidence is found. The outcome of treatment of some diseases and geriatric syndromes is more effective with higher-intensity exercise. PA levels in persons older than 75 years are still far below what is recommended. **Conclusions:** More PA (counselling and interventions) could be effective if implementation barriers are overcome. This finding has been encompassed in the new roadmap for the future policy of the EUNAAPA. **References:** Chodzko-Zajko et al. American College of Sports Medicine position stand. Exercise and physical activity for older adults. MSSE. 2009; 41, 1510-1530; Biddle S J H, Brehm W, Hopman-Rock M, Verheijden M W. Population physical activity behaviour change: a statement of the European College of Sport Science. EJSS (2011).

Best practices and improved capacities in the field of physical activity and older adults: Results of two projects of the EUNAAPA network

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Objectives: present main results of two EUNAAPA related projects (both coordinated by the University of Erlangen-Nuremberg): best practice inventory to identify key elements of successful physical activity (PA) programs and promotion strategies; building of alliances and monitoring of capacities to promote PA in older adults. **Methods:** 1) to identify examples of PA programs and PA promotion strategies for older people in Europe which were deemed to be 'successful'; to systematically search and describe evidence-based guidelines for the provision and/or promotion of effective PA by older people; to critically compare the PA programs and strategies with the evidence-based best-practice guidelines and to formulate appropriate recommendations; 2) During the PASEO project national intersectoral alliances on PA and older adults were build and an action-plan was developed to promote PA. Process, output and outcome indicators were monitored by through online questionnaires for all national alliance partners, min of alliance meetings and updates of the action plan. **Results:** The best practice inventory identified 100+ successful PA programs and key-elements of these programs such as consisting of multi-components, using progressive exercises and providing regular feedback. Not all of the successful PA programmes are completely in line with current guidelines for general PA programmes for older adults. Results of the monitoring of the intersectoral alliances showed that during the implementation phase, alliances succeeded in carrying out the agreed upon action plans, resulting in increased intersectoral and intra organizational capacities in the field of physical activity promotion for sedentary older people. **Conclusion:** In line with the network's goal, the projects resulted in dissemination of knowledge on evidence-based strategies and improved capacities to improve health and quality of life among older people in Europe through physical activity.

Evaluation and recommendations on specific assessment tools

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Objective: These systematic reviews aimed to critically evaluate the reliability, validity and responsiveness of physical activity, clinical walking speed, Timed Up and Go (TUG) and overall indexes in older people. **Methods:** Literature searches were performed in several different databases. Key words were based on the topic of the measurement properties for each area respectively. The methods and results of all the evaluated measurement properties were rated using a standard checklist for appraising the qualitative attributes and measurement properties of the instruments. **Results:** Eighteen articles on 13 different physical activity measurements, 86 articles on walking speed, 68 articles on TUG, and 78 articles describing 12 different overall indexes were reviewed. For Physical activity the International Physical Activity Questionnaire – Chinese and the Women's Health Initiative-PAQ showed good reliability while the Physical Activity Scale for the Elderly showed variable results for validity. Habitual walking speed seems to be highly reliable in community-dwelling people and residents in mixed settings, while no studies have evaluated maximum walking speed in an aged population. Walking speed is a highly valid test, both at habitual and maximum speed but few studies gave information about responsiveness. The reliability of TUG was high in most studies but there is a lack of studies evaluating absolute reliability. The validity was high in most respects except regarding prediction. Few studies gave any information about responsiveness with respect to TUG, yielding inconclusive results. Regarding overall indexes Short Physical Performance Battery (SPPB) can be recommended most highly in terms of validity, reliability and responsiveness, followed by the Physical Performance Test and Continuous-Scale Physical Functional Performance. **Conclusion:** Physical activity measurements need further evaluation, both habitual and maximum walking speeds are valid instruments and they predict death, hospitalization/institutionalization and decline in mobility. TUG can be recommended to be used in most settings and SPPB is the overall index of choice. **References:** Forsén L, Loland NW, Vuillemin A, Chinapaw MJ, van Poppel MN, Mokkink LB, van Mechelen W, Terwee CB. Self-administered physical activity questionnaires for the elderly: a systematic review of measurement properties. *Sports Med.* 2010; 40:601-23; Rydwick E, Bergland A, Forsén L, Frändin K. Psychometric properties of Timed Up and Go in elderly people: a systematic review. *Phys Occup Ther Geriatr* 2011; 29: 102-125; Rydwick E, Bergland A, Forsén L, Frändin K. Investigation into the reliability and validity of the measurement of elderly people's clinical walking speed: A systematic review. *Physiother Theory Pract* 2011, Sept 19 [Epub ahead of print]; Freiburger E, de Vreede P, Schoene D, Rydwick E, Mueller V, Frändin K, Hopman-Rock M. Performance-based physical function in older community-dwelling persons: A review of instruments. Submitted to *Age Ageing*, October 2011.

The future of EUNAAPA: Action and invitation

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Objectives: To actively enlarge the societal and economic impact of the bundled talents, innovative knowledge and experiences of EUNAAPA via its members into the whole of Europe for the sake of life long active participation of all older European citizens. **Methods and results:** Circulation of the over the past years jointly built innovative knowledge and experiences within the network, via projects, newsletters, summer-schools and multimedia; increase the effort and spread of new knowledge via multilevel (macro-meso-micro level)

interdisciplinary integrated projects (one of which will be a project for the validation and spread of the “Better in, better out” concept; see references), if possible and relevant also in private-public co-operations and together with co-networks (HEPA, PROFANE, EGREPA, EUMusc, etcetera’s); and last but not least active involvement in Brussels’ to influence and set up agendas for policies and interventions for active participation of the older adults in Europe and, rather revolutionary, in EUNAAPA itself! **Conclusion:** In order to continue the overwhelming success of innovation for society over the last two centuries, active participation of all people, especially older adults, is paramount. EUNAAPA’s knowledge, network and dissemination strength to actively involve older adults in society in this respect may play a pivotal role here. Thus, increase and strengthening of its innovative knowledge and experiences will be the main issue in the next years. We welcome all members and all non-members to participate, and share our ambitions. **References:** www.eunaapa.org; Hulzebos *et al.*, JAMA 2006; ; Dronkers *et al.*, Clin Rehab 2010; Hoozeboom *et al.*, Osteoarthritis Cart 2009, Clin Rehab, 2010 and PlosOne 2012.

“GET FIT FOR ACTIVE LIVING”: HELPING OLDER CANADIANS TO GET AND STAY ACTIVE

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The Get Fit for Active Living (GFAL), an 8-week evidence-based program, is an older adult physical activity education/experiential program developed by the Canadian Centre for Activity and Aging. The GFAL research project was a demonstration project which sought to demonstrate how community based structured exercise educational programs can be delivered in Canada. Almost 200 adults 65 years and older from five cities in Canada participated in this project that educates older adults about the importance of exercise and provides them with experience in developing an exercise routine, which in turn motivates them to continue their exercise. The purpose of the project was to determine the long-term functional fitness changes and program adherence at 6- and 12-month follow-ups in previously sedentary older adults. An additional purpose was to assess the impact of “booster” sessions on long-term exercise adherence rates. The symposium will cover a study overview, short-term and one-year functional outcomes, changes in physical activity patterns and physical activity self-efficacy. **Keywords:** Active Living; Fitness; Exercise; Motivation and Behaviour Changes.

NUTRITIONAL INTERVENTIONS ON AGEING MUSCLE AND BONE HEALTH

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Exercise and nutritional strategies for the prevention of osteoporosis

Chilibeck, Philip

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Exercise and proper nutrition are important for preventing bone loss and preventing development of osteoporosis. Several nutritional supplements have been promoted for preventing bone loss including soy isoflavones and conjugated linoleic acid. Optimal exercise for building bone and preventing osteoporosis includes exercise that induces high impact loading (i.e. jumping, bounding) and high muscle tension (i.e. resistance training). The

exercise prescription for someone who has already developed osteoporosis and has fragile bones could be quite different. This presentation will discuss controversies surrounding nutritional supplementation including findings that soy isoflavone supplementation may actually interfere with the positive effects of exercise on bone. The optimal types of exercise for preventing osteoporosis and safe exercise prescriptions for people who have already developed osteoporosis will also be discussed.

Effect of creatine application strategies on aging muscle and bone health

Candow, Darren

University of Regina, Canada.

The age-related loss of muscle (sarcopenia) and bone mass (osteoporosis) has a negative effect on muscle strength, functionality and overall quality of life. Creatine supplementation has been shown to have a positive effect on aging muscle mass and strength when combined with resistance training. The timing of creatine supplementation during resistance training may be an important factor for stimulating muscle hypertrophy in older adults. In addition to the positive effects from creatine supplementation on aging muscle mass, creatine may also have a favorable effect on bone health. This presentation will discuss the effects of creatine supplementation and resistance training on properties of aging muscle and bone biology.

SEDENTARY BEHAVIOUR: OPPORTUNITIES FOR ACTION SYMPOSIUM

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Sedentary behaviour is defined as activities performed while sitting or lying with low energy expenditure. In modern society, the vast majority of time is spent seated whether for work, transport or leisure activities. There is mounting evidence that this time spent sedentary has specific physiological and deleterious effects on health and wellbeing distinct of those due to lack of physical activity. In order to promote health and wellbeing interventions need to consider not only increasing physical activity but also decreasing sedentary behaviour. The majority of sedentary behaviour research has been conducted in children and adult populations, yet older adults are the most sedentary segment of society. This symposium brings aims to redress this balance by presenting the evidence related to sedentary behaviour research in older people and to identify opportunities for action. **Keywords:** Sedentary Behaviour; Intervention; Behaviour Change.

Sedentary behavior and health: A view from the National Institutes of Health–American Association of Retired Persons diet and health study

Matthews, Charles E

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Older adults in Western countries routinely spend 60 to 70 hours or more each week in sedentary behaviors (i.e., sitting), and it appears that a few hours of exercise each week

may not be sufficient to provide complete protection against the adverse health effects associated with so much sitting. However, our understanding of the full range of health/disease outcomes associated with prolonged sitting remains incomplete. In the mid-1990's The National Institutes of Health American Association of Retired Persons (NIH-AARP) Diet and Health Study enrolled more than 500,000 US adults aged 50 to 71 years into the study and it has followed their health since that time. It is among the largest prospective studies investigating the relation between time spent in sedentary behaviors and health in older adults. New results from the NIH-AARP Study will be presented evaluating the role of sedentary behaviors and all-cause, cardiovascular, and cancer mortality. In addition, study results for several incident cancers will be examined. The findings from our study and others continue to provide new insight into the range of disease outcomes that have been linked to large amounts of sedentary behavior in older adults, but many questions remain unresolved. At what level (or amount) of sedentary behavior does the risk for chronic disease increase? How much, what type, and what patterns of physical activity are effective in minimizing risks associated with too much sitting? The opportunities for answering these etiologic questions and addressing future measurement challenges will be discussed.

Association between sedentary behaviour and cardiometabolic risk factors in older adults

Stamatakis, Emmanuel

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Study Objective: To examine the associations between sedentary behaviour (SB) measured objectively and by self-report and cardiometabolic risk factors. **Method:** Cross-sectional analyses of adults >60yrs who participated in the 2008 Health Survey for England. Main exposures were self-reported leisure-time SB consisting of TV/DVD viewing, non-TV leisure-time sitting, and accelerometry-measured SB. Outcomes included body mass index (BMI), waist circumference, cholesterol ratio (total/HDL), Hb1Ac and prevalent diabetes. **Results:** 2765 participants (1256 men) had valid self-reported SB and outcomes/confounding variables data, of whom 649 (292 men) had accelerometer data. Total self-reported leisure-time SB showed multivariable-adjusted (including for moderate-to-vigorous physical activity) associations with BMI (beta for mean difference in BMI per 30 min/day extra SB: 0.088 kg/m², 95% CI .047 to .130); waist circumference (.234, .129 to .339cm); cholesterol ratio (.018, .005 to .032) and diabetes (odds ratio per 30 min/day extra SB: 1.059, 1.030 to 1.089). Similar associations were observed for TV time while non-TV self-reported SB showed associations only with diabetes (1.057, 1.017 to 1.099). Accelerometry SB was associated with waist circumference only (.633, .173 to 1.093). **Conclusion:** In older adults, SB is associated with cardiometabolic risk factors, but the associations are more consistent when is measured by self-report that includes TV viewing.

Predominance of sedentary behaviour in clinical and rehabilitation settings and detrimental outcomes for the patient

Grant, Margaret

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Hospital admission may rapidly increase dependence in older patients and to avoid this it is recommended that rehabilitation should be implemented early in the hospital stay. Strategies to promote physical activity are considered central to preventing dependence and the physical

performance of patients is often a key factor in determining if a person is returned home or transferred to long-term care. Despite this, high levels of sedentary behaviour are commonly observed amongst patient groups in hospitals. This presentation will discuss the findings from a research study in which postural physical activity and sedentary behaviour was measured objectively. Using a single body-worn monitor, the postural behaviour of 30 patients in two rehabilitation units for older adults was recorded continuously over the period of a week. Results showed the group to be sedentary (sitting and lying) for 95% of the day (24 hours). There was little variation in behaviour between weekdays and weekends and, during the day, most upright activity (standing and walking) was recorded around lunchtime. The time between 08.00-20.00 was explored further and during this 12-hour daytime period 92% of the time was spent in sedentary postures. Much of this time (61.5%) was accumulated in prolonged sedentary events lasting an hour or more.

Effects of a behavioural modification program on sedentary behaviour and physical activity in Type 2 diabetes patients

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Objective: To investigate the effects of a pedometer-based behavioural modification program with telephone support on sedentary behaviour and physical activity in type 2 diabetes patients. **Research Design and Methods:** Ninety-two type 2 diabetes patients from the endocrinology department of the Ghent University Hospital (Belgium) (62 SD 9 years, 69% male) were assigned to either an intervention or a control group using random allocation. Participants of the intervention group received one individual face-to-face session, a pedometer and seven telephone follow-ups during 24 weeks. The intervention was lead by a psychologist and based on the principles of cognitive-behavioral therapy, the Diabetes Prevention Program, the First Step Program and Motivational Interviewing. The selection criteria were (1) BMI 25-35; (2) treated for type 2 diabetes; (3) no physical activity limitations. Sedentary behavior and physical activity were measured using pedometer (steps/day), accelerometer (min/day) and the interview-based international physical activity questionnaire (min/day) over the short- (24 weeks) and intermediate- (one-year) term. **Results:** Participants in the intervention group decreased their sedentary behavior by 23 min/day ($p < 0.05$) and increased their steps/day with 2744 and total physical activity with 23 min/day ($p < 0.001$) post-intervention. After one year, the intervention group still had a decrease of 12 min/day in sedentary behavior and an increase of 1872 steps/day, 11 min/day total physical activity ($p < 0.001$). In contrast, the control group increased in sedentary behavior and decreased in physical activity. **Conclusion:** This 24-weeks pedometer-based behavioural modification program with telephone support showed a positive impact on sedentary behaviour and physical activity for at least half a year after the intervention (or one year post-baseline). This program represents a feasible and effective model for delivery through diabetes education centres.

A review of interventions to reduce sedentary behaviour in older adults

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Purpose: Compelling epidemiological evidence suggests sedentary behaviour as a potential target for health behaviour change in older adults. To date, there has been no review of interventions to influence sedentary behaviour in older adults. This review addressed two questions: 1) How many behaviour change interventions have reported sedentary behaviour outcomes? 2) What are the features of these interventions? **Methods:** A structured search of Medline, PsycINFO, EMBASE, CINAHL, and PEDro was conducted for articles published to end of 2011. Included studies reported change in sedentary behaviour following intervention in older adults. Information on study design, intervention features and behavioural outcomes was extracted, and summarized. **Results:** Of the six studies identified, two specifically targeted older adults, with the remainder having a study population with mean age >60 years. Only 1 intervention targeted sedentary behaviour exclusively, two targeted sedentary behaviour in conjunction with physical activity, and three reported sedentary behaviour outcomes following interventions to influence physical activity. Four interventions reported reductions in sedentary behaviour, including all three specifically targeting sedentary behaviour. These interventions all used device-based measures to assess outcomes. **Conclusions:** While the field of research on interventions to influence sedentary behaviour in older adults is in its infancy, results from these early studies indicate that reductions in sedentary behaviour are achievable. To advance the evidence, future intervention trials should use device-based measures, conduct controlled evaluations (with detailed reporting) of intervention strategies, and further examine the inclusion of physical activity messages in sedentary behaviour interventions.

What sedentary behaviour intervention strategy? Can we learn from large scale computer simulation before trying them in real life?

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Introduction: Older adults are the most sedentary segment of society. Epidemiological evidence suggests that too much sedentary time has deleterious effect on health and well-being. The next stage on the research agenda is intervention studies to understand causation, dose response and develop effective interventions to modify sedentary behaviour. **Aims:** The aim of this study was to investigate the use of large-scale computer simulations to assess the effectiveness of different classes of interventions aimed at modifying sedentary behaviour. **Method:** The temporal behaviour of older adults is modelled using cyclical graph theory developed from empirical time series from the NHANES health survey. Different classes of interventions and different levels of adherence are simulated by changing the probability transition between states in the graphs. Monte Carlo techniques are used to sample response. **Results:** From the initial $N = 1800$ real profile, the method can generate $N > 1$ million ecologically valid and realistic responses to simple model of intervention. This, enables to theoretically explore more intervention scenario that physically possible in the real world. **Discussion:** Computer simulations have the potential to eliminate the need to test empirically all possible avenues and can be used as a filter to only concentrate on most promising method and better targeted interventions. Baseline empirical data for more specific population could be enriched with more contextual data to get more precise results.

FOOTBALL CLUBS AS A VEHICLE FOR PROMOTING HEALTH IN OLDER PEOPLE

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Corporate Social Responsibility (CSR) & specifically stakeholder engagement is becoming increasingly integrated into football business strategy. Traditionally, Football in the Community (FitC) schemes (the community arms and often charities of professional football clubs) have been tasked to deliver on participation and school based coaching agendas. However, there has been a significant shift from work of this nature towards more complex and multifaceted issues (i.e., behaviour change and health). The purpose of this symposium is to highlight the work undertaken by FitC schemes in attending to the health and social inclusion agenda for older people and in turn the promotion of active ageing. The symposium will firstly focus on the perceptions of club officials directly involved in the management and delivery the Fit Fans in Training (FFIT) at a Scottish Premier League Football Club in relation to its impact on CSR. The symposium will then continue on a stakeholder engagement theme exploring one English Premier League Club and their work promoting health and social inclusion for older men within in the Fit Fans project funded by Age UK. The research will then open out to a national perspective with the presented work drawing on data from the Extra Time project. A project delivered nationally by the UK largest sports charity the Football Foundation. This research utilises a multi-method research framework, including Social Return on Investment analysis to understand the impact of the project across 20 English Premier League and Football League Clubs in promoting active lifestyles and social inclusion opportunities. The presentations will provide intervention results and detail how they have utilised evidence-based practice and thorough research and evaluation techniques on large and small-scale community based projects to successfully promote and evidence more active and healthy lifestyles. **Keywords:** Behaviour change; Football; Men; Engagement

Engaging older football fans and corporate social responsibility (CSR): An analysis of club perceptions

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Introduction: Community involvement and the activities of Professional Football Clubs have received widespread focus and investigation (Brown, Crabbe & Mellor, 2006) with Corporate Social Responsibility (CSR) becoming increasingly integrated into football business strategy (Breibath & Harris, 2008; Walters & Chadwick 2009). Engaging older male fans in fitness and health promotion through the Fit Fans In Training (FFIT) intervention has been used as an initiative in tackling traditionally poor engagement with health services amongst this population, (Galdas, Cheater and Marshall, 2005; De Visser, Smith and McDonnell 2009). This study examines the perceptions of club officials directly involved in the management and delivery of FFIT at a Scottish Premier League Football Club in relation to its impact on CSR. **Methods:** Semi structured interviews at the end of the annual programme took place between Club officials directly involved with this programme (Head of the Community Charity; Health and Exercise Scientist; Executive Director). Auto ethnographical techniques involving personal narratives and access to personal notes during the intervention were also used to record perceptions of the programme. Inductive processes followed which involved

the formation of transcribed content into meaning units that were subsequently structured into theoretical themes for analysis. **Results:** The results indicate a strong awareness of the club to re-examine their CSR in relation to engaging with their older fans as part of a strategic long-term process. Engagement with this population led to the acknowledgement that older fans perceptions of club responsibility and culture is extremely positive and resulted in greater desire to exhibit greater fitness behaviour. Subjects reported a desire to restructure aspects of their organisation in order to accommodate ageing fans within their community charity model. **Discussion:** In promoting their CSR, Football Clubs could be disengaging from their ageing fan base with evidence suggesting that community programmes predominantly focus on (at risk) younger fans. Research indicates that clubs could be missing excellent opportunities as older fans are extremely positive and privileged to be engaged due to longer association. This study is also significant as very little research currently exists within this environment. This research also suggests that clubs may have to be more proactive and original when promoting their CSR across the age continuum. **References:** Breibath, T. & Harris, P. (2008): The Role of Corporate Social Responsibility in the Football Business: Towards the Development of a Conceptual Model, *European Sport Management, Quarterly*, Vol.8, No.2: pp. 179-206; Brown, A., Crabbe, T., & Mellor, G. (2006): Football and its Communities. Final report for the Football Foundation. Retrieved on 8th February, from www.substance.coop/files/football; De Visser, R.O., Smith, J.A. & McDonnell, E.J. (2009). "That's not masculine": masculine capital and health-related behaviour. *Journal Health Psychology*, Vol.14: pp. 1047-58; Galdas, P., Cheater, M.F. & Marshall, P. (2005). Men and health help-seeking behaviour: literature review. *Journal Advanced Nursing*, Vol. 49: pp. 616-23; Walters, G., & Chadwick, S. (2009): Corporate citizenship in football: delivering strategic benefits through stakeholder engagement, *Management Decision*, Vol.47, No.1: pp. 51-66. **Keywords:** Football; Health Promotion; Fitness Behaviour.

Fit fans: Understanding the effectiveness of an intervention to promote positive behaviour change in older men delivered within an English League football club

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Introduction: Men appear to engage in a range of 'masculine' behaviours that contribute to poor health including poor diet (Gough and Connor, 2006) and lifestyles (De Visser, Smith and McDonnell, 2009). Additionally men tend not to engage in or delay the use of health services (Galdas, Cheater and Marshall, 2005). To tackle this football has been seen a vehicle to engage people in healthy lifestyle through the provision of health services (White, et al., 2011). This study focuses on the evaluation of the Fit Fans (FF) intervention in promoting positive behaviour change in older men. FF is delivered within a English Premier League (EPL) Football Club (FC). **Methods:** 7 men aged 45 > years attended weekly behaviour change and exercise sessions (1 hour in duration) across at 8 month period (Oct 2010 – May 2011). Each participant took part in at least one 6-week cycle. Baseline physiological measurements included (Body Mass Index (BMI), Resting Blood Pressure (RBP) and Abdominal Girth (AG) (these were repeated every 6 weeks). Following the initial session, the practitioner designed a personalised behaviour change programme for individual participant. The 1st Author engage in ethnography and observational research techniques to collect further information within field notes, alongside a reflective diary. **Results:** The results show no significant changes within the physiological measures; however, results evidence positive BMI changes in 3 men and weight management across the cohort. The men did make a range

of more subtle bespoke goals that impacted their day-to-day existence significantly (i.e., ability to walk short distances, reduction in alcohol intake), which made them 'feel better'. Unexpectedly the cohort exhibited a range of serious diagnosed illnesses that challenged the practitioner's skill base and experience in delivery on the health agenda. All participants reported the FC playing a role in making the prospect of engaging in behaviour change and exercise 'more appealing' than mainstream National Health Service support. **Discussion:** Practitioners have to be accustomed of subjective subtle goal setting that is appropriate to each individual and their daily life; and not engaging in the typical nature of just following national guidance. Whilst also be able to effectively deal with the complex needs of older men (i.e., a range of serious illness). The involvement of the FC appeared to contribute favourably to maintenance in the intervention. This research suggests for the provision of a community 'facing' facility within FC's alongside appropriately skilled and experienced practitioners will strengthen health interventions, especially for older men. **References:** Gough, B. & Conner, M.T. Barriers to healthy eating amongst men: a qualitative analysis. *SocSci Med* 2006; 62:387-95; De Visser, R.O., Smith, J.A. & McDonnell, E.J. (2009). "That's not masculine": masculine capital and health-related behaviour. *Journal Health Psychology*, 14: 1047-58; Galdas, P., Cheater, M.F. & Marshall, P. (2005). Men and health help-seeking behaviour: literature review. *Journal Advanced Nursing*, 49: 616-23. **Keywords:** Football, Healthy Lifestyle; Motivation and Behaviour Change.

An economic analysis of extra time: A football oriented community programme using social return on investment (SROI)

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Introduction: Extra Time (ET) is a national programme that aimed to promote positive physical and social opportunities in older people (over 55 years) and tackle social exclusion (Social Exclusion Unit, 2006). ET was delivered by Football in the Community (FitC) schemes across England. The aim of this research is to present the social and economic impacts of the ET programme. **Methods:** Social Return on Investment (SROI) is an adjusted cost-benefit analysis that quantifies the value of social, environmental and economic outcomes that result from a service/programme (NEF, 2004). Individual SROI analyses were carried out on five FitC schemes undergoing in-depth study. Stakeholder (i.e., participants and the state) engagement helped identify the outcomes. The 1st Author employed informal and interactional research techniques (including observations, informal interviews and personal reflections). The identified outcomes were measured via the development of entrance and exit participant surveys. 422 participants, 90% over 60 years old, (41% male and 59% female) completed both the entrance and exit surveys (after approximately 8 month's engagement within the ET, Sept 2009–July 2010). Social and economic analysis was conducted employing SROI methodology, using the aforementioned data to provide evidence-based parameter values for use in the calculations. **Results:** Results indicate that the measurable social benefits outweigh the investment by more than 1:5.22. Most value is created for the participant. Authors are keen to tell the story of the complex measures and data involved and not merely focus on the SROI headline. In this sense, the data collected alludes to the development of positive physical, social and emotional changes in the participants, alongside a self-reported reduction in use of health services. **Discussion:** This work is vital in building upon the sparse literature available on SROI. The process was extensive, time consuming and expensive. Whilst this provided invaluable context and data, concerns are raised of the 'pressure' of a

positive headline, at a cost to 'telling the story' of complex of positive change experienced by participants involved. **References:** New Economics Foundation (2004). *Social Return on Investment: Valuing What Matters: Findings and Recommendations from a Pilot Study*. Editors. D. Boyle and M. Murphy. London: New Economics Foundation; Social Exclusion Unit (2006). *The Social Exclusion of Older People: Evidence from the First Wave of the English Longitudinal Study of Ageing (ELSA) – Final Report*. Retrieved from: <http://www.communities.gov.uk/> on 27th February 2011. **Keywords:** Football; Social Return; Economic.

Oral Presentations

WORKING WITH FRAILER OLDER PEOPLE IN REHABILITATION

Exercise lapse problem-solving among cardiac rehabilitation initiates: Predicting solution persistence

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Adherence to exercise is important for disease self-management in older adult (OA) cardiac rehabilitation (CR) initiates, but problems can lead to exercise lapses. Social cognitive theory (SCT) links self-efficacy (SE) to persistence required for adherence to activity. However, this efficacy-persistence process is seldom examined. Persistence related to lapse-related problems is key to exercise adherence self-regulation (Bandura, 1997). The model of social problem solving (MSPS) suggests that differences in problem-solving effectiveness (PSE) moderate behavior, where higher PSE individuals have better outcomes than lower PSE counterparts. The SE persistence relationship during lapse-related problems has not been examined relative to exercise in CR. Using the SCT and MSPS models, we examined SE and problem-solving (PS) as predictors of persistence toward PA adherence when OA CR initiates were facing a lapse-related problem ($N = 33$, age = 63.4 years). Participants were presented with a pre-tested, relevant problem about an exercise lapse. It was hypothesized that SE for exercise self-regulation would predict persistence with CR exercise self-regulation, and SE for PS would predict persistence with PS. Regression indicated significant relationships, $R^2_{adj} = .52$, $p < .001$ and $R^2_{adj} = .26$, $p = .001$, respectively. Hierarchical multiple regression was used to examine PSE and SE for lapse solution implementation (SESI) in predicting persistence with SI (PSI). PSE was related to PSI, $R^2_{adj} = .13$, $p < .05$. Together, PSE and SESI predicted PSI, $R^2_{adj} = .56$, $p = .001$, R^2 change = .42, $p < .001$. Finally, a moderator effect was detected by a significant interaction between PSE and SESI making additional contribution to total PSI, $R^2_{adj} = .61$, $p < .05$, R^2 change = .05, $p < .05$. This is a first demonstration of persistence-process relationships among OA CR exercise participants facing a lapse-related problem. Implications for research and OA exercise intervention will be discussed. **Keywords:** Cardiac Rehabilitation; Exercise Lapses; Self-Management; Problem-Solving.

Physical activity levels of people attending Phase IV cardiac rehabilitation and those who no longer attend

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Introduction: Cardiac rehabilitation (CR) is a well-established programme that enables patients to recover from an event and improve their functioning. The last phase in this process (Phase IV) is the long-term maintenance and management of cardiovascular health. We have investigated the physical activity levels in those attending Phase IV CR classes and those who no longer attend the classes. **Methods:** A questionnaire was sent to all current members of Phase IV CR and to those who no longer attend. The questionnaire also contained the Godin Leisure-time Exercise Questionnaire (GLTEQ) to assess self-reported 7-day physical activity. **Results:** There was a 60% & 34% response rate from Phase IV members & ex-members respectively. Demographically both groups were very similar in terms of age, weight and height. On average, Phase IV members attended a class once per week and only 26% stated they would like to attend more often. Over 80% of members travelled by car to the Phase IV classes and 51% of ex-members travelled by car to exercise as well. Both groups reported walking to be their most common physical activity. The ex-members commented on why they no longer attended the classes and the main themes identified were around a lack of challenge in the exercise/exercise elsewhere; work/other commitments; illness/other conditions and suitability/access issues. Physical activity levels in Phase IV members did not differ significantly from ex-members for mild exercise or total weekly activity. However, moderate physical activity levels between the groups approached a statistical significance and ex-members engaged in significantly more strenuous exercise than members ($p < 0.019$). **Conclusions:** Phase IV CR can provide at least 60 min a week towards physical activity targets for cardiovascular health. Strenuous physical activity levels may be higher in people no longer attending Phase IV CR, but further research is now being carried out to investigate this objectively. **Keywords:** Cardiac Rehabilitation; Physical Activity; Cardiovascular Health.

Physiotherapy intervention for preventing the deterioration of respiratory muscle function in the frail elderly

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Introduction: The loss of muscle mass and strength related to aging process can be cause of functional impairment and physical disability. In the oldest old, the respiratory function may be seriously compromised when the marked decrease of respiratory muscle (RM) strength coexist with comorbidity and immobility syndrome. Since RM training have been shown to be an effective method to improve RM strength and endurance, both in healthy people and patients, this could be an efficient method of preventing the lost of RM function among frail elderly. The purpose of this study was to determine the effectiveness of RM training using a threshold loading device, or Yoga Pranayama breathing exercises vs. a Control group in impaired elderly population. **Methods:** Eighty-one institutionalized elderly people (90% female, mean age 85) who were unable to walk or perform general exercise conditioning, were assigned randomly into three groups: a Control group and two experimental groups (Threshold and Pranayama). Experimental groups performed a supervised interval-based training protocol, either through respiratory threshold loading or Pranayama breathing exercises, 5 days per week during six weeks. The main outcomes were measured at four time points: baseline, in the middle of training, post-training and follow-up. **Results:** Seventy-one residents completed the study: Control ($n = 24$); Threshold ($n = 23$); Pranayama ($n = 24$). There was a significant treatment effect on the main outcomes: Maximum Inspiratory Pressure ($F_{6,204} = 6.755$, $p < .001$, $U_2 = 0.166$), Maximum Expiratory Pressure ($F_{6,204} = 4.257$, $p < .001$, $U_2 = 0.111$) and Maximum Voluntary Ventilation ($F_{6,204} = 5.322$, $p < .001$, $U_2 = 0.135$). **Conclusion:** Pranayama training group works differently and better than the other

two groups, and may be therefore, a powerful alternative to general exercise conditioning in order to improve RM function in the elderly population, with a significant loss of mobility and exercise capacity. **Keywords:** Respiratory Muscle; Yoga; Exercise Capacity; Mobility.

Tele-pulmonary rehabilitation in Scotland

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Background and Objectives: Programmes of pulmonary rehabilitation (PR) are tailored to individuals to improve symptoms, quality of life and self-management. Many people, who live in rural areas, are socially isolated, or who live with severe disease that reduces mobility, are unable to travel far. Patients in Scotland were invited to participate in "hub and spoke" PR programmes, linking sites using video conferencing technologies. The key objectives for the project were: Improved health, well-being and empowerment; Increased physical fitness; Reduced exacerbations and anxiety; greater independence; Reduced social isolation; Fewer emergency admissions. **Methodology:** Two clinical measures were used: walking tests (Six Min or Incremental Shuttle) and the Chronic Respiratory Questionnaire (CRQ); and a Client Satisfaction Questionnaire, together with specific questions relating to the video conferencing experience. The innovative use of pc based video conferencing systems for clinical use was explored. **Results:** 226 patients: 110 conventional classes; 110 telelinked classes; 6 tele-education; Mean age 67 years; Mean improvement in walking distance 37%; Mean improvement in Chronic Respiratory Questionnaire domain scores; 30% additional capacity at each tele PR class; Cost per patient decreased due to increased throughput. **Conclusion:** The delivery of pulmonary rehabilitation using telelinks is at least as good as a traditional model and is acceptable to patients. More patients able to benefit from PR; services delivered closer to home; contributes to peer support and cost efficient. PC based video conferencing technologies works well and is more flexible and portable. The Teams are now working on domiciliary telepulmonary rehabilitation, allowing access for patients who are at a more severe stage of the disease. These patients have not had consistent, equitable access to rehabilitation. We will be able to report on findings at the conference. **Keywords:** Pulmonary Rehabilitation; Respiratory; Video Conferencing; Technology.

The self-management journey in long term conditions

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Chest Heart & Stroke Scotland, UK.

Introduction: The Scottish Government are encouraging people living with a Long Term Condition to self manage. But what is self-management and what does it mean for the thousands of people living with long-term conditions in Scotland today? Chest Heart & Stroke Scotland will map out the journey of a patient living with a long-term condition, showing how both health professionals and patients should be aware of the services provided by the voluntary sector, which greatly support self-management. **Methods:** Living with a long term condition is a journey, in which the patient is in the driving seat, and we will show how the voluntary sector can support people at all the different stages: Diagnosis and acceptance of the condition by the patient; Understanding the condition; Identifying goals; Living with the condition. At each stage, patients and health professionals need to play their own part to allow progression. We will demonstrate how to navigate through the journey highlighting how patients, health professionals and the third sector can work together. **Results:** Self-Management results in empowered individuals who understand their role, as well as that

of the NHS and voluntary sector, in living with their condition. They understand how to identify appropriate services and how to access them. Understanding and participating in self management results in patients who understand their condition, have the confidence to ask questions, know what 'well' means for them and how to maintain it. Successful self-management results in better communication and understanding between the public and health professionals, takes patients' opinions into account in medical decisions and ultimately reduces hospital admissions. **Conclusion:** Self-management fits into the government's vision for a healthier Scotland and with an ageing population it is vital that we work together to reach the ultimate destination of managing long term conditions. **Keywords:** Self-Management; Health Professionals; Communication; Long-Term Conditions.

What do we know about frailty and physical activity? A critical review

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Introduction: Frailty is a frequent health condition in older people. It increases the risk of several health problems, such as falls, comorbidity, disability, and death. Whilst experts support that there is an association between frailty and physical activity (PA), the exact role PA plays on frailty is unknown. The purpose of this study was to critically review current knowledge about the relationship between frailty and PA. **Methods:** We carried out electronic searches in three databases (PubMed, Cochrane Library and PEDro) by interchanging terms related to frailty, PA, and older adults in AND combinations. We retained reviews, perspective/commentary and original studies. **Results:** From a theoretical point of view, PA is probably an efficacious way for reducing frailty severity because PA positively impacts its possible physiological markers (e.g., interleukin-6); moreover, PA has a positive effect on the main domains used to operationalise frailty (e.g., strength, cognitive function). With regards to original researches, we found some evidence that PA improves health outcomes in frail older adults, such as mobility ability. Limited evidence suggests that frailty is not an obstacle as important as disability for taking up exercise training. However, we observed several methodological limitations related to the frailty field (e.g., is frailty a geriatric syndrome or just an expression of biological aging?) as well as to original studies (e.g., operationalising frailty by using a measure of disability). **Conclusions:** Based on current knowledge on frailty, there is limited evidence supporting a beneficial role of PA for frail older adults, which means that any solid conclusions cannot be drawn. However, this is related to studies' limitations rather than a proven inefficacy or harmfulness of PA. We discuss how to overcome the methodological limitations found in research on frailty and physical activity and suggest new perspectives for future research on this topic. **Keywords:** Frailty; Physical Activity; Limitations; Mobility.

Exploring the views of older adults at risk of cardiovascular events on active ageing: Implications for service development

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¹University of Leeds, UK; ²Hamara Healthy Living Centre, UK.

Hamara is a Healthy Living Centre in Leeds providing community-based health related interventions, including an 'active lifestyle' programme for individuals at high-risk of a cardio-vascular event. A focus group with participants generated several themes regarding experiences and factors affecting motivation to attend (n = 8, 50% female, mean age 67; range 64-74). These included feeling supported by staff, not discriminated against because

of their age, and a range of associated psychological, physical and social benefits. These themes are congruent with those in the published literature (Fox et al., 2007, Bauman, 2004), which also describes relationships between sedentary behaviour and chronic diseases, alongside the impact of increasing physical activity on reducing risks of cardiac-vascular events (Wannamethee and Shaper, 2001, Bauman, 2004, Myers, 2003, WHO, 2010, DiPietro, 2001). However, there are recognised gaps with specific relation older adults at high-risk of cardio-vascular events, those who choose to not participate in similar programmes, and factors affecting longer-term intentions and adherence to physical activity. We are addressing these gaps by building upon themes identified within the focus group, firstly by interviewing older adults who choose not to participate to understand their reasons for non-participation. We are also interviewing older adults who are currently or were historically engaged with the programme, to determine: whether they believe their age-specific needs were addressed; their views as to ways in which non-participants could be encouraged to participate, and; how they feel the programme has impacted upon their: _ motivation to initiate and adhere to a physically active lifestyle, and self-management of conditions placing them at high-risk of cardio-vascular events. When data collection and analysis is complete, we will consider the implications for service development. **Keywords:** Cardiovascular; Active Ageing; Self-Management; Implications.

Case studies from older adults with chronic health conditions participating in the Heartmoves physical activity program

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Heart Foundation, Australia.

Background: The Heart Foundation Heartmoves program has been specifically designed for the older adult and especially those with a stable long-term health condition. Over the past 15 years, exercise professionals have been trained by health and fitness professionals to deliver the low to moderate intensity Heartmoves exercise program to the above-mentioned clientele. **Aim/Objective(s):** To share the stories of older adult participating in Heartmoves classes with different long term health conditions such as obesity, diabetes, heart disease, multiple sclerosis and peripheral neuropathy. The case studies will highlight the concerns of older adults entering physical activity programs and the importance of specific training for exercise professionals to be able to safely train the older adult and those with long-term health conditions. The case studies explore the perceived benefits to the older adult of participating in Heartmoves classes on a regular basis. The case studies will highlight the importance of delivering a balanced class including the following components:- muscular strength & endurance, cardiovascular conditioning, balance, flexibility, coordination, as well as an adequate warm up and cool down as well as the importance of social interaction with the leader and other participants. **Keywords:** Chronic Health; Cardiovascular; Physical Activity; Social Interaction.

IMPACT OF THE BUILT AND NATURAL ENVIRONMENT

Invited lecture: Engaging environments for active ageing

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University of Salford, UK.

The UK government has published a number of strategies for an ageing population including Building a Society for all Ages (CLG 2009) which highlights the importance of enabling older people to remain active and mobile within their local communities. This builds on the

strategy for housing in an ageing society, Lifetime Homes, Lifetime Neighbourhoods (CLG 2008) in which the design of both housing and the neighbourhood are equally important. While this movement has had a wider, positive impact on the experience of older people, a more rigorous evidence base is needed to support design for 'lifetime living'; helping people, through design, to stay active and independent in their local communities over the life course. This is recognised by the World Health Organization's Global Age-Friendly Cities programme (WHO, 2007), amongst others This presentation reports on a major UK government-funded research project to fill this evidence gap, Inclusive Design for Getting Outdoors (I'DGO), a consortium of academics (Universities of Edinburgh, Salford and Warwick) and practitioners who provide design guidance on external environments for older people. Two key aspects of I'DGO will be discussed, namely how to better design streets and neighbourhoods to support older people being more physically active, and advances in methodology and theory to underpin design interventions. **References:** CLG, DoH, DWP (2008) Lifetime Homes, Lifetime Neighbourhoods: A National Strategy for Housing in an Ageing Society. London, Department for Communities and Local Government. CLG (2009) Building a Society for all Ages. London, Department for Communities and Local Government; I'DGO (2012) Inclusive Design for Getting Outdoors, www.idgo.ac.uk, [accessed Jan 2012]; WHO (2007) Global Age-friendly Cities: A Guide. Geneva, World Health Organisation. **Keywords:** Active ageing; Design Interventions; Inclusive Design; Lifetime Neighbourhoods; Street Design.

Neighbourhood disadvantage and recreational cycling in a 'baby boomer' cohort: A cross-sectional multilevel analysis

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Background: Cycling confers many benefits for healthy ageing such as improved muscle strength, aerobic capacity, and balance. However, few studies have examined the recreational cycling behaviours of mid-aged adults, and whether the neighbourhood socioeconomic environment influences this activity. We examine the association between neighbourhood disadvantage and recreational cycling and whether this relationship was influenced by residents' perceptions of crime and safety. **Methods:** We used data from the HABITAT multilevel study of physical activity, which sampled persons aged 40-65 years ($n = 11,037$) living in 200 neighbourhoods in Brisbane, Australia. Neighbourhood disadvantage was measured using a composite socioeconomic index. Respondents were asked to report on the frequency of cycling during the last 12 months (never to regularly). Perceptions of crime and safety were measured using a six-item scale derived by Principal Components Analysis (alpha 0.80). The association between neighbourhood disadvantage and cycling was examined using multilevel logistic regression. **Results:** Most respondents (66.4%) reported never cycling, and 11.7% cycled regularly: this latter group were more likely to be male, young, university educated, and living in a high income household. In a baseline model (age and sex adjustment only) residents of the least disadvantaged neighbourhoods were most likely to cycle. After adjustment for within-neighbourhood variation in education and income, neighbourhood inequalities in cycling were reduced, although residents of advantaged neighbourhoods were still more likely to cycle. Residents of disadvantaged neighbourhoods were more likely to perceive their suburb as being unsafe, and adjustment for this factor attenuated neighbourhood inequalities in cycling to non-significance. **Conclusion:** In Brisbane, neighbourhood inequalities in recreational cycling are due mainly to individual-level compositional differences and not to built environment factors. **Keywords:** Cycling; Neighbourhood; Natural and Built Environment; Socio-Economic.

Improving the walkability of the built environment for older people through community street audits

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Living Streets Scotland, UK.

This presentation will present and review the practical and successful walkable communities project Living Streets Scotland is delivering in 2011/12. The project has worked with three older people's community groups in Aberdeen, Glasgow and Fraserburgh, facilitating community street audits to enable the community to identify and prioritise improvements to their walking environment and constructively engage with their local authorities to have short term (low cost) and longer term priorities implemented. The three groups are two health walk groups and a sheltered housing residents' association. The Living Streets' accredited Community Street Audit approach produces a focused eight-page report, identifying the local residents' key concerns for consideration by the local authority. It also summarises the community group and neighbourhood demographics and socio-economic context, for example level of mobility, fears of crime and the key local services generating walking journeys. The presentation will discuss all aspects of the project from the literature review, the recruitment of groups to impact on the ground and monitoring / evaluation. It will identify common conclusions across the three groups around factors influencing physical activity levels and how to successfully implement an asset based approach. The emerging conclusions from the project highlight the need to maintain vegetation and footway surfaces and provide safe crossing points, reflecting key concerns common amongst older pedestrians around visibility and falls and highlighting shortcomings in current orthodoxy around traffic management and maintenance standards and priorities. The presentation will identify some of the key priorities for adapting the built environment for an ageing, less mobile population to maintain and maximise walking, the most common form of physical activity. **Keywords:** Natural and Built Environment; Walking; Physical Activity; Walking.

The influence of environmental factors on older adults' walking for transportation: A study using walk-along interviews

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Background: Knowledge on the relationship between the physical environment and older adults' walking for transportation is limited. Qualitative research can provide valuable information and inform further research. However, qualitative studies are scarce and fail to include neighborhood outings necessary to study participants' perceptions while interacting with and interpreting the local social and physical environment. The current study sought to uncover the perceived environmental influences on Flemish older adults' walking for transportation. To get detailed and context-sensitive environmental information, it used walk-along interviews. **Methods:** Purposeful convenience sampling was used to recruit 60 older adults (50% females). Walk-along interviews to and from a destination (e.g. a shop) located within a 15 min' walk from the participants' home were conducted. Content analysis was performed using NVivo 9 software. An inductive approach was used to derive categories and subcategories. **Results:** Data were categorized in the following categories and subcategories: access to facilities (shops & services, public transit, connectivity), walking facilities (sidewalk quality, crossings, legibility, benches), traffic safety (busy traffic, behavior

of other road users), familiarity, safety from crime (physical factors, other persons), social contacts, aesthetics (buildings, natural elements, noise & smell, openness, decay) and weather. **Conclusions:** The findings indicate that to promote walking for transportation a neighborhood should provide good access to shops and services, well-maintained walking facilities, aesthetically appealing places, streets with little traffic and places for social interaction. In addition, the neighborhood environment should evoke feelings of familiarity and safety from crime. Quantitative studies should investigate if (changes in) these environmental factors relate to (changes in) older adults' walking for transportation. **Keywords:** Walking; Transportation; Natural and Built Environment.

Transforming spaces, transforming lives: Engaging older adults in designing environments that enhance health and mobility

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Introduction: The burgeoning older adult population is at risk for developing a myriad of health problems and is increasingly susceptible to the consequences of reduced mobility. The shifting demographic will challenge our cities to adapt the built environment to accommodate the compromised mobility/disability that can accompany ageing. Our research centers on a unique opportunity to capitalize on a "natural experiment." Our key partner, the City of Vancouver (COV), is making a substantial investment in the built environment to create a Greenway through downtown Vancouver, Canada that prioritizes the of mobility pedestrians.

Purpose: As a first stage in this program of research, we participated in and evaluated the process of developing community-informed design plans that aim to increase the mobility and livability of the built environment, with a focus on older adults. **Methods:** In a series of focus groups, individual conversations, and guided walking tours we spoke with over 50 older adults who live along (or use) the proposed route. **Results and Discussion:** Based on a content analysis of our notes, we determined 4 key themes that reflect perceptions of older adults' regarding key design features necessary to enhance mobility along the Greenway. 1. The current route is not a choice destination but could be. 2. Benches are essential. 3. Sidewalks must be smooth 4. Different opinions about whether automobiles should be allowed along the route. We discuss the themes presented by older adults and the challenges the COV must confront as they develop and modify their design plans to meet the needs of this age demographic. **Conclusion:** In order to best adapt the built environment to be age-friendly it is essential to involve older adults in the design process, however, expectations must be managed. Long-term health and mobility focused planning may not be immediately desirable for older residents living along a route targeted for modification. **Keywords:** Mobility; Natural and Built Environment; Health.

Relationships between the physical environment and older adults' walking and cycling behaviours: The Belgian aging studies

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Background: Socio-ecological models emphasize the relationship between the physical environment and physical activity. The present study aims to investigate the relationship

between urbanization and other environmental factors and older adults' walking and cycling for transportation and recreation and possible moderating effects. **Methods:** Data from 48,879 Flemish older adults were analyzed. Walking, cycling and environmental perceptions were assessed using self-administered questionnaires. The Study Service of the Flemish Government provided objective data on municipal characteristics. Multilevel logistic regression analyses were applied. **Results:** Urban participants were more likely to walk for transportation daily compared to rural (OR = 1.43; 95% CI = 1.22, 1.67) and semi-urban participants (OR = 1.32; 95% CI = 1.13, 1.54). Urban participants were less likely to cycle for transportation daily compared to semi-urban participants (OR = 0.72; 95% CI = 0.56, 0.92). Perceived short distances to services (ORs ranging from 1.04 to 1.19) and satisfaction with public transport (ORs ranging from 1.07 to 1.13) were significantly positively related to all walking/cycling behaviors. Feelings of unsafeness were negatively related to walking for transportation (OR = 0.93, 95% CI = 0.91, 0.95) and recreational walking/cycling (OR = 0.95, 95% CI = 0.92, 0.97). In females, it was also negatively related to cycling for transportation (OR = 0.94, 95% CI = 0.90, 0.98). **Conclusions:** Urban residents were more likely to walk for transportation compared to semi-urban and rural residents. Cycling for transportation was less prevalent among urban compared to semi-urban residents. Access to destinations appeared to be important for promoting both walking and cycling for transportation and recreation. Additionally, feelings of unsafeness were associated with lower rates of walking for transportation and walking/cycling for recreation in all subgroups and cycling for transportation in females. **Keywords:** Walking; Cycling; Environment; Urban.

EXERCISE AND PHYSICAL ACTIVITY FOR CARDIOVASCULAR AND RESPIRATORY HEALTH

Long-term physical activity patterns and lung function decline during adulthood: The Doetinchem cohort study

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Background: Regular physical activity may improve lung health among adults. Since life styles are subject to change, the role of physical activity on lung function decline is ideally determined based on patterns of long-term physical activity levels. The objective of this study was to investigate the association between 10-year physical activity patterns and lung function decline. **Methods:** Men and women aged 26-70 years in the prospective Doetinchem Cohort Study were examined every five years. Data of three examination rounds (between 1995 and 2009) were used for current analyses. Being physically active was defined as spending 3.5 hours or more per week on physical activities of at least moderate intensity. Participants (N = 3452) were categorized as being persistently active, persistently inactive, becoming active, becoming inactive, and having a variable activity pattern. Associations between 10-year physical activity patterns and decline in forced expiratory volume in one second (FEV1) over 10 years were determined by linear regression analyses, adjusted for age, length squared, sex, education, smoking and change in BMI over 10 years, and baseline FEV1. **Results:** Preliminary analyses showed that FEV1 in adults who became physically active declined 29 (95% CI 1 - 57) ml less over 10 years than FEV1 of adults who became inactive. Sensitivity analyses restricting analysis to those participants with constant smoking

behaviour (persistent smokers and persistent non-smokers (N = 3002)) showed that 10-year FEV1 decline was less in adults who became active compared to those who became inactive (mean difference 34 (95% CI 7 - 61) ml, 43 (95% CI 13 - 72) ml, respectively). Being persistently physically active was not associated with a smaller decline in FEV1 over 10 years. **Conclusion:** Preliminary findings suggest that changes in long-term physical activity patterns affect lung function decline. **Keywords:** Long-Term Physical Activity; Lung Function; Smoking; Decline.

Effect of concurrent training on resting metabolic rate in postmenopausal women

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Introduction: Aging and menopause are associated with significant decrease in the resting metabolic rate (RMR), which can be explained by a reduction in the fat-free mass (FFM), and exercise is indicated to minimize these losses. **Objective:** To investigate the effect of concurrent training and fat-free mass on resting metabolic rate in postmenopausal women. **Methods:** A sample of 64 sedentary and postmenopausal women (61.6±7.0 years), distributed according to age (until 60 years and older) and type of intervention (only training, training plus diet, and control). Training group, composed of 34 subjects; training + diet group, composed by 17 subjects; and control group, composed of 13 subjects. The FFM was assessed by DEXA and RMR by indirect calorimetry. The RMR was measured for 30 min during rest. The caloric intake followed the recommendations of the AHA (2000). The intervention period lasted eight weeks, and consisted of 50-min strength training followed by 30-min aerobic exercise. The strength training followed ACSM (2002). The comparison between groups before and after intervention, were performed using the One-way analysis of covariance (ANCOVA), using the software SPSS, version 17.0. **Results:** After eight weeks of concurrent training, women aged older than 60 years, presented higher significant values in the RMR, adjusted by FFM, in the training (16.7±0.49) and training + diet (16.4±0.62) compared with control (14.5±0.54) group. **Conclusion:** Eight weeks of concurrent training alone or associated to a diet program were effective to increase resting metabolic rate in post menopausal women older than 60 years. **Keywords:** Postmenopausal Women; Metabolic Rate; Diet; Calorimetry.

What does a moderate perceived exertion level during aerobic endurance training physiologically mirror in healthy seniors?

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Promoting an appropriate amount of aerobic exercise training is regarded as a major public health concern. Comparative approaches to disentangle associations between subjectively perceived exertion levels and ventilatory, heart rate as well as metabolic responses are lacking in seniors. Therefore, the present study investigated submaximal physiological responses during a perceived exertion-paced 2-km exercise test in seniors, related to their maximal exercise capacity. 20 healthy and active seniors (10 males, 10 females, age: 65±3 years; weight: 69.7±10.9 kg; height: 1.70±0.10 m, physical activity: 11±6 hours per week) were examined by (a) walking-based treadmill ramp testing in order to assess maximal exercise capacity and (b) submaximal 2-km walking testing to compare submaximal Borg-paced exercise with individual maximal exercise capacity. The corresponding exercise

intensity of a moderate perceived exertion level (Borg-value of "four" at the CR-10 Borg scale) during VO₂max-testing was applied for the submaximal 2-km treadmill walking test. Moderate perceived exertion of "four" at the CR-10 Borg-scale lead to 76±8% of VO₂max and 78±10% of VO₂ reserve, 79±6% of HRmax, 64±5% of HR-reserve, and 133±18% of the first (VT1) and 92±9% of the second ventilatory threshold (VT2). The achieved exercise energy expenditure during the 2-km test (time: 27.5 ± 3.6 min) was 3.3±0.5 kcal/kg Bodyweight. No gender-differences of ventilatory, metabolic, heart rate and energy expenditure variables during maximal and submaximal exercise were found ($p = 0.45$). A moderate perceived exertion of "4" at the Borg-CR-10 scale would lead to an (a) adequate ventilatory, metabolic and cardiac response according to established health-related aerobic exercise recommendations and (b) additional absolute energy expenditure of approximately 1200 kcal for 30 min of exercising 5 times per week in seniors. **Keywords:** Aerobic; Health Promotion; Exercise Capacity.

The effects of a long-term physical activity and weight loss intervention on inflammatory biomarkers in older adults

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Purpose. To determine the independent effect of long-term physical activity (PA) and the combined effects of long-term PA and weight loss (WL) on circulating levels of inflammatory biomarkers in older adults, and to assess whether inflammation is a correlate of mobility. **Methods.** 288 older (60-79 years), community-dwelling men and women at risk for cardiovascular disease (CVD) were enrolled in an 18-month randomized, controlled trial. Participants were randomized to either a PA ($n = 97$), PA+WL ($n = 98$), or successful aging (SA) health education ($n = 93$) intervention. Biomarkers of inflammation (adiponectin, leptin, IL-6, IL-6sR, IL-8, and sTNFR1) and 400-meter walk time (s) were measured at baseline, 6 and 18 months. **Results.** Fasting blood samples at baseline and at least one follow-up visit were successfully collected from 270 participants. After adjustment for gender, wave, visit, and baseline outcome measure, only leptin and IL-6 showed a significant treatment effect. Follow-up log-adjusted leptin (pg/ml) was significantly lower in the PA+WL group compared to either PA or SA (9.99 ± 0.04 vs 10.31 ± 0.04 and 10.34 ± 0.04 , respectively; both $p < 0.0001$) and follow-up log-adjusted IL-6 (pg/mL) was also significantly lower in the PA+WL group compared to either PA or SA (0.75 ± 0.04 vs 0.92 ± 0.04 and 0.87 ± 0.04 , respectively; both $p < 0.05$). Spearman correlations between baseline 400-meter walk time and baseline inflammatory biomarkers revealed significant positive correlations for all biomarkers, except IL-8 (r range = 0.14 - 0.35 ; all $p < 0.05$). Only change in log IL-6 was significantly and directly related to adjusted follow-up 400-m walk time [8.05 (SE = 3.49), $p = 0.02$]. **Conclusions.** Addition of dietary-induced WL to PA reduced circulating leptin and IL-6 compared to PA alone and to health education in older adults at risk for CVD. Elevated inflammatory biomarkers were directly correlated to mobility at baseline, but only change in IL-6 directly predicted follow-up 400-m walk time. **Keywords:** Physical Activity; Diet; Weight-Loss; Cardiovascular Disease.

Physical activity patterns in older men and risk of fatal and non-fatal CHD: The mediating role of inflammatory and hemostatic markers

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Aims: To study prospective associations between physical activity (PA) in later life, changes in PA levels and risks of CHD incidence and mortality, and the mediating role of established and novel CHD markers. **Methods:** 4252 men from a UK population-based cohort self-reported usual PA (regular walking and cycling, recreational activity and sport) in 1996 and in 1998-2000, alongside other health behaviours and medical history. 130 fatal CHD and 207 first fatal or non-fatal events occurred during 9 years follow-up. **Results:** Among 3012 men free from CVD and diabetes in 1998-2000, 9% reported no usual leisure time PA and 33% "moderately vigorous or vigorous" PA. Compared to men reporting no activity, Hazard Ratios (HRs) (95% CIs) for first CHD event for "occasional", "light", "moderate" and "moderately vigorous or vigorous" PA, adjusted for age and region were 0.82(0.50,1.35), 0.57(0.33,0.98), 0.67(0.39,1.17), 0.60(0.36,0.98), $p(\text{linear trend}) = 0.04$, adjustment for established risk factors (alcohol and tobacco use, social class, lipids, BP and BMI) attenuated HRs, abolishing the linear trend. Equivalent HRs for fatal CHD were 0.93(0.51, 1.68), 0.52 (0.27,1.02), 0.65(0.32,1.28) and 0.48(0.26,0.89), $p(\text{linear trend}) = 0.004$. HRs were partly attenuated by adjustment for established risk factors and completely attenuated by adjustment for CRP, D-dimer or vWF. CHD case fatality was markedly higher (72%) among inactive/occasionally active men than among men light or more active (52%) [age and region adjusted OR 2.45 (95%CI 1.25, 4.80)]. Men who maintained at least light PA or increased PA level appeared to have lower CHD risk than men who remained inactive or reduced PA level. **Conclusions:** Later life PA is important for primary prevention of CHD in healthy older men. Even modest PA levels nearly halved the risk of CHD morbidity and mortality, and halved case fatality. Associations were mediated by established CHD markers and, for mortality, by inflammatory and hemostatic markers. **Keywords:** Physical Activity; Later Life; CHD; Morbidity; Mobility.

Small arterial stiffness and aging in highly active people

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Introduction: Age-related stiffening of arteries is a strong marker for future cardiovascular complications with small arterial stiffness a better indicator of cardiovascular health than large artery stiffness. Information on the relationship between small arterial stiffness and physical activity is limited, however, as the large artery compliance has been the primary focus in most cardiovascular health studies. **Purpose:** The aim of this study is to assess the relationship between physical activity and small arterial stiffening in a younger and older adult population. **Methods:** Thirty-eight (Y) college students, (24 men, 14 women; 19.4 ± 1.2 y), and 49 older (O) adults (21 men, 28 women; 57.6 ± 10.5 y), were categorized as highly active (HA) (17 Y, 33 O) or normally active (NA) (21 Y, 16 O) based on self-reported vigorous physical activity questionnaires. Resting cardiovascular measurements included large (C1) and small (C2) arterial compliance, blood pressure, and heart rate. Statistical analysis included a general linear multivariate model with $p < 0.05$. **Results:** No differences were found between men and women and thus C1 and C2 values were subsequently pooled for sex. C1 and C2 were greater in the Y than the O (18.35 ± 3.8 , 9.09 ± 2.4 vs. 15.8 ± 4.6 , 5.8 ± 3.4 mL/mmHg $\times 10$, respectively). The HA (including Y and O) had greater C2 than the NA (7.57 ± 3.7 vs. 6.77 ± 3.04 mL/mmHg $\times 10$) but there were no differences in C1. **Conclusion:** The literature has shown highly active adults to have greater large arterial compliance than their normally active peers and conversely no difference in large arterial

compliance between young active and normally active people. We demonstrated that both the young and old highly active groups have greater small arterial compliance than their normally active age-matched peers that may indicate that high levels of habitual exercise reduce the risk for future cardiovascular complications. **Keywords:** Physical Activity; Arterial Stiffness; Aging; Cardiovascular.

The lunar trek: Heart and chest patients make it to the moon

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Introduction: The Inverclyde Globetrotters affiliated to national charity Chest Heart & Stroke Scotland (CHSS) in 2010. CHSS has over 60 heart and chest community peer-support groups across Scotland. These affiliated groups, which are member/volunteer led, provide a wide range of activities and offer members, relatives and carers ongoing support, stimulation and companionship in a friendly and relaxed environment. **Methods:** The Inverclyde Globetrotters had formed in 2008 from a weekly Phase IV cardiac rehab class. Members were asked "Do you fancy walking round the world" to encourage them to stay active between classes and give them a long-term goal and provide a sense of achievement. The approach is simple and fun. All you need is a pedometer. Each week steps walked and the distances walked, cycled and rowed during the class are recorded. Members now look at the distance screen on the gym machines rather than the clock. They became a team. In May 2010, after 117 weeks on the road, the Inverclyde Globetrotters arrived back in Greenock having clocked up 30,688 miles. Class attendance has doubled to an average of 23. The distance walked has doubled to an average of 440 miles per week. The average age of members is 69 years. Inspired by the success of the Globetrotters, groups across Scotland from Orkney to Dumfries embarked on their own virtual tours, to collectively help the Globetrotters reach their next destination – the Moon. **Results:** Over twenty weeks they walked, ran, cycled and danced over 240,000 miles. Their feat has been supported by local communities and had the backing of one of Britain's best-known figures, astronomer Sir Patrick Moore, the UK Prime Minister, the First Ministers of Scotland, Northern Ireland and Wales and members of the Scottish Parliament. **Conclusion:** The aspiration of the Globetrotters, that exercise can be fun, develops camaraderie and most of all can help people to stay well and out of hospital, has been realised. **Keywords:** Globetrotters; Pedometer; Heart and Chest Patients.

USE OF VOLUNTEERS TO PROMOTE ACTIVITY

Invited lecture: Retiring into action

Cullen, Brid

University of Edinburgh, UK.

The growing ageing population is a unique opportunity to engage older people in strengthening communities and building their capacity. How do we impart this message to policy and decision-makers at local and national levels? My Research Fellowship at the University of Edinburgh, on the theme of Active Citizenship in Later Life, includes organising a two-day conference in late June, entitled Retiring into Action. This will bring together policy-makers, researchers and practitioners from around the UK and Europe, to share evidence of positive approaches that promote older people's participation in society.

Delegates will share the experience of their country in trying to engage older people as active citizens and volunteers. The countries represented include Denmark, Ireland, Czech Republic, and Germany, and this pan-European dimension will be an important feature of our discussions. The programme will identify ways to work collaboratively to influence the policy agenda, identify gaps and areas where capacity needs to be addressed, and develop an action plan to address these issues. The findings and conclusions will be presented for discussion and debate at this seminar.

“If they can do it . . . then so can I!” Using volunteer peer educators to assist in exercise program campaigns

Castell, Patricia S

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Older adults often do not or may not perceive the immense health benefits gained by undertaking appropriate exercise programs to suit their conditions and abilities. Ways to encourage older adults to overcome the identified barriers to become and remain physically active is very challenging. Peer mentoring and modelling has been found to be of value in this area. By having older adults demonstrate appropriate exercises and provide information to their peers, it has been shown to be an effective means to facilitate exercise engagement for many older people who are less active, have health issues and physical functional problems. An older adult display team have been involved for many years in demonstrating exercise options available which have triggered many people become and remain physically active for as long as possible. “The Motivators” are a team of volunteers who demonstrate safe and appropriate exercises to community groups. The team age ranges from mid fifties to mid nineties. Their aim is to raise awareness, demonstrate, inspire, encourage and motivate older adults to exercise. These displays and activities have been undertaken in many settings, primarily in community and supported care. The demonstrations alleviate many older adult concerns which range from general fitness and health issues to specific conditions. Sessions often support a health education component relating to a specific topic. Team members have also been involved in the development of older adult resources such as “Staying Active – Staying Safe” falls prevention exercise booklet, video and DVD. The group is facilitated and accompanied by a specialist in exercise for older adults. **Keywords:** Volunteering; Peer Mentor; Health Promotion; Physical Activity; Exercise Programme.

Mobility limitation, access to outdoors and quality of life: A randomised controlled trial delivered by older volunteers

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The emphasis on home care instead of institutional care has increased the number of home-confined and isolated frail people in the communities. Volunteers could provide recreation for such people. We examined the effects of an individualized out-of-home recreational activity intervention on different dimensions of quality of life (QoL) among community living older people, who have difficulty accessing the outdoors independently. Volunteering, Access to Outdoor Activities and Wellbeing in Older people (VOW) project (ISRCTN56847832) was a randomized single blinded controlled trial (RCT) conducted in Jyväskylä, Finland,

in 2008-2011. The inclusion criteria were: agree to participate in a RCT, age 65 or higher, severe mobility limitation, willing to increase outdoor activity and able to communicate normally. 125 people aged 67-92 years meeting the criteria were interviewed at home and subsequently randomized into intervention or waiting list control group. Each intervention group member was assigned a trained volunteer who assisted the participant in attending recreational out-of-home activities once a week for three months. The primary outcome was QoL measured with WHOQOL-BREF which includes the overall QoL (2 items), physical capacity (7 items), psychological well-being (6 items), social relationships (3 items) and environment (8 items). The baseline characteristics of the intervention and control groups were comparable. For physical capacity subscale a significant treatment effect was observed ($p = 0.005$) while for other QoL dimensions no effects were observed. For the total score a borderline significant group difference was observed after the intervention ($p = 0.076$). This study suggests that decline of QoL among old severely mobility-limited people may be prevented with individualized out-of-home activity intervention. **Keywords:** Volunteering; Mobility; Quality of Life; Wellbeing.

An overview of the development of physical activity programs for the elderly in Israel, 1996-2011

Ben-Moshe, Yosefa

ESHEL, Israel

Introduction: In 2011, 42% of the elderly in Israel exercised on a regular basis, an increase of 6% during 17 years of organized programs aimed specifically for that population. The elderly in Israel are 10% of the population and the 65-75 year old are the biggest age group who exercise on a regular basis. The elderly in Israel are very diverse from ethnic, religious, education, income and cultural characteristics, and more than 25% are defined officially as "poor." **Aim:** To provide a range of diverse services. **Methods:** A framework based on the Lawrence Green approach helped to develop a wide range of programs and services aimed at providing physical activities for different kinds of populations. The main principles guiding the development and assimilation of these services are: 1. Variety in content, with cooperation of local and national services for target groups. 2. Low cost of operation and physical accessibility. 3. Collaboration with a University Center. 4. Encouragement of programs based on elderly trained volunteers as main manpower. 5. The responsibility and operation of the programs is on the local authority and local associations for the elderly. **Results:** In 1996, most of the programs and activities were aimed at the disability free populations and today more efforts are dedicated to development of special programs for demented and homebound elderly. Recently we started an experimental visibility physical activity program for patients after rehabilitation from CVA, with intent to include physical activity programs for the "basket of medical services" paid by the government. Correspondingly, a wide range of challenging programs was offered to disability free elderly, like Nordic Walking workshops and Walk on The Israeli Trail. **Conclusions:** The programs will be presented in a systematic overview based on the Lawrence Green approach and historical development. **Keywords:** Ethnic Diversity; Physical Activity Programme.

One to one volunteer conversation support: An innovative partnership

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The volunteer stroke service (VSS) provided by Chest Heart & Stroke Scotland (CHSS) was established 30 years ago to support individuals who have communication support needs following stroke. Each local service is coordinated by a staff member who manages a team of trained volunteers. Recent developments reflect the current approach to rehabilitation, helping individuals to identify personal goals and work towards independence. CHSS, in partnership with Glasgow Speech and Language Therapy Service (SLT) identified a local need for 1-2-1 conversation support. A range of services was developed including: hospital in reach which provides volunteers to support conversation in hospital, home outreach which focuses on social communication and community outreach which offers short term support, e.g. when first accessing public transport, or shopping. The services build on the work undertaken by the SLT by supporting individuals to participate in social communication thus raising self-esteem and building self-confidence to reintegrate into local community activities. The outreach coordinator is responsible for recruitment, retention and training of volunteers. Communication support training, including roles responsibilities and boundaries is provided by CHSS in house communication training team. CHSS community services provide a bridge between formal speech and language therapy and access to mainstream social activities. Leaving the service to progress to a more social group setting or an independent role in the community is viewed as a success. The provision of outreach communication support in partnership between Glasgow SLT and CHSS community services has been a positive innovation giving individuals a range of service options to support their journey from formal speech and language therapy to social activities within their community. Of those accessing the service, 87% successfully moved on to the next stage of their rehabilitation journey. **Keywords:** Volunteering; Stroke; Rehabilitation; Communication.

Meet-the-Expert Sessions

REACHING, STIMULATING AND SUPPORTING OLDER NOVICE SOCIAL ENTREPRENEURS TO DESIGN, DEVELOP & DELIVER INNOVATIVE NEW COMMUNITY VENTURES

Easson, Gillian

NESTA, UK

We recognise that it is important for the current generation to stay active in society, remain healthy and autonomous as long as possible. Through group workshops, support, peer mentoring and micro finance grants, Age Unlimited Scotland supported the young old - people in their 50s and 60s to play a central role in the development of social ventures. Workshops gave participants the chance to share and articulate their ideas to build confidence, test thinking and gain peer feedback, and then engage their communities in design and delivery of the creative solutions. The programme developed both the individual and their idea simultaneously; raising confidence and increasing aspiration levels to drive the person and their idea forward. We have learned a lot about what types of support are needed to reach, stimulate and support older people: 1) Reach - our programme reached everyday Mr. & Mrs. Ordinary in their 50s and 60s, who have never embarked on solving community/social challenges. 2) Stimulate - we created a motivational driver through the set social challenge: Yr 1 - reducing social isolation in the very old; Yr 2 - improving their community. Both had multiple beneficiaries: local organisations, family, friends and the community could impact from idea. 3) Support - five workshops, peer networking, mentoring, coaching,

micro finance and follow on business support has stimulated the enterprising behaviours and entrepreneurial skills of the individuals: the objectives were for the venture to have sustained community benefit and encourage active ageing of the participating individuals. Little has been done to innovate what people will do when they retire; we are keen to share the learning and approaches from this practical programme for the first time. **Keywords:** Social Environment; Innovation; Active Ageing; Retirement.

MOTIVATE ME: ENCOURAGING UPTAKE AND ADHERENCE TO EXERCISE

Tenn, Trish; Laventure, Bob

Later Life Training Ltd, UK

The Motivate Me (MMe) course, run by Later Life Training Ltd, is designed to provide both theoretical perspectives and practical applications on motivating older people to start and maintain regular physical activity. Motivate Me is an evidence based one day programme that examines in particular the underpinning knowledge of behaviour change. There are a number of models that are used to describe how humans behave and change their behaviour. They help in that they simplify ideas and give us a framework for thinking about ways in which we can operate. In particular, this session will help answer any questions you have about the conversation you want to have with an older person on their barriers, motivators and beliefs.

Practical Workshops

SYMPOSIA AND PRACTICAL WORKSHOP: WORKING WITH HEART FAILURE PATIENTS

How to teach a home exercise programme for patients in heart failure

Cowie, Aynsley¹; Thow, Morag²; Armstrong, Gillian³; Graham, Keri³

¹NHS Ayrshire & Arran, UK; ²Glasgow Caledonian University, UK; ³NHS Greater Glasgow & Clyde, UK.

This symposium will be interactive and will address safe and effective exercise training to improve in function and physical activity in patients with heart failure.

A comparison of home and hospital-based exercise training in heart failure: Immediate and long-term effects upon physical activity level

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Background: In heart failure, reduced physical activity level leads to deteriorations in physical and psychosocial functioning. No previous heart failure research has compared effects of home and hospital-based exercise training upon physical activity level, or has objectively assessed their long-term effects upon physical activity. **Methods:** Sixty patients with heart failure (mean age 66 years; NYHA class II / III; 51 male / 9 female) were randomised to home training, hospital training or control. Both programmes consisted of aerobic circuit training, undertaken twice a week for one hour, for eight weeks. All participants wore an activPAL activity monitor at baseline, and after eight weeks, for one week. The activPAL

identifies time spent sitting/lying, standing, and walking, and measures steps taken and walking cadence. Six months after cessation of training, a subgroup of participants from the home and hospital training groups ($n = 10$ from each group) wore the activPAL for a further week. **Results:** Hospital-based training significantly increased steps taken per day during 'extra long' walks of >500 steps ($p = 0.04$) and 'long' walks of 100-499 steps ($p = 0.01$). Neither programme had any immediate effect upon physical activity level otherwise. Though daily upright duration for the home group significantly improved six months after cessation of training ($p = 0.02$), generally physical activity level was maintained in the long term for both training groups. **Conclusions:** Hospital-based training enabled participants to walk for longer periods. It is clinically important that both training groups maintained physical activity level in the long term, given the potential for heart failure to worsen over this time period. **Keywords:** Heart Failure; Home-Training; Hospital-Training; activPAL; Walking.

Development and formative evaluation of a computer-tailored physical activity education program for hospitalized heart failure patients

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Purpose: Physical activity (PA) is important and beneficial for heart failure (HF) patients. The current work will describe the development of an intervention aimed at promoting PA among hospitalized HF patients including preliminary steps in the formative evaluation of the intervention. **Methods:** We applied the Intervention Mapping (IM) protocol. This entailed performing a needs assessment, defining change objectives, selecting determinants and strategies and developing the materials. We performed a systematic literature review, relied on Social Cognitive Theory and interviewed patients and professionals to select behavioral determinants and strategies. **Results:** The change objective defined was 'patients consistently conduct mild PA on most days of the week for approximately half an hour'. Hospitalized patients cannot start performing PA, so the intermediate aim was intentions to perform PA after discharge since the Theory of Planned Behavior indicates that intention is the closest behavioral determinant. The selected determinants were practical knowledge on PA performance, self-efficacy for, and perceived benefits of, PA. The intervention included: 1) a video with actors (as role models) demonstrating the behavior, 2) a practical knowledge module, including assessments and tailored feedback, and 3) a self-efficacy module, including assessments of self-identified barriers to PA and tailored feedback to overcome the barriers. We pre-tested the assessments and feedback on patients and made adjustments accordingly. **Conclusions:** The systematic development of the computer-tailored PA program for hospitalized HF patients using the IM protocol resulted in a theory- and evidence-based intervention. The appreciation, usability and efficacy are yet to be determined in a trial. **Keywords:** Physical Activity; Heart Failure; Intervention; Technology.

Exercise outcomes in chronic heart failure clients

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Introduction: Chronic heart failure (CHF) is a condition that is associated with substantial morbidity and mortality. The aim of this program was to improve patient outcomes and reduce acute hospital admissions through sustaining regular participation in exercise.

Methods: Subjects were 139 patients, New York Heart Association Classification (NYHA) 1-3, who completed the CHF exercise program up to December 2010. The exercise program consisted of referral by the CHF Nurse Practitioner, initial assessment undertaken by the CHF Exercise Physiologist (EP) who undertook the exercise prescription and delivery of cardiovascular endurance and resistance exercises 1-2 times per week for 60 min. Mean number of sessions attended was 12.51. A review assessment was undertaken by the EP 3-6 months post discharge to evaluate adherence to exercise and functional levels. All data regarding hospitalisations was obtained from the online patient data system, a clinical service suite which provides users with access to patient information. **Results:** Of the 139 patients who completed the CHF exercise program, 56.8% (n = 79) of these had returned to hospital post discharge for cardio-respiratory (CR) reasons. Mean number of days from discharge to first CR hospitalisation for the cohort was 225.70 (SD = 191.21). The mean number of CR hospitalisations for those who continued exercising (121 patients) was 0.91, compared to 3.55 for those who didn't continue exercising (p = 0.012). Those who continued exercising spent less overall time in hospital (mean = 5.15 days) than patients who didn't continue to exercise (mean = 20.55), p = 0.0045. **Conclusion:** These results suggest that CHF patients who adhere to an exercise program, whether structured or unstructured, may have reduced cardio-respiratory hospitalisations and time spent in hospital due to cardio-respiratory reasons. **Keywords:** Heart Failure; Cardio-Respiratory; Hospitalisation; Exercise.

ENHANCING PHYSICAL ACTIVITY CLEARANCE: VALIDATION OF A UK VERSION OF THE NEW PAR-Q±

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This workshop will explore current approaches to screening individuals prior to physical activity and reflect upon some of the benefits and challenges of existing approaches. The workshop will provide delegates with an opportunity to hear about the development of the new evidence-based Physical Activity Readiness Questionnaire (PAR-Q plus: Canada 2011) and learn more about the BHF National Centre's international collaborative research to validate a UK version of PAR-Q plus. The workshop will be interactive and provide delegates with the opportunity to review the new PAR-Q plus and explore how it can be used in different contexts and settings. **Keywords:** PAR-Q; Screening; Readiness.

CLASSIFICATION OF SEDENTARY BEHAVIOUR: TOWARD A TAXONOMY

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Sedentary behaviour is now established as a paradigm in its own right distinct from inactivity or lack of engagement in physical activity. There is a body of evidence to show that sedentary behaviours is associated with poor health outcomes and all cause mortality independently of levels of physical activity which is starting to influence policy worldwide. The next phase in sedentary behaviour research is to establish dose response and causality relationship between sedentary behaviours and health, improve understanding of context and determinants of these behaviours. Establishing a taxonomy of these behaviours should be an integral on the process of strengthening and refining the evidence base. We present and open science project dedicated to the development of such classification "Sedentary

behaviour International Taxonomy (SIT).” We discuss the method and the requirement of the taxonomy for modern multidisciplinary and lifespan research.

WALK-SHOP: SUPPORTIVE PHYSICAL ENVIRONMENTS FOR OLDER PEOPLE

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SURFACE Inclusive Design Research Centre, the University of Salford, UK.

Warning – When I am old I shall wear purple walking boots (Jenny Joseph 1961)

I shall sit down on the pavement when I'm tired

...

And run my stick along the public railings
And make up for the sobriety of my youth.

...

But maybe I ought to practice a little now?
So people who know me are not too shocked and surprised
When suddenly I am old, and start to wear purple.

The aim of the Walk-shop is to provide opportunity for participants to reflect on what constitutes a supportive physical environment for older people. We know that the design and maintenance of the physical environment facilitates people's ability to get out and about and in particular, the effective design of the neighbourhood street (Newton et al 2010) can support older people's independence and increase social interaction and community engagement, reducing reliance on care in the home. The walk-shop will provide a gentle exploration either of the indoor *or* external environment, depending on weather. Walk-shop materials will be provided to prompt analysis of design features and to aid discussion. **References:** Joseph, J (1961), Warning. In Larkin, P. (Ed). (1973). Oxford Book of Twentieth Century English Verse. Oxford: OUP; Newton, R., Ormerod, M., Burton, E., Mitchell, L., Ward-Thompson C. (2010), Increasing Independence for Older People through Good Street Design. Journal of Integrated Care. 18, 3. Pp24-29.

THE BEST PRACTICE OF THAI YOGA ON PHYSICAL ACTIVITY AND ACTIVE AGEING

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Thai Yoga, known as Ruesidatdon (Ascetics twisting) in Thailand (Siam), involves a series of active stretching exercises, with active Thai massage, integrated with meditation that affects flexibility and relaxation in promoting a sense of well-being. Workshop includes introducing Thai Yoga: history, definition, physiological effects, principles and techniques, and teaching practical skills. Discussion and demonstration of a typical routine follow by step-by-step instruction of Thai Yoga. Our aim is to determine that participants can do for their health. On the other hand, therapists can integrate into an existing practice for well-being and can get concept for their work in health education and health promotion. The results of the study showed that the teaching/learning of Thai Yoga enhanced elder cooperation. The reflective information provided on-going insights on the effectiveness of teaching/learning activities; thus allowing improvements to therapeutic approaches. **Keywords:** Yoga; Physical Activity; Active Ageing; Health Promotion.

EXERCISE FOR CARDIAC REHABILITATION (BAPCR)Buckley, John¹; Traill, Mima²¹*Department of Clinical Sciences, University of Chester, UK;* ²*BAPCR Council, UK.*

This workshop will cover the basic delivery of a Cardiac Rehabilitation session for patients in the community. The theoretical background, evidence base and a hands on 'how to' session will be interactive to allow the delegates to get a feel for a full-length session.

Posters**CARBOHYDRATE METABOLISM AND ASSOCIATED RISK FACTORS IN OLDER ADULTS**Martins, Raul A¹; Sousa, Nuno M F²; Fonseca, Andreia³¹*University of Coimbra, Portugal;* ²*University of São Paulo, Brazil;* ³*Portuguese Heart Foundation, Portugal.*

Age is associated with several risk factors as increased body fat and abdominal fat, deterioration of the lipid profile, diabetes, raising in inflammatory activity, or decreased functional fitness. Epidemiological evidence suggests that A1C is associated with cardiovascular and ischemic heart disease risk. The aim of this study is to investigate the relationships between A1C and other risk factors like obesity, functional fitness, lipid profile, and inflammatory status in older adults. Data were available from 118 participants aged 65-95 years (72 women and 46 men). Anthropometric variables were taken, as was functional fitness, blood pressure and heart rate. Blood samples were collected after 12 hours fasting, and A1C, hs-CRP, glycemia and lipid profile were calculated. Bivariate and partial correlations were performed as was factorial analysis of variance. Women had higher A1C, glycaemia, TC, BMI, and lower and upper flexibility than men. Men had higher BW, WC, 6-min walking distance, and VO₂peak than women. A1C associated positively with glycemia, HDL-C, TG/HDL-C, BW, WC, BMI, but not with functional fitness, TC, LDL-C, Log10 hs-CRP, PAD, or PAS. Obese participants had higher A1C than non-obese only with IDF but not with USDHHS criteria. Older women had higher A1C than men, even after controlling for BMI. A1C associates equally with BW, BMI or WC. Population-based criteria are recommended to classify obesity and to identify higher levels of A1C in obese older adults. A1C associates with atherogenic dyslipidemia particularly with TG and TG/HDL-C ratio, but not with TC, HDL-C, or LDL-C. A1C is not associated with hs-CRP, and with functional fitness and aerobic endurance. **Keywords:** Metabolism; Obesity; Functional Fitness; Cardiovascular.

FIFE SPORTS AND LEISURE TRUST CARDIAC REHABILITATION CONSULTATION

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Fife Sports and Leisure Trust, UK.

Background: In Fife, the Phase IV Cardiac Rehabilitation Programme is provided in partnership between Fife Sport and Leisure Trust(FSLT)and NHS Fife. This programme has been running for over 12 years. The programme is now reaching capacity, which could result in difficulties in meeting future demand for the programme. **Aims:** FSLT were considering amending the programme offered in order to manage future demand and ensure that both

new and existing clients had access to it. The options under consideration were to reduce the amount of time clients receive the discounted rate for to 12 weeks. On completion of the 12 weeks, they would be signposted to a health class appropriate to their needs. **Methods:** FSLT recognised that this would result in an increase in cost for clients and commissioned a consultation with clients to determine their reaction to the proposed changes. It was hoped that information from the consultation could be used to inform a future service strategy and explore the clients' attitudes towards the proposed changes to the programme. The methodology for this research was developed in order to profile current clients of the programme in order to understand the type of clients who were accessing it and what they were using it for. The aim was to gather the views of a sample of current clients towards the proposed changes and recommend a positive way forward for FSLT, taking into account the needs of the service and the views of the clients. **Conclusion:** The consultation highlighted a number of benefits both for participants themselves, as well as their families, resulting from improvements in health and lifestyle. However, evaluations of programmes such as these often miss out on measuring the wider benefits these interventions can have on participants, their families and wider communities. FSLT have therefore decided to commission a social return of investment that will assess the social, economic and environmental value of the programme. **Keywords:** Cardiac Rehabilitation; Fife; Consultation.

AN EXAMINATION OF THE EFFECTS OF PEER MENTORING IN A PHASE IV COMMUNITY-BASED CARDIAC REHABILITATION PROGRAMME

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Long-term adherence to physical activity (PA) after a cardiac event is uncommon. Research has revealed peer social support, belief in the health benefits of exercise and task specific self-efficacy are necessary for this population to adhere long-term (>6 months) to structured PA (Martin & Woods, 2011). Peer mentoring suggests individuals with similar problems can offer one another a unique resource. This study examined the impact of Peer Mentors (PMs) on adherence of newcomers to an established phase IV Community-Based Cardiac Rehabilitation Programme (CBCRP). **Methods:** Long-term adherers (N = 8, 100% male, 64-77yrs, >12mths attendance) of a CBCRP were trained as PMs. Training (8 hours over 2 days) covered benefits, recommended levels, overcoming barriers, self-efficacy and goal setting for PA. The PM role was to provide support to mentees for a 6-week period. Newcomers to the CBCRP (N = 13, 82% male, 50-77yrs), were recruited and paired with a PM. Outcome measures included attendance rates, assessment of PA level (via accelerometry), psychosocial correlates (mentees only; via self-report self-efficacy, ERA-12, SF-12 questionnaire) and interviews (focus group with PMs, 1-1 interviews with mentees). **Results:** PMs: Key challenges were gauging support required by mentees, assisting exercise mastery, and conflicting input from CBCRP staff. Key recommendations were recruitment of more PMs, female PMs, flexible match period and formalised initial contact. PM PA levels were unchanged. Mentees: The 8 mentees (7male) who were still attending CBCRP at 6-weeks (mean 67% adherence) significantly increased PA levels and reported positive experiences of the intervention. Dropout reasons were injury (N = 2), illness (1), pace too challenging (N = 1) and feeling too young for the class (N = 1). **Conclusion:** The intervention had a positive impact on PMs and Mentees, however, was insufficient to address adherence issue for all mentees; future research needs to examine this issue further. **Keywords:** Cardiac Rehabilitation; Self-efficacy; Peer Mentoring; Adherence.

EXERCISE AND NON-EXERCISE PREDICTION MODELS OF AEROBIC POWER BY SIX-MIN WALK TEST IN OLDER MEN

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Purpose: To develop both peak aerobic power (VO₂peak) and distance prediction models using body mass (BM), body mass index (BMI), body fat (FAT), distance (D), body weight-walking distance product (DxW), and maximum heart rate (MHR) in healthy older men.

Methods: We measured body composition (BM, BMI, FAT) and peak aerobic power breath-by-breath during both cardiopulmonary exercise testing (CPET [velocity, heart rate and VO₂ at anaerobic threshold and peak]) and six-min walk test (6MWT; [D, DxW, heart rate and VO₂ at peak]) in 76 healthy older men aged 65 to 80 years (69.1 ± 0.3). **Results:** We observed significant correlations for VO₂peak at 6MWT as a function of DxW ($R = 0.75$, $P < 0.0005$), BM ($R = 0.56$, $P < 0.0005$), D ($R = 0.43$, $P = 0.0004$) and maximum heart rate (MHR [$R = 0.37$, $P = 0.001$]); distance was significantly correlated with FAT ($R = -0.43$, $P = 0.005$), BMI ($R = -0.36$, $P = 0.021$) and age ($R = -0.31$, $P < 0.045$), whilst DxW with BM ($R = 0.86$, $P < 0.005$). The inclusion of DxW raised the R² from 0.65 to 0.74 and decreased the estimative error yielding the following equation ($R = 0.86$, SEE = 182.1 mL/min-1, $P < 0.0005$) for predicting VO₂peak, i.e., $\text{VO}_{2\text{peak}} = 962.2 + (0.037 \times \text{DxW}) + (8.565 \times \text{MHR})$. A non-exercise model was yielded by univariate regressions, but not for multiple regressions. Body fat percentage ($R = 0.43$, SEE = 702.2 m, $P < 0.005$) yielded the best model for predicting distance, i.e., $\text{distance} = 702.2 - (3.067 \times \text{FAT})$. **Conclusion:** Our prediction model seems to be an accurate strategy to estimate VO₂peak in healthy older men, mainly when DxW is considered. On the other hand, other studies should develop non-exercise models, especially based on DxW. **Keywords:** Exercise; Aerobic; Body Composition; Cardiopulmonary.

PREDICTION OF MAXIMAL HEART RATE IN MASTER CYCLIST AGED 40 TO 60 YEARS OLD

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Introduction: Maximal heart rate (MHR) is an important physiologic variable that is used as a guide to estimate effort and is also used as the basis for exercise prescription. An accurate predictor of MHR is necessary to prescribe safe and effective exercise in cyclist. To date, accuracy of MHR prediction in cyclist has not been well established. The purpose of this study was to develop a specific equation for predicting MHR in cyclist aged 40 to 60 years old, and compare with Tanaka and ACSM equations. **Methods:** One hundred thirty-one cyclist [Age: 46.41 ± 4.98 years; Body mass 73.11 ± 8.55 kg; Height : 169.54 ± 6.46 cm, BMI: 25.40 ± 2.28 kg/m² and fat mass : $23.86 \pm 4.33\%$; Training load : 8372 ± 3429.6 km per season], performed a graded maximal exercise test in a mechanical cycle ergometer (Monark 818E, Sweden) for cardiovascular assessment and aerobic exercise prescription. A total of participants met conditions for achieving maximal exercise testing criteria and were included in this study. M values were determined by electrocardiography and with a cardiomonitor Polar 610 (Finland). The mean data are presented \pm SD. Maximal Heart Rate was considered

as dependent variable and age as independent variables. To compare maximal heart rates and predicted eq. a Student's paired t-test were used. Spearman correlation coefficients were performed to assess relationships between heart rate values. In all cases, a $p < 0.05$ was determined as significant. **Results:** An inverse relationship were found between MHR and age ($R^2 = 0.31$, $p < 0.0001$) a derived equation was $MHR = -1.5592 (\text{Age (y)}) + 246.8$ (Spearman correlation coefficient between predicted equation and MHR obtained in graded exercise test was significant ($Rho: 0.53$, $p < 0.001$) No significant differences were found between Alvero's prediction eq and MHR (diff: -1.96 ± 11.62 , 95%CI : -3.97 to 0.039). **Conclusion:** A predicted equation can be used to estimate maximal heart rate in master cyclists. **Keywords:** Cardiovascular; Cycling; Heart Rate; Prediction.

LONG-TERM EFFECTS OF A SUPERVISED EXERCISE PROGRAMME ON QUALITY OF LIFE IN PERIPHERAL ARTERIAL DISEASE

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Aim: Peripheral arterial disease (PAD) is a chronic, progressive disease with a significant impact on quality of life (QoL). The main aim of treatment is maintenance or improvement in QoL by eliminating ischaemic symptoms and preventing progression to vascular occlusion. The use of patient-based measures of treatment effects including disease-specific QoL questionnaires has been recommended. The aim of this study was to determine the long-term (two -year) effects of a supervised exercise programme on QoL in patients with PAD. **Methods:** Patients with an ankle: brachial index (ABI) < 0.09 were identified from the Non-Invasive Vascular Laboratory Logbook. Following informed consent and successful completion of a treadmill exercise test, patients were randomised to a control and an exercise group. The control group received usual care. The exercise group participated in a twice-weekly supervised exercise programme for 12 weeks. Data regarding quality of life (Intermittent Claudication Questionnaire [ICQ]) was collected at baseline, 12 weeks, one year and two years. **Results:** Forty-four participants were randomly allocated to a control ($n = 16$) or an exercise ($n = 28$) group. Data was collected on 31, 30 and 23 participants at 12 weeks, one and two years respectively. There were no significant differences between the groups at baseline for ICQ scores. At 12 weeks there was a trend towards improved QoL in both groups greater in the exercise group ($p = 0.066$). At two years post-participation, ICQ scores in the exercise group were still lower than baseline (mean 34.66 v 31.67) reflecting improved QoL while ICQ scores in the control group indicated a continuing deterioration in QoL (mean 34.14 v 42.39). **Conclusions:** Results of this study provide evidence for the long-term effectiveness of supervised exercise. This study delivered an exercise intervention only. A more comprehensive multi-disciplinary cardiac rehabilitation programme may confer additional benefits. **Keywords:** Exercise; Peripheral Arterial Disease; Quality of Life.

IMPACT OF PHYSICAL ACTIVITY BY WALKING ON CARDIOVASCULAR HEALTH AMONG OLDER PEOPLE

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Purpose: Walking is suggested to be offering health gains. The World Health Organization recommended walking for at least thirty min daily to maintain individuals' health. Moreover,

it is recognized that walking promotes cardiovascular health, especially for the older people. The purpose of this study is to identify the impacts of physical activity walking on cardiovascular health from current literature. **Methods:** A review of literature was adopted in this study. Literature related to the topic between years 2007-2012 was searched using the following databases: PubMed, ProQuest, Medline, Cinahl and Embase. Results focusing on the impact of physical activity by walking on cardiovascular health were retrieved and reviewed. **Results:** The review of literature showed significant impact of walking on cardiovascular health. Walking programs were well tolerated by patients with chronic disease and walking maintained or increased the cardiovascular function of these patients. The cardiorespiratory fitness was suggested to be improved among diabetes patients who joined for a 24 weeks walking intervention. Also, individuals with low walking speed were identified to have an increase risk of cardiovascular death. Moreover, an increase in walking steps per day could decrease the systolic and diastolic blood pressure that reduce the morbidity and mortality related to cardiovascular disease. **Conclusion:** It is concluded that walking contribute to cardiovascular health. Thus, it is recommended that health promotion targeting on increasing the walking level among older people should be encouraged as to improve cardiovascular health. **Keywords:** Physical Activity; Cardiovascular; Walking; Diabetes.

EFFECTS OF REGULAR PHYSICAL EXERCISE AND DIETARY INTAKE ON ANTIOXIDANT STATUS AND CARDIOVASCULAR RISK IN ELDERLY WOMEN

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The decline of metabolic function in elderly increases the risk of oxidative stress, leading to cardiovascular diseases. Adequate physical activity and well-balance diet would help to reduce this risk. This study aimed to compare regular physical exercise effects and biomarkers in blood including antioxidant status and the risk of cardiovascular disease markers in relation to dietary intake. A cross-sectional study was conducted in sedentary elderly women (SE, n = 17), exercising elderly women (EE, n = 26), sedentary young women (SY, n = 37) and exercising young women (EY, n = 12). All exercising women had exercise activity at least 3 hours/week for a year. All participants completed 4-day dietary intake records. Blood was collected on day 5. Factorial ANOVA tests were done regarding to elderly and exercise status. We found that total antioxidant status (TAS) and cardiovascular risk marker -homocysteine (tHcy)- in plasma were significantly and independently dependent on elderly and exercise status. Elderly group had higher TAS and tHcy, compared to young group ($p < 0.01$). EE had higher TAS compared to SE, EY and SY ($p < 0.001$), and higher antioxidant enzyme - erythrocyte glutathione peroxidase activity - compared to SY and EY ($p < 0.05$). SE had higher tHcy compared to EE, EY and SY ($p < 0.01$). We found that TAS in plasma was related to daily vitamin C intake ($r = 0.231$, $p = 0.026$), while tHcy was related to the decrease of plasma HDL concentration ($r = -0.269$, $p = 0.015$). No differences were shown on lipid peroxidation marker (TBARS), plasma ascorbate, erythrocyte superoxide dismutase activity. In conclusion, elderly women had higher risk of cardiovascular diseases compared to younger women. However, regular exercise would help to reduce the risk of cardiovascular diseases and increase antioxidant protection status in elderly women. **Keywords:** Exercise; Diet; Cardiovascular; Stress; Physical Activity.

BIOPHYSICAL ASSESSMENT PROTOCOL IN A HEALTHY EXERCISES PROGRAM FOR SENIORS

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Enjoyment of exercise is one of the health benefits that can be obtained when someone starts planning functional exercise. The constructive use of leisure through sports and recreational activities promotes assessment and activity monitoring. Before doing any sport or physical activity (PA), a person must agree to perform a series of assessments, to make PA safer and personalized. There are usually no evaluation (nutritional, postural, biomedical, physical attributes) prior to PA initiation in adults. **Methods:** People (enrolled in the program over 55 years at the University of Malaga, Spain) were evaluated through monitoring the biophysical attributes. We reviewed the family and personal history. Doctor assessed through traffic light colours (red, orange and green) the following parameters: age, sex, weight, height, waist-hip ratio, blood pressure, resting heart frequents; and tests: dynamometry of hands, taping hands, balance, step test, vertical jump, jump length, throwing the ball, speed test circuit, test obstacles. Finally, our team developed a functional PA program to improve the results of initial tests. **Aims:** To create a new PA program with some functional exercises. Depending of the level of PA of the person, it assigned one traffic light colour (red, orange, green). **Results:** In the pilot study, we improved biomedical variables and we have designed an evaluation sheet for the persons. 15% of the subject didn't know they have health problem such as overweight or high blood pressure. Our design, where we highlight the use of a color scale to the person, liked all people and they improve their motivation to PA. **Conclusion:** PA can not only reduce the risk of disease, but to be an effective tool to improve the health of the person. To prescribe a functional exercise is necessary to know its biological and fitness status. **Keywords:** Biophysical; Exercise; Seniors;.

PERSONAL TRAINING FOR OLDER ADULTS TO BE ACTIVE AND HEALTH PEOPLE

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Cardiovascular diseases (CVDs) are the first cause of death. People can reduce their risk of CVDs by engaging in regular physical activity. Exercise can improve and prevent chronic diseases suffered by people. **Purpose:** To explore the improvement of the physical qualities. **Methods:** 58 subjects (22 males and 36 female), with range age were 44-76yrs, participating during 12 months period. They were divided into 2 groups: back school (BS) and therapeutic group (T). Each case was compared with its previous control at the beginning of the personal training activity. Information on exposure to risk factors was obtained by a structured questionnaire. Data were collected in our sport medical complex (weight, height, body mass index (BMI), waist hip index, blood pressure and resting heart rate). They developed some tests: hand dynamometry, arms tapping, vertical and horizontal jump, ball launching, step test, speed and Ruffier test. **Results:** Significant differences were found between T and BS groups ($p < 0.05$). Data in T group were in blood pressure, weight, height, BMI, waist-hip index and Ruffier index test in males: 15.7 ± 1.4 and 8.6 ± 0.9 mm Hg; 83.9 ± 0.8 kg; 1.67 ± 0.01 m; 30.02 ± 0.05 kg/m²; 1.04 ± 0.1 m; 5.40 ± 1.5 points; respectively, and in females: 13.3

± 1.7 and 8.0 ± 0.2 mm Hg; 73.6 ± 9.7 kg; 1.60 ± 0.10 m; 30.0 ± 7.5 kg/m²; 0.70 ± 0.10 m; 5.20 ± 6.3 points; respectively. Data in BS group were in blood pressure, weight, height, BMI, waist-hip index and Ruffier index test in males: 13.7 ± 2.3 and 8.1 ± 0.62 mm Hg; 86.0 ± 11.6 kg; 1.70 ± 0.08 m; 29.1 ± 3.31 kg/m²; 1.00 ± 0.05 m; 9.8 ± 3.4 points; respectively, and in females: 12.5 ± 1.12 and 7.6 ± 0.67 mm Hg; 66.2 ± 11.5 kg; 1.60 ± 0.07 m; 25.63 ± 1.32 kg/m²; 0.86 ± 0.07 m; 10.4 ± 4.6 points. **Conclusion:** Our results confirm the importance of therapeutic group sport activities. Specific programs improved CVDs risk such as blood pressure and Ruffier test. **Keywords:** Personal Training; Physical Activity; Chronic Diseases; Blood Pressure.

CHEST HEART & STROKE SCOTLAND ADVICE LINE: A GATEWAY FOR CINDERELLA TO RETURN TO THE BALL!

Hastings, Laura; Hay, Becky; Garlick, Edie; Inch, Susan

Chest Heart & Stroke Scotland, UK.

Chest Heart & Stroke Scotland (CHSS) Advice Line nurses provide information, advice and support to patients and carers living with chest, heart and stroke illness in Scotland, and health professionals. The Advice Line is accredited with The Helplines Association. Chronic Obstructive Pulmonary Disease (COPD) is often seen as a "Cinderella" condition in an ageing population. Life may not be a ball with COPD, but the Advice Line nurses support people to improve their quality of life with self-management strategies and physical activity. CHSS Advice Line nurses answer telephone calls and enquiries by email, text message and through Facebook and Twitter. Providing a supportive, listening ear with no time limit to calls, they give confidential, practical and independent information and advice based on up-to-date Scottish and UK guidelines (eg. SIGN and NICE). Ella (age 70) was diagnosed with COPD and phoned the Advice Line feeling anxious and frequently breathless. Previously Ella had enjoyed going dancing with her husband Harry but with COPD, she believed her dancing days were over. The Advice Line nurse: answered Ella's questions and advised her how to cope with breathlessness and fatigue, and prevent chest infections; recommended Ella ask her GP for referral to a pulmonary rehabilitation class; sent her CHSS booklets and factsheets, and a DVD of COPD exercises; referred her to a CHSS chest group for weekly exercises and social support. Ella felt rejuvenated by being more active and soon joined Chest Voices Scotland to help shape her local respiratory health services. The Advice Line nurse referred Ella to the CHSS Personal Supports Grants Officer, she received a holiday grant, and once again she danced with Harry. The Advice Line was the gateway through which Ella improved her life, enabling and empowering her to manage her COPD and actively change her from a state of breathlessness and anxiety to dancing away the afternoon with her Prince Charming! **Keywords:** Helpline; Chronic Obstructive Pulmonary Disease; Scotland.

HYPERTENSION IN OLDER ADULTS: PERCEPTIONS OF MORBIDITY AND FACTORS ASSOCIATED WITH TREATMENT

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High Blood Pressure (HBP) is a disease of slow clinical and asymptomatic nature, which often is associated with functional changes, structural changes in target organs and metabolic changes, with consequent increased risk of cardiovascular events. HBP is a disease that most stands out among the elderly in Brazil, with ratios around 50% and in the adult population,

an estimated prevalence of around 20%. Changes in lifestyle are effective in the prevention and control of HBP, with improved antihypertensive efficacy and reduced cardiovascular risk associated. The study objective was to estimate the prevalence of hypertension in the elderly in the municipality of Jaborandi / SP, assessing sociodemographic, clinical, physical activity and quality of life (QOL). It is a descriptive cross-sectional survey that used the questionnaires as instruments: Mini Mental State Examination; Demographic, socioeconomic and clinical; Baecke modified for the elderly and hypertensive-specific QOL. The variables were analyzed by Fisher's Exact Test, considering significant $p < 0.05$. We evaluated 82 elderly, 48 women (58.54%) and 34 men (41.46%), most of the age group 60-69 years (45.12%), Caucasian (84.14%), with low educational level (mean 3.01 years of schooling), low income: Class D (54.88%) and class E (31.71%) and 82.93% of elderly retirees. The prevalence of HBP was 75.60% (77.08% in women and 73.53% in men). Significantly associated variables: HBP by waist circumference (.011), HBP and medication by Classification of blood pressure (BP) (< 0.001), HBP by private health plan (0.03), QOL by poor mental health in 30 day (0.032), QOL by Alcoholism (0.023), QOL by Smoking (0.005) and QOL by Number of drugs in use in 3 months (0.018). The results indicated that health education is essential for the patient, being instructed on the principles on which it is based treatment can exercise adequate control of BP aiming at a better quality of life. **Keywords:** Hypertension; Perceptions; Morbidity; Treatment; Physical Activity.

SPINAL MOBILITY AND LUNG FUNCTION: THE ACUTE EFFECT OF PILATES ON VITAL CAPACITY

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Background: As people age, their spine and rib cage progressively increase in stiffness, with concurrent increases in kyphotic posture. These changes can limit the maximum voluntary expansion of the lungs, and thus decrease overall lung function. Exercise has been shown to increase mobility of the spine and rib cage and may improve lung function. Pilates is a program of exercise that may improve spinal flexibility, but the immediate effects of this program on lung volumes has not been investigated. **Method:** Older adults (66 ± 6 yrs) who were currently enrolled in a Pilates program were recruited to participate in this study. Participants attended for a familiarization session and then one week later attended for testing. Height, BMI and lung volume (as measured by vital capacity VC) pre and post a single 60 min Pilates training session were measured. Paired t-tests were undertaken to compare VC measurements (pre and post) using Microsoft excel. **Results:** 17 adults (4 male) consented to participate in the study. These adults had been participating in Pilates classes at least weekly for a minimum of 6 months. Mean volumes (SD) were 3.3L (0.9) pre and post class with no differences ($P = 0.382$) recorded. As a group, mean VC was 114.35% (SD 15.9) of the population norms. **Discussion:** No significant differences were observed in vital capacity pre and post a single Pilates session. It may be that improvements in thoracic cage and spine mobility require longer term interventions to produce results. Alternatively, this population may have already had improvements in their spinal mobility, as lung volumes were higher than population norms. **Conclusion:** One Pilates session does not appear to significantly change lung volumes in a population who have already been participating in Pilates. Further research into longer term effects of Pilates in older adults who do not have experience in Pilates is warranted. **Keywords:** Kyphotic Posture; Lung Function; Pilates; Flexibility.

EFFECT OF SELECTED EXERCISES ON PHYSICAL, PHYSIOLOGICAL AND PSYCHOLOGICAL VARIABLES AMONG MIDDLE AGED WOMEN

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Introduction: India had seen a woman only as a member of the family or a group-as daughter, wife, or a mother and not as an individual with identities or rights of her own. Today's Indian women are more independent and conscious of their need to be physically fit, mentally alert and emotionally stable. A sound exercise programme throughout life can reduce some of the common effects of ageing. The present study assessed the effect of selected exercises (12 weeks) on hundred middle aged women, between 50-60 years with a mean and SD of 54.55 ± 3.46 , selected at random from Varanasi, India. It was hypothesized that there would be significant differences on physical, physiological and psychological variables due to the training. **Method:** Standardized tests were applied to measure physical (flexibility, cardiovascular endurance, muscle strength, static balance, reaction time, speed of movement and frequency of movement), Physiological (resting pulse rate, blood pressure, vital capacity, resting respiratory rate, fat percentage, breath holding capacity and blood sugar level) and psychological (anxiety [Sinha's Anxiety Scale] and depression [Beck's depression Inventory] variables. **Results:** Analysis of Co-Variance (ANCOVA) was applied and tested for significance at 0.05 level of confidence. Significant difference was found in flexibility, cardiovascular endurance, muscle strength, static balance, reaction time, speed of movement and frequency of movement for experimental group. Further resting pulse rate, blood pressure, vital capacity, resting respiratory rate, fat percentage and breath holding capacity of experimental group had improved. Finally in the component of psychological variables the present sample improvement upon anxiety management and reduced depression. **Conclusion:** The present finding is an eye opener for Indian women to realize the significance of exercise in their life and live a dignified life at a later stage. **Keywords:** Exercise; Physical; Physiological; Psychological.

MODIFIED THAI YOGA ON A DAILY BASIS AND ITS BENEFICIAL EFFECTS ON CARDIOVASCULAR SYSTEM

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Thai Yoga (TY) is related to mind-body exercise; Yoga and Tai Chi which are already accepted having therapeutic value. Traditionally, TY is held to result in functional integration at the highest level of spirituo-psycho-somatic development in the mind and brain simultaneously. In order to examine which brain regions change activation in response to exercise, the application of different neuroimaging techniques would be beneficial as a promising oxygen consumption for investigating the effects of exercise on cardiovascular systems. The aim of this study was to evaluate the acute effect of a single bout of TY on cardiovascular systems. Subjects were asked to get expired-air that was used to obtain oxygen consumption (VO_2), respiratory rate (RR, time/min), tidal volume (V_t , L) and Min ventilation (VE , L/min). Mean scores were reported for each of the eighteen poses involved in TY. These findings have practical implications for improving modified Thai Yoga for people, and conducting programs on a daily basis. The most people could consider their pose the most suitable place to practice modified Thai Yoga that the postures were useful because the activity integrated

processes in a practical way, and also promoted effective breathing. **Keywords:** Thai Yoga; Cardiovascular; Oxygen Consumption; Exercise.

EFFECTS OF A 12-WEEK MULTI-COMPONENT EXERCISE INTERVENTION ON PHYSICAL AND BIOMETRICAL COMPONENTS IN ASSISTED-LIVING RESIDENTS

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Introduction: Exercise can be an important contributor to the health of elderly adults. The study aims at measuring change in strength, agility, balance, and biometric components of assisted-living population exposed to a 12-week multi-component exercise intervention.

Methods: Twenty-four elderly adults (Mean age = 84+7 years) from two separate assisted-living facilities were randomly divided into an intervention and control groups. Variables of interest were upper body strength, agility, balance and biometric measures (Total Cholesterol, HDL, LDL, TRG, TCHDL, and Glucose). Intervention subjects practiced bi-weekly, 45-60 min each session. **Statistical Analysis:** Repeated measures ANOVAs (group x pre-post) were performed for each variable, and standardized effect sizes (SES) were computed to estimate intervention effect. **Results:** Moderate to strong SES were revealed for the modified Berg Balance (SES = .49), Chair Sit-and-Reach (SES = .31), 8ft Up and Go (SES = .57), 2minWalk-in-Place (SES = 1.02), T. Chol (SES = 0.41), HDL (SES = .40), LDL (SES = .43), and TRG (SES = -1.27), but not for the other variables. The group by time interaction significance level for the above variables ranged between $p = .09$ -.20 due to sample size.

Discussion: Findings indicate that during structured intervention meaningful and positive physical and biometrical changes can be obtained in the elderly population. Results should be interpreted with caution due to small sample size that resulted in insufficient power for obtaining significance. More studies are required to infer generalizability. **Keywords:** Intervention; Physical and Biometrical Components; Elderly; Balance.

IS BODY MASS INDEX ASSOCIATED WITH 3-YR CHANGES IN PHYSICAL CAPACITY IN WELL-FUNCTIONING OLDER INDIVIDUALS: THE NUAGE STUDY

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Background: Forty% of Canadians >60 years old report at least one type of physical disability; mobility impairment being the most common. In addition, the prevalence of overweight and obesity in older adults is increasing. In comparison to their normal weight counterparts, older obese individuals are at greater risk of impaired physical capacity. However, few longitudinal studies have explored the association between body mass index (BMI) and changes in physical function in older individuals. **Objective:** To investigate the association between baseline BMI and changes in physical capacity over 3 years. **Research methods:** Data from 342 well-functioning older men aged between 68 and 82 yrs from the longitudinal study NuAge were analyzed. Dependent measures were the changes in physical capacity tests. Regression analyses were performed to investigate if baseline BMI was associated with changes in physical capacity over 3 yrs after controlling for age, Short Form Health Survey questionnaire (SF-36), functional autonomy, physical activity

scale for elderly (PASE), number of diseases, and waist circumference. **Results:** Baseline BMI ranged between 17.2 and 51.2 kg/m² (mean = 28.1 ± 4.2 kg/m²). Mean changes in the results of the physical capacity tests were significant over 3 years follow up: time up and go (M = 0.48; SE 0.11), chair stand (M = 0.99; SE 0.20), walking speed at fastest pace (M = -0.04; SE 0.01), and one leg stand (M = -4.62; SE 0.92). Before and after adjustment for potential confounders, no significant association was observed between baseline BMI and changes in physical capacity after the 3-year follow-up (R² between 0.0009 and 0.0123). **Conclusion:** Our data showed that baseline BMI was not a predictor of changes in physical capacity in our cohort of well-functioning older men. However, 3 years is a short period of time to evaluate the effects of BMI on physical capacity, longer studies would be needed to clarify these findings. **Keywords:** Body Mass Index; Physical Capacity; Autonomy; Speed.

HAPPINESS IS A DETERMINANT OF PHYSICAL ACTIVITY LEVELS AMONG ETHNICALLY DIVERSE OLDER ADULTS

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Background: Identifying the determinants of physical activity is becoming increasingly important as the population of Canada ages. Physical inactivity is associated with functional limitations and chronic disease. While depression and stress levels are associated with lower levels of physical activity, little is known about the influence of happiness on physical activity levels, particularly among ethnically diverse groups. **Purpose:** To determine whether happiness is a determinant of physical activity among an ethnically diverse group of older adults living in an urban center in Canada and to examine sex differences in this relation. **Methods:** Data from an ongoing intervention study were used for purposes of the current analysis. Participants were men (n = 30) and women (n = 136) between the age of 55-87 who lived in low-income urban neighbourhoods. Upon recruitment in the study, all participants completed the Subjective Happiness Scale (SHS), the Healthy Physical Activity Participation Questionnaire and provided relevant demographic information. Multiple linear regression models were performed using physical activity as an outcome and SHS as the main exposure variable. Age, sex, marital status and education were controlled for in fully adjusted models. **Results:** Fully adjusted models accounted for 15% of the variance in the overall sample, 54% of the variance among males and 14% of the variance among females. A significant and positive association between physical activity and happiness was noted in the overall sample (beta = 0.34), males (beta = 0.83) and females (beta = 0.24). **Conclusions:** Subjective happiness is a determinant of physical activity levels among ethnically diverse older adults with a stronger association for males compared to females. As such, focusing on improving happiness in this population, particularly among men, may be essential for lifestyle change. **Keywords:** Happiness; Physical Activity; Ethnicity; Urban; Sex.

INDIVIDUALLY ADJUSTED PHYSICAL ACTIVITY FOR INACTIVE ELDERLY PERSONS, INVITED TO A "HOUSE OF HEALTH" SETTING: AN RCT

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There is overwhelming evidence showing that physical activity is crucial for health and physical function in old age. Consequently, it is extremely important to reach people at risk of functional decline in time. The concept Control of Function in a House of Health setting

focuses on both physical and social activities. The aim of this study was to describe the effect of individually tailored advice and physical training, within the concept Control of Function, on activity patterns, endurance, quality of life and consumption of care in inactive elderly people. **Methods:** Sixty persons were randomized to either intervention or control group. Criteria of inclusion: Age ≥ 75 years, living in the community, able to walk and manage stairs, low level of physical activity. Criteria of exclusion: Severe health problems, need of help with ADL. Activity level (six-grade scale, FAI), endurance (six min walking test), falls efficacy (FES-I) and quality of life (SF36) were evaluated at baseline and after six months of intervention, and consumption of care after another year. The intervention, based on a check up by a physiotherapist followed by goal setting together with the participant, included training programmes and activities, also social. Training facilities were offered in the house, i.e. gym and group activities, but also in the community, and continuous follow-ups were performed. **Results:** The intervention group improved significantly more than the control group regarding endurance, and positively changed their attitude towards exercise to a significantly greater extent. Consumption of care is still to be followed up and will be presented at the congress. **Conclusion:** The results demonstrate positive effects of the concept Control of Function in a House of Health setting, but more studies with a greater number of participants are needed. **Keywords:** Physical Activity; Function; Endurance; Quality of Life.

A PROFILE OF OUT-OF-HOME MOBILITY AND USE OF NEIGHBORHOOD ENVIRONMENTS FOR SENIORS IN TAIWAN

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The potential losses and physiological changes associated with aging may hinder the mobility of older adults. However, as mountain of evidence has demonstrated, regular physical activity is strongly related to the health of seniors, especially physical activity that is a natural part of their lifestyle, and therefore, it is crucial to understand the motives for out-of-home mobility with regards to the daily activities of seniors. This study presents a profile of out-of-home mobility that includes the motives for going out and the frequency of each trip, combined with an evaluation of the neighborhood environment and the utility. A valid total of 155 voluntary older adults from Tainan city, Taiwan, participated in this study. The results revealed that exercise is the top motive for out-of-home trips, followed by social activities and doing grocery shopping. The most popular sites for doing leisure-time physical activity are parks. The participants reported that they visit parks in a very regular basis and that they generally walk to parks by themselves, with most of them staying in the park between a half hour and one hour. Implications are provided in terms of methods to enhance the mobility of older adults. **Keywords:** Neighborhood; Physical Activity; Motives; Mobility.

CAUSAL RELATIONSHIPS BETWEEN SOCIO-ECONOMIC STATUS, PHYSICAL HEALTH AND LONG-TERM CARE NEEDS AMONG THE JAPANESE URBAN ELDERLY

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Introduction: After the Japanese government implemented public long-term care (LTC) insurance in 2000, the demand for LTC services has steadily increased. This chronological

study aimed to explore the causal relationships between socio-economic status (SES), physical health and LTC needs among the urban elderly in Japan. **Methods:** A questionnaire survey was conducted to all residents aged 65 years and older in an urban Newtown area of Tokyo in 2001 and a follow-up study was conducted in 2004. In all, 7,905 respondents to both surveys were included as analysis subjects. Data analysis was performed using Chi-squared test and Structural Equation Modeling (SEM). In the SEMs, one observed variable (LTC needs in 2004) and three latent variables (SES in 2001 and physical health in both 2001 and 2004) were used. **Results:** Among all variables, physical health in 2004 was the strongest determinant of LTC needs, followed by physical health in 2001 and SES in 2001. The results also indicated that the indirect effect of SES on LTC needs via physical health in 2001 and 2004 was higher than the direct effect. The final model fitted the data well: NFI = 0.982, CFI = 0.983 and RMSEA = 0.044, and showed that the LTC needs explained by SES in 2001, as well as physical health in both 2001 and 2004 were large ($R^2 = 0.67$). **Conclusions:** Our results indicated that good physical health directly contributed to reducing LTC needs among Japanese elderly. In addition, efforts to increase income and educational levels may to decrease LTC needs by indirectly improving physical health. **Keywords:** Socio-economic; Health; Urban; Japanese; Causal Relationships.

AGEING AND HEALTH ON A GENDER PERSPECTIVE: A STUDY ON NATIONAL HEALTH SURVEY (NHS) DATA IN PORTUGAL

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The aging population brings new challenges related to health. One question concerns gender, that is, the different health conditions of men and women and how they manage strains and mobilize resources, as they get older. Gender refers to the culture-bound convention about norms for – and relationships between – women and men, and affects most areas of human existence, including health. In the analysis of equity in health and health care use, gender points out to a particular kind of inequity, which results from wider inequalities such as social, economic, cultural or other that exist between women and men. The health status of people in later life depends, in part, on the health capital built up over a lifetime, but also on the resources, capacities and in the individual current context. Therefore, it is appropriate to identify and analyze the similarities and differences in health needs between men and women, as well as identify and analyze the gender-based obstacles that prevent women and men from realizing their potential health. This research aims at determining and analyzing the relevance of gender on health status and health care utilization of the population above 50 years old, in Portugal, based on the data of the National Health Survey (NHS), which provides population representative data in health. In search for relevant associations between these demographic, social and economic characteristics and men and women's health status and use of health care, health typologies will emerge, representing specific population groups. This research will be complemented later by qualitative data gathered from in-depth interview that explore particular aspects of this phenomenon, and provide different information and knowledge on the same subject. A gender analysis in health and in health care among Portuguese above 50 years old may provide fundamental and practical

answers to this issue and provide knowledge, to adequate public policies and improve quality in services. **Keywords:** Health; Gender; Portugal; Cultural; Economic.

IMPACT OF AGEING WELL: A LOTHIAN WIDE PEER SUPPORT PHYSICAL ACTIVITY AND WELLBEING PROJECT FOR INACTIVE ADULTS AGED 50+

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Introduction: By 2033, the predicted increase in the pensionable aged population in the Lothians is 41.03%, 9.63% above the projected Scottish average. This will have an impact on NHS and public services given the preventable nature of many long-term conditions and the increasing use of services by 45-75 year olds. Good physical and mental health, quality of life and the ability to live independently are closely linked. The 2010 Scottish health survey reports low levels of physical activity (<30 min of moderate or vigorous activity per week) in the 65+ demographic; 46% of men aged 65-69, 84% aged 85+, and 44% and 91%, respectively, with older women. **Project:** Ageing Well is a Lothian wide project aiming to maintain and promote physical and mental health and wellbeing and quality of life for inactive adults aged 50+. Physical activity is a key component. Over 1000 individuals take part annually. It is a peer support model where volunteers lead, encourage and provide information to aid their peers in adopting a more active and healthy life. **Impact:** Preliminary findings of a recent Social Return on Investment study show that the programme achieves a social impact of at least £435k (final report March 2012). Evaluations have shown that 85% of participants positively changed their attitude towards physical activity; 72% positively changed their behaviours; 79% had improved health and wellbeing; 88% of volunteers had improved health, 91% believed the programme enabled them to meet new people and 100% would recommend volunteering to others. A 2010 survey showed that 37% of participants met the recommended 30 min of physical activity most days, 26% above the aged 65+ Scottish average. Participants reported increased confidence, reduced social isolation and improved mental health. **Conclusion:** Ageing Well has shown to be an effective programme to improve the health and wellbeing of its participants and volunteers, increasing PA levels and reducing social isolation. **Keywords:** Physical Activity; Wellbeing; Inactive; Mental Health; Isolation.

ENVIRONMENTAL FACTORS AFFECTING ELDERLY PHYSICAL ACTIVITY LEVEL: A REVIEW FROM URBAN PLANNING PERSPECTIVE

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Physical activity (PA) is a strategy to improve quality of life. There is a plethora of studies that strive to discover crucial factors affecting level of PA in different sectors of society. This review aims to provide a holistic view of factors affecting elderly PA from urban planning perspective. A methodical literature search through scientific databases resulted in inclusion of 25 main articles. Various aspects (individual and environmental) of improving elderly PA level have been considered in these researches with predominant approaches from health and medicine disciplines in a disjointed fashion. However, close scrutiny from urban planning perspective reveals that the impacts of other environmental factors in micro and macro urban scale have been overlooked. At micro scale, urban design factors like enclosure, human scale, and legibility on elderly PA level have been neglected. Also, at macro scale, the impacts

of environmental variations in different parts of the city on elderly PA level have not well established. In this regard, the relation between environmental equality, as a fundamental factor which affects vulnerable people health, and elderly PA level has not been addressed in reviewed studies. **Keywords:** Physical Activity; Environmental; Urban; Vulnerable.

YOGA IN THE PREVENTION AND SELF MANAGEMENT OF THE CONDITIONS ASSOCIATED WITH OLD AGE: 1. STANDING POSES

Agarwal, Shashi

Agarwal Health Center, United States

Introduction: Yoga is practiced by millions all over the world. Having being practiced for more than 5000 years in India, its popularity in the West has steadily grown given its extensive health benefits. These include improved flexibility, strength, posture, mood, concentration, and relaxation. Medical benefits are seen in hypertension and other cardiovascular diseases, asthma, arthritis, insomnia, depression and many other health conditions. The Yoga Sutras (aphorisms) describe eight limbs of yoga practice: yama (moral behavior); niyama (healthy habits); asana (physical postures); pranayama (breathing exercises); pratyahara (sense withdrawal); dharana (concentration); dhyana (contemplation); and samadhi (higher consciousness). Commonly practiced yoga sutras in the western world include physical postures, breathing exercises and meditation. **Methods:** Several hundred yoga poses were reviewed from several yoga texts. Twenty simple postures with the most benefit and safety for seniors were picked for this four-poster presentation. **Results:** The following five standing poses should be done first in this four-sequence yoga session. These postures will be illustrated and their mode of performance and benefits described in the poster: 1. Mountain Pose (Tadasana) 2. Tree Pose (Vrksasana) 3. Triangle Pose (Trikonasana) 4. Warrior I Pose (Virabhadrasana I) 5. Warrior II Pose (Virabhadrasana II). **Conclusion:** Selected yoga postures can be regularly performed by the elderly. Yoga can be an excellent active method in the prevention and self-management of the conditions associated with ageing. It is simple to learn, easy to perform and is virtually free of any harmful effects. It has been associated with excellent adherence. Regular performance of these postures can be highly rewarding in the elderly. **Keywords:** Yoga; Self-Management; Meditation; Breathing; Standing.

YOGA IN THE PREVENTION AND SELF MANAGEMENT OF THE CONDITIONS ASSOCIATED WITH OLD AGE: 2. SITTING DOWN POSES

Agarwal, Shashi

Agarwal Health Center, United States

Introduction: Yoga is practiced by millions all over the world. Having being practiced for more than 5000 years in India, its popularity in the West has steadily grown given its extensive health benefits. These include improved flexibility, strength, posture, mood, concentration, and relaxation. Medical benefits are seen in hypertension and other cardiovascular diseases, asthma, arthritis, insomnia, depression and many other health conditions. The Yoga Sutras (aphorisms) describe eight limbs of yoga practice: yama (moral behavior); niyama (healthy habits); asana (physical postures); pranayama (breathing exercises); pratyahara (sense withdrawal); dharana (concentration); dhyana (contemplation); and samadhi (higher consciousness). Commonly practiced yoga sutras in the western world include physical postures, breathing exercises and meditation. **Methods:** Several hundred yoga poses were reviewed from several yoga texts. Twenty simple postures with the most benefit and safety

for seniors were picked for this four-poster presentation. **Results:** The following five sitting postures should be done second in this four-sequence yoga session. These postures will be illustrated and their mode of performance and benefits described in the poster: 1. Butterfly or Bound Angle Pose (Baddha Konasana) 2. Staff Pose (Dandasana) 3. Seated Forward Bend Pose (Paschimottanasana) 4. Seated Twist Pose (Bharadvajasana) 5. Child's Pose (Balasana). **Conclusion:** Selected yoga postures can be regularly performed by the elderly. Yoga can be an excellent active method in the prevention and self-management of the conditions associated with ageing. It is simple to learn, easy to perform and is virtually free of any harmful effects. It has been associated with excellent adherence. Regular performance of these postures can be highly rewarding in the elderly. **Keywords:** Yoga; Self-Management; Breathing; Meditation; Sitting.

YOGA IN THE PREVENTION AND SELF MANAGEMENT OF THE CONDITIONS ASSOCIATED WITH OLD AGE: 3. LYING FACE DOWN POSES

Agarwal, Shashi

Agarwal Health Center, United States

Introduction: Yoga is practiced by millions all over the world. Having being practiced for more than 5000 years in India, its popularity in the West has steadily grown given its extensive health benefits. These include improved flexibility, strength, posture, mood, concentration, and relaxation. Medical benefits are seen in hypertension and other cardiovascular diseases, asthma, arthritis, insomnia, depression and many other health conditions. The Yoga Sutras (aphorisms) describe eight limbs of yoga practice: yama (moral behavior); niyama (healthy habits); asana (physical postures); pranayama (breathing exercises); pratyahara (sense withdrawal); dharana (concentration); dhyana (contemplation); and samadhi (higher consciousness). Commonly practiced yoga sutras in the western world include physical postures, breathing exercises and meditation. **Methods:** Several hundred yoga poses were reviewed from several yoga texts. Twenty simple postures with the most benefit and safety for seniors were picked for this four-poster presentation. **Results:** The following five lying face down poses should be done third in this four sequence yoga session. These postures will be illustrated and their mode of performance and benefits described in the poster: 1. Cobra Pose (Bhujangasana) 2. Plank Pose 3. Cat Pose (Marjaryasana) 4. Cow Pose (Bitilasana) 5. Downward facing Dog Pose (Adho Mukha Svanasana). **Conclusion:** Selected yoga postures can be regularly performed by the elderly. Yoga can be an excellent active method in the prevention and self-management of the conditions associated with ageing. It is simple to learn, easy to perform and is virtually free of any harmful effects. It has been associated with excellent adherence. Regular performance of these postures can be highly rewarding in the elderly. **Keywords:** Yoga; Self-Management; Breathing; Meditation; Lying Down.

YOGA IN THE PREVENTION AND SELF MANAGEMENT OF THE CONDITIONS ASSOCIATED WITH OLD AGE: 4. LYING FACE UP POSES

Agarwal, Shashi

Agarwal Health Center, United States

Introduction: Yoga is practiced by millions all over the world. Having being practiced for more than 5000 years in India, its popularity in the West has steadily grown given its extensive health benefits. These include improved flexibility, strength, posture, mood, concentration,

and relaxation. Medical benefits are seen in hypertension and other cardiovascular diseases, asthma, arthritis, insomnia, depression and many other health conditions. The Yoga Sutras (aphorisms) describe eight limbs of yoga practice: yama (moral behavior); niyama (healthy habits); asana (physical postures); pranayama (breathing exercises); pratyahara (sense withdrawal); dharana (concentration); dhyana (contemplation); and samadhi (higher consciousness). Commonly practiced yoga sutras in the western world include physical postures, breathing exercises and meditation. **Methods:** Several hundred yoga poses were reviewed from several yoga texts. Twenty simple postures with the most benefit and safety for seniors were picked for this four-poster presentation. **Results:** The following five lying face up poses should be done fourth in this four sequence yoga session. These postures will be illustrated and their mode of performance and benefits described in the poster: 1. Reclining Big Toe Pose (Supta Padangusthasana) 2. Baby Pose (Anand Balasana) 3. Lying Abdominal Twist Pose (Supta Udkarshansana) 4. Bridge Pose (Setu Bandha Sarvangasana) 5. Corpse pose (Savasana). **Conclusion:** Selected yoga postures can be regularly performed by the elderly. Yoga can be an excellent active method in the prevention and self-management of the conditions associated with ageing. It is simple to learn, easy to perform and is virtually free of any harmful effects. It has been associated with excellent adherence. Regular performance of these postures can be highly rewarding in the elderly. **Keywords:** Yoga; Self-Management; Breathing; Meditation; Lying Up.

IMPACT OF EXERCISE AND ISOFLAVONES ON BODY COMPOSITION AND METABOLIC PROFILE

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Benefits of exercise on postmenopausal women's health are well known. But the combination of exercise with isoflavones has been less explored, although few scientific articles have announced promising perspectives. For the last 5 y, two clinical trials addressing the potential benefits of exercise combined with isoflavones has been conducted at the University of Sherbrooke in Canada. This poster aim at presenting the results of several analyses derived from these trials. Four main categories were identified: body composition (DXA), muscle indexes (muscle strength and quality), cardio-metabolic and hepatic profile (fasting blood dosages), and quality of life (SF-36 questionnaire). According to the progress of the trials, sample sizes varied from 48 to 100 overweight-to-obese postmenopausal women (BMI 28-40 kg/m²). In all studies, the intervention consisted of a supplementation of soy isoflavones or placebo (70mg/d) combined with 6 to 12 mo of structured physical activity (EX+ISO or EX+PLA groups). We found that exercise combined with isoflavones reduced body weight ($p < 0.05$), total ($p < 0.05$) and trunk fat mass ($p = 0.04$) and increased appendicular ($p < 0.05$) and leg lean body mass ($p = 0.031$) after 6 mo of intervention, compared to exercise alone, but had no further effect on muscle strength and muscle quality. However, the isoflavones effect on body composition variables was no longer present at 12 mo. The addition of isoflavones to exercise brought favorable changes in GGT (hepatic enzyme) ($p < 0.01$), fatty liver index ($p < 0.01$), insulin resistance ($p = 0.02$) and serum triglycerides ($p < 0.05$). As for quality of life, the combination of isoflavones to exercise appeared to be a better strategy than exercise alone in order to improve several subscales of the SF-36 questionnaires ($0.001 < P < 0.04$). In conclusion, the addition of isoflavones to exercise seems to be an interesting way

of improving physical and psychological aspects of overweight-to-obese postmenopausal women's health. **Keywords:** Exercise; Isoflavones; Body Composition; Metabolic; Strength.

IMPACT OF EXERCISE AND ISOFLAVONES ON BODY COMPOSITION AND METABOLIC PROFILE

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Introduction: The benefits of exercise on postmenopausal women's health are well known and its combination with isoflavones – estrogenic compounds derived from plants – has recently been explored, with a few scientific articles announcing promising perspectives. During the last 5 y, two clinical trials addressing the potential benefits of exercise combined with isoflavones has been conducted at the University of Sherbrooke, Québec, Canada. **Objective:** This research work aims at presenting the overview of several analyses derived from these trials. **Methods:** Three main categories of variables were reported: body composition (DXA), cardio-metabolic and hepatic profile (fasting blood dosages), and quality of life (SF-36 questionnaire). Based on the progress of the trials, sample sizes varied from 48 to 100 overweight-to-obese postmenopausal women (BMI 28-40 kg/m²). In all studies, the intervention consisted of a supplementation of soy isoflavones or placebo (70mg/d) combined with 6 to 12 mo of structured physical activity (EX+ISO or EX+PLA groups). **Results:** We found that exercise combined with isoflavones, compared to exercise alone, reduced body weight ($p < 0.05$), total ($p < 0.05$) and trunk fat mass ($p = 0.04$) and increased appendicular ($p < 0.05$) and leg lean body mass ($p = 0.031$) after 6 mo of intervention, but had no further effect at 12 mo. The addition of isoflavones to exercise also brought favorable changes in GGT (hepatic enzyme) ($p < 0.01$), fatty liver index ($p < 0.01$), insulin resistance ($p = 0.02$), serum triglycerides ($p < 0.05$), and several subscales of the SF-36 questionnaires ($0.001 < p < 0.04$). **Conclusion:** The addition of isoflavones to exercise seems to be an interesting way of improving physical and psychological health in overweight-to-obese postmenopausal women. Altogether, these data emphasize the need to convey further investigations in order to better understand the synergetic effect of isoflavones and exercise. **Keywords:** Exercise; Isoflavones; Body Composition; Metabolic; Quality of Life.

DIFFERENCES OF VO₂ IN THE EQUATION ROCKPORT ONE MILE TEST BETWEEN MEAN VS. MAXIMUM HEART RATE

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VO₂ is a physiological variable that decreases progressively with age. An exercise prescription should include aerobic, muscle-strengthening, and flexibility exercises (ACSM, 2009). However, Rockport one-mile walk test protocol provides a valid sub-maximal assessment to estimate VO_{2max} (Kline, 1987). Researchers often use in the generalized equation the maximum heart rate (HR) in the final test, but the mean HR is rarely used in papers. **Purpose:** The aim of this study was to analyze the differences in the equation to determine VO₂ of Rockport test (Kline, 1987) between maximum HR (frequently used) and mean HR in +55-year-old people. **Methods:** 24 participants (12 males and 12 females) agreed to participate in this study (64.23 ± 4.81 yrs; 68.6 ± 11.43 kg; 161.0 ± 7.11 cm). HR was

registered by means of 1Hz GPS devices (SPI10 and WiSPI, GPSports, Australia). **Results:** VO_2 calculated with mean HR was higher (38.27 ± 7.92 ml/kg/min) than with maximal HR (34.28 ± 8.78 ml/kg/min; $p < 0.001$) in the generalized equation. According to Kline (1987), the first data obtained (with mean HR) belong to very goods in the fitness classification according to age. The second data obtained (with maximum HR) belong to a good in the same classification. **Conclusion:** The main finding was that the variation of HR in Rockport test affects the VO_2 , improving the assessment of the test since more precise values are given. **Keywords:** Cardiovascular; Rockport Test; Heart Rate; Oxygen.

INFLUENCE OF SEX AND OVERWEIGHT USING SOME INTEGRATION PATTERNS OF HEART RATE AND SPEED TO ESTIMATE $\text{VO}_{2\text{PEAK}}$ FROM ONE MILE TEST?

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Cardiorespiratory fitness ($\text{VO}_{2\text{peak}}$) is one important variable associate with health and mortality on elderly. The Rockport test has been traditionally used to estimate $\text{VO}_{2\text{peak}}$. However, there is not enough knowledge about its validity for aging people. One important limitation should be related with the integration pattern for heart rate (HR) and speed values (maximum final or mean values) that are included in the equation. Also, gender and obesity would be variables, which can modify the final estimation. **Purpose:** To explore the differences between estimated $\text{VO}_{2\text{peak}}$ from maximum and mean variables (HR and speed); also, to analyze the effect of gender and overweight. **Method:** Forty participants (16 males and 24 females) were selected for this study (64.2 ± 4.5 yrs; 69.3 ± 11.0 kg; 161.6 ± 7.4 cm). Body mass index (BMI) was used to classify overweight. All subjects performed the one-mile Rockport test; HR and speed were recorded with GPS device. $\text{VO}_{2\text{peak}}$ was estimated using the traditional Rockport equation; two $\text{VO}_{2\text{peak}}$ were estimated: $\text{VO}_{2\text{peakM}}$, using maximum values of HR and speed; $\text{VO}_{2\text{peakA}}$, using mean values. Repeated measures test were carried out to compare variables between gender and BMI groups. **Results:** Men were faster than women either mean (6.67 ± 0.26 vs. 5.78 ± 0.37 km/h, $p < 0.05$) or maximum speed (7.74 ± 0.47 vs. 6.79 ± 0.98 km/h; $p < 0.05$). Men showed the highest mean (132 ± 14 vs. 115 ± 20 beats/min) and maximum (152 ± 16 vs. 132 ± 23 beats/min) HRs values. Between-groups effect was found on comparisons $\text{VO}_{2\text{peak}}$ for gender (males: 42.2 ± 4.3 and 35.2 ± 4.8 vs. females: 36.4 ± 8.4 and 27.2 ± 10.3 ml/kg/min; for $\text{VO}_{2\text{peakM}}$ and $\text{VO}_{2\text{peakA}}$, respectively). **Conclusion:** Our data showed significant differences between estimated $\text{VO}_{2\text{peak}}$, using different patterns of data integration, which should be a consequence of a non-steady-state pace during the test. These results may trade with the test validity, however more research must be necessary to clarify the physiological implications. **Keywords:** Sex; Overweight; Cardiovascular; Rockport Test.

PHYSICAL ACTIVITY AND ASSOCIATED VARIABLES IN THE OLDEST OLD

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In this cross-sectional epidemiological and household-based study we examined factors associated with physical activity level in all rural residents aged 80 + years in Antônio Carlos, Santa Catarina State, Brazil. A questionnaire was utilized and included information

on sociodemographic variables, health and lifestyle, and also body mass index. We used the Chi-square or Fisher's exact one-sided, with $p \leq .05$. The mean age of participants was 84.3 ± 4.46 years and 57.3% ($n = 71$) were female. More than half (54.8%) performed less than 150 min per week of moderate activity, and the mean sitting time per day was 5.23 ± 2.11 hours. The oldest old who did not meet the recommendations of physical activity to health had a higher prevalence of cognitive impairment ($p = .04$), negative perception of health ($p = .03$), and spent more time sitting ($p = .03$). The relationship between low physical activity levels with poorer health perception and cognitive decline reinforces the importance of encouraging regular physical activity in the oldest old population, accompanied with adequate food, aiming for a healthier aging. **Keywords:** Physical Activity; Rural; Socio-Demographics; Lifestyle; Body Mass Index.

SEDENTARY BEHAVIOR AND SELF-PERCEIVED HEALTH IN BRAZILIAN COMMUNITY-DWELLING ELDERLY

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The aim of this study was verify the association between sedentary behavior and self-perception health in community-dwelling elderly. Cross-sectional and household-based health survey with 477 elderly (60+ years), selected by simple random sample, in Antonio Carlos, southern Brazil (2011). Sedentary behavior was evaluated using one question of the International Physical Activity Questionnaire (median of the self-reported sitting time): <5 hours/day and ≥ 5 hours/day. Chi square test or Fisher exact test analyses were used to examine for associations between the sedentary behavior and self-perceived health: positive (excellent, very good, good) and negative (fair or poor). Two hundred sixty-two women (73.0 ± 8.6 y) and 196 men (73.3 ± 9.0 y) were examined. Positive self-perceived health was exceptional (96.9%, women and 92.3%, men). The percentages of elderly participants who self-reported prolonged sitting times (sedentary behavior) were 52.3% for women and 53.6% for men. A positive self-perceived health was observed in more than 90.0% of elderly who reported shorter or longer sitting times. There was no significant difference between the sedentary behavior and self-perceived health. **Keywords:** Sedentary; Perception; Health; Brazilian.

BARRIERS TO PHYSICAL ACTIVITY IN RURAL, COMMUNITY-DWELLING ELDERLY

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The aim of this study was to identify barriers to physical activity in rural, community-dwelling elderly. This study is part of a wider project researching the effectiveness of actions of physical activity and nutrition among the elderly of Antônio Carlos, Santa Catarina State, Brazil. Semi-structured interviews were carried out with 36 individuals (7 men e 29 women) aged between 69 and 91 years old, selected (saturation sampling) from a random sample of 477 elderly members of the community. The interview script was prepared during preliminary epidemiology research. The interviews (August 2011), carried out in the municipality community centre, were recorded, and the transcripts analysed using the technique of content analysis. The main restraints reported were physical barriers and/or health problems, and the most common were: high blood pressure, diabetes, labyrinthitis, spinal problems (among the women) and heart problems. Fatigue and lack of motivation were also reported by the majority of the elderly as barriers for the practise of regular physical activity. The

lack of a partner or a group to perform physical activities with was mentioned, but only by a few interviewees. The research reveals the need to invest in spreading information about the benefits of practising physical activity within this community, as well as the need to provide effective options for these individuals to practise physical activities. Promotion and intervention strategies should consider the barriers to the specific needs of older adults. **Keywords:** Barriers; Physical Activity; Rural; Municipality.

CONTRIBUTING FACTORS TO BASIC MOBILITY IN OLDER ADULTS WITH DIABETES MELLITUS

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Background: Diabetes mellitus (DM) is a major health concern, especially for the elderly. In addition to the common complications, older adults with DM are also likely to have balance impairments that could lead to mobility problems. The purpose of this study was to identify factors contributing to basic mobility in older adults with DM. **Methods:** Sixty-six community-dwelling older adults with DM participated in the study. The basic mobility tasks were 6-meter walk and 5 sit-to-stand tests. Three categories of factors were assessed. Non-modifiable factors included age and gender. Physiological factors included body mass index, visual contrast sensitivity, hand and foot reaction time, knee flexors and extensors strength and proprioception, and single leg stance time. Behavioral factors included living arrangement, use of walking aid, and number of medications, activity level, and nutrition. Blocked stepwise regression analysis forced entering the non-modifiable factors, then entering the physiological and behavioral blocks sequentially was conducted for the two mobility tasks separately. **Results:** For the 6 meter walk test, the mean was 6.52 s (± 0.48), and age, gender, visual sensitivity, hand and foot reaction time, and walking aid were found to be significant predictors ($R^2 = 47.6\%$). For the 5 sit-to-stand test, the mean was 14.22 s (± 0.35), and age, gender, single leg stance, foot reaction time, and use of walking aid were found to be significant predictors ($R^2 = 39.9\%$). **Discussion and Conclusion:** Walking and standing up from a seated position are essential abilities required for activities of daily living and were found to have declined in older adults with DM, compared to normal performance reported in the literature. There were some common as well as specific contributing factors to these two tasks that should be taken into consideration in the management of walking or sit-to-stand impairments in this population. **Keywords:** Diabetes; Mobility; Walking; Standing.

THE HEALTH ASSESSMENT OF ELDERLY PEOPLE AND ITS RELATED FACTORS

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Introduction: Success in family planning, development of primary health care, increase social and economic status and use of new technology was resulted to increasing older people in world. Health assessment includes functional ability, physical, mental and cognitive health and nutritional status has been consisted by American and British Geriatricians, This early assessment, screen and diagnosis will result in decreasing cost in health care, mortality rate and increasing cognitive and affect skills and functional autonomy. **Aim:** To determine of general health, nutrition, cognition, equilibrium and activity of daily living in

older people. **Method:** This is a descriptive-cross sectional study, 194 elderly people were assessed by questionnaire include demographic characters, General health questionnaire, Mini nutritional assessment (MNA), Mini mental status examination (MMSE), Tinetti test, Kats & Lawton. Data analysis was done by descriptive and inferential statistics (spearman, Kruskal-Wallis) by using SPSS (16). **Result:** Results showed that 17.5% of participants had relative suitable general health, 4% malnutrition, 0.8% moderate mental disorder, 18% abnormal static equilibrium, 4.6% abnormal dynamic equilibrium, and 3.1% had completely dependent in activity of daily living. General health with marital status ($p < 0/01$), education ($0/048$), Nutritional status with sex ($p < 0/02$), marital status ($p < 0/02$) and income status ($p < 0/013$). Cognitive status with age ($p < 0.03$), sex, marital status ($p < 0.002$) and education ($p < 0.0001$), Equilibrium with age ($p < 0/0001$) and morbidity ($p < 0/016$), Activity of daily living with age ($p < 0/00001$), sex ($p < 0/011$), marital status ($p < 0/0001$), education ($p < 0/0001$). Income status ($p < 0/0001$) and morbidity ($p < 0/005$) had a significant correlation. **Conclusion:** The study showed that assessment of older people by health care professionals can help in detecting the high-risk patients and promote their caring. **Keywords:** Elderly; Health; Cognition; Activity.

SIGNIFICANCE OF SPORT PRACTICE OF VOLLEYBALL FOR BRAZILIAN OLDER PEOPLE: ADHERENCE AND PERMANENCE

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This study aimed to analyze the significance of sport practice of volleyball for Brazilian older people, Florianópolis, Santa Catarina State, Brazil. The study included 11 older people (eight women; $= 69,5 \pm 4,8$ years) practitioners of volleyball in the extension program of Federal University of Santa Catarina. The data were collected through semi-structured interview and questionnaire (adherence and permanence aspects), performed by content analysis. The meaning of volleyball is related to socialization, mood and well-being, health. Liking sport, invitation of friends or spouse, socialization, health, occupation of free time and medical indication was cited for adherence of sport practice of volleyball. The permanence motives the most related were liking sport, socialization, health and well-being. It was concluded that the categories analyzed for significance, adherence and permanence of volleyball practice showed interrelated to perception of physical, psychological and social benefits. Therefore, it's expected that the results may contribute opportune reflection on the possibilities of the sport practice of volleyball for older people, encouraging effective participation in this population. **Keywords:** Sport; Volleyball; Adherence; Permanence; Brazilian.

EFFECTS OF AN INTEGRATED PROGRAM OF PHYSICAL ACTIVITY IN A POPULATION OF WOMEN OVER 60 YEARS

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Introduction: Arguably, there are two criteria are met in the aging process: 1) the probability of dying increases with age of the organism; 2) that the phenotype of every individual undergoes changes over time. Therefore, as part of the aging process, most physiological functions and physical lose efficiency (Chodzko-Zajko, W et al; 2009. Our goal is to work

through a new integrated system that allows globally affect the physical, psychological and sociological with the aging process are affected. **Methods:** The sample comprises a population of 18 women with a mean age of 72.28 years (± 3.39), an average height of 155.37 cm (± 6.19) and a weight of 71.12 kilos (± 11.59). To perform the study used the health questionnaire SF-12 in the version 2 (Alonso, J et al;1995), the Senior Fitness Test (Rikli R et al; 1999) and a satisfaction scale. Also applied 27 sessions of cooperative type and form of games, twice per week with a duration of 1 hour per session. **Results:** As for the perceptual assessment of health, there are statistically significant improvements in general health ($t = -2.474$, $P = 0.024$), and a tendency to improve the vitality ($t = -1.831$, $P = 0.085$). With regard to fitness, there are significant differences in push-ups ($t = -3.033$, $p = 0.008$) and 6-min walk ($t = -2.470$, $p = 0.024$) between pre and posttest. In terms of satisfaction with the session, the majority (83.3%) considered a good organization of the sessions, as they consider fun sessions (100%) and useful (94.4%) or adapted to their opportunities (94.4%) while interesting (100%). Also consider that the sessions have improved their physical condition (72.2%) and found it to their practice (88.9%). **Conclusion:** Our research indicates that contributed to a seamless session of fitness, coordination, memory and improvements on the physical, were achieved improvements in perceived health in old adults. This type of intervention invite as a means of socializing and welfare. **Keywords:** Physical Activity; Psychological; Sociological; Satisfaction.

WEIGHT GAINED SINCE MENOPAUSE AND ADHERENCE TO SUPERVISED TRAINING TRIALS IN OVERWEIGHT POSTMENOPAUSAL WOMEN

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Adherence to physical activity interventions is instrumental for its success in health prevention. However, the determinants of adherence to exercise trials in postmenopausal women remain poorly understood. Factors such as socioeconomic status, exercise history, and body composition variables have been associated to dropout rates but results remain inconclusive. **Objective:** The purpose of this study was to investigate characteristics differentiating dropouts from completers in sedentary overweight postmenopausal women, potentially explaining why an important proportion did not complete our trial. **Methods:** A 12-month supervised exercise training study was conducted in our laboratory with sedentary, overweight, postmenopausal women (age: 60.1 ± 4.9 yrs; body mass index: $29.2 \pm 3.5 \text{ kg/m}^2$). After the experiment, we compared completers ($n = 31$) to dropouts ($n = 24$) regarding several body composition (weight, body mass index, total fat mass, weight gained since menopause), metabolic (fasting glucose level, aerobic capacity, blood pressure, cholesterol level) socioeconomic (age, education level, marital status) and behavioural (physical activity level before and since menopause, tobacco and alcohol consumption) characteristics. Dropouts were defined as subjects not having completed the 12 month-exercise program and the last testing session. **Results:** Among the selected variables, weight gained since menopause was the only factor distinguishing dropouts from completers, as dropouts presented a significantly higher weight gain since menopause ($p < 0.05$) than their counterparts who completed the study. **Conclusions:** This study suggests that, despite similar body composition, metabolic and socioeconomic profiles, sedentary women who gained more weight since menopause might be less adherent to exercise trials and ultimately, more resistant to lifestyle changes. This outcome brings promising avenues of investigation to help clarify the issues of adherence in sedentary aging women. **Keywords:** Menopause; Adherence; Overweight; Sedentary.

IMPACT OF THE SOCIAL EDUCATOR ACADEMIC SKILLS IN THE ACTIVE AGEING PROMOTION

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The Social Educator Workers aim to empower people and social groups with relevant resources. Its academic preparation should be based on the Active Ageing paradigm (WHO, 2002), in order to contribute actively in health promotion and in the improvement of new opportunities of participation and citizenship through a socio-educational intervention. Explore the impact of the Academic skills developed in the Social Education Degree of Education School Polytechnical Institute of Viseu on the active ageing promotion. The design was an exploratory study, using a survey with open and close answers applied to the different subjects engaged on the Social Education degree's Practice. The sample included social education interns (n = 29), practice supervisor (n = 12) and elderly participants (n = 110) (the mode age is on the range of 74-85 years old). The Practice included several activities in institutional and community context. Physical activity was selected as the favourite for most of the participants (90%). The results impact for the developed activities, on target population, show personal, socio-educative and community benefits, being the personal dimension the mainly reported for the practice supervisor (46.2%) and for the education interns (79.7%). The most valorized personal dimension subcategories for both groups were the "interpersonal relationships" and the "increase of occupational dynamics." The developed activities were very positive evaluated by the elderly group (like very much = 100%). 90% of the inquired sample referred to "be more happy" and 85% "learn new things." Through the professional practice the Social Education Degree Academic Skills reveals a positive effect in active ageing promotion of the target population. The Practice is evaluated by the three groups (interns, practice supervisor and elderly participants) as important for the personal, socio-education and community development. **Keywords:** Social; Education; Active Ageing; Skills; Promotion.

COLLABORATIVE PATIENT CARE PATHWAY MODEL: AN EVIDENCE BASED PATIENT-CENTERED COORDINATED CARE MODEL FOR GERIATRIC POPULATION

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Model Current trends in healthcare reform in the United States include penalties for high readmission rates that put providers at risk if patients are rehospitalized within 30 days. The goal of recent incentives under healthcare reform is to promote increased attention to chronic disease self-management competencies of patients, alter healthcare delivery systems to have increased responsibility for preventable readmissions and enhance quality care while using resources wisely. Kissito Healthcare has designed a unique collaborative model, the Collaborative Patient Care Pathway (CPCP) Model which aims to deliver quality patient-centered care, greater continuity of care and improved patient outcomes at a reduced cost. The Model primarily focuses on chronic illnesses such as Congestive Heart Failure, Pneumonia, Acute Myocardial Infarction, Diabetes, Orthopedic Conditions, Depression and COPD/ Asthma and patient's self-management skills. The CPCP Model is based on four tenets such as process, quality, cost and outcome with the patient considered as the centre for the tenets and four domains such as Disease Awareness, Adherence Attitudes, Treatment and Medication

Management Competence and Healthcare Communication. Evidence-based best practices are embedded in the care processes. Care is coordinated and integrated across all elements and in a culturally and linguistically appropriate manner. The CPCP model is in its early implementation stage but preliminary results demonstrate reduction in hospital readmissions within 30 days of post-acute-care discharge and successful transition to home among geriatric patients. The components of the Model are constantly being refined to establish best practices, benchmarks, databanks, and setting standards to ensure that national standards are met and exceeded. The goal is to improve patient outcomes at a reduced cost through the CPCPTM Model that can be widely implemented and ultimately translated into a national standard.

Keywords: Evidence-based; Patient-centered; Care; Cost; Chronic Illnesses.

INFLUENCE OF HEAT STRESS ON JOGGING PERFORMANCE

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Introduction: It is known that heat stress, common with high temperature and humidity, degrades human activities, and sometimes leads to death, especially for the elderly. Several responses to heat stroke have been adopted, especially in summer. This paper clarifies how changes in temperature and humidity influence the jogging performance of a middle age jogger. **Methods:** A healthy male, 56 y, jogged at about 70% strength for 7 km on a flat road in the daytime over an entire year. Temperature (T) (3.8 – 33.5 degree C) and humidity (H) adjacent to the road, heart rate (HR), and average speed were measured. In order to accurately assess the environment, estimated WBGT (Wet Bulb Globe Temperature) was used in conjunction with T and H as measured at the Seikei Meteorological Observatory for comparison. The HR and time were recorded by a wearable sensor (SEIKO PulseGraph). Only the data captured at the same place were used for comparison (N = 61). Average speed (second/km) and average HR were compared in terms of the WBGT zone (5 degree steps from 5.0 to 35.0 degree C; 6 zones in total). **Results:** The results show that average speed was almost constant if WBGT < 25 degree C. It decreased at the rate of about 5% / 5 degree C over 25 degrees C (p < 0.05). Average HR somewhat decreased over 30 degree C. This comes from the increase of strength by the change of environment resulted in the decrease of the jogging speed. **Conclusion:** Our experiment in an actual environment with high temperature and humidity clarified how heat stress influences jogging performance. WBGT might be better for judging the environmental condition than temperature only, especially when the humidity is high. Careful attention is necessary for those exercising if WBGT > 25.0, especially the elderly. **Keywords:** Heat Stress; Jogging; Temperature; Humidity.

SENIOR CITIZENS RISK IN HOUSING PROVIDED BY THE STATE OF CHILE, EVALUATION FOR IMPROVEMENT THROUGH ARCHITECTURE AND DESIGN

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One of the less attended aspects related to the increasing aging population in Chile deals with the built environment is. By 2050, it is expected that 1 out of 4 inhabitants of our country will be over sixty, which will require an adequate environment minimizing risks situations helping to extend autonomy of this age group. We present an ongoing research related to the identification of risk situations in housing solutions for senior citizens offered

by the government of Chile, in order to develop guidelines which can serve as a base for improvement through architecture and design. Methodologically we have designed an instrument from an ergonomic perspective, which allows us to evaluate risk conditions in the development of basic day life activities in cases studies selected for each typology. Our observation takes in consideration objective, subjective and reference opinions in relation to the problem. From an objective point of view, we consider observation by the professionals participating in this research, architects and Industrial designers; as a subjective input, we consider the opinions of users in space; finally, we consider reference scales through bibliography. Findings consider environmental issues such as security related to the need of protection and definition of territory or healthy environmental conditions required in the interior of units involving heating and ventilation or risk of accidents, which involve inadequate design. **Keywords:** Architecture; Housing; Ergonomic; Risk; Environmental.

IBUPROFEN IMMEDIATELY FOLLOWING RESISTANCE EXERCISE HAS NO BENEFICIAL EFFECT ON MUSCLE MASS AND STRENGTH IN POSTMENOPAUSAL WOMEN

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Postmenopausal women typically experience accelerated muscle loss which has a negative effect on strength. One contributing factor for age-related muscle atrophy is inflammation. The use of non-steroidal anti-inflammatory drugs (NSAIDs) such as ibuprofen may attenuate the inflammatory response from resistance exercise leading to accelerated muscle recovery and muscle hypertrophy over time. This study aimed to determine the effects of ibuprofen (400 mg) immediately following resistance exercise (RE) sessions on muscle mass, strength and muscle soreness in postmenopausal women. Participants were randomized to ingest ibuprofen (IBU; $n = 15$, 57.8 ± 5.1 yrs, 75.9 ± 9.0 kg, 165.9 ± 6.2 cm) or placebo (PLA; $n = 13$, 56.5 ± 4.4 yrs, 73.0 ± 10.4 kg, 163.1 ± 5.9 cm) immediately following RE (11 whole-body exercises) which was performed 3 days per week, on non-consecutive days, for 9 weeks. Prior to and following training, measures were taken for lean tissue mass (dual energy x-ray absorptiometry), muscle size of the elbow and knee flexors and extensors and ankle dorsi flexors and plantar flexors (ultrasound), and strength (1-repetition maximum leg press and chest press). In addition, participants rated their muscle soreness prior to each training session. Over the 9 weeks of training, there were significant changes ($p < 0.05$) in lean tissue mass (IBU: -1.1 ± 1.0 kg, PLA: -0.7 ± 1.4 kg), muscle size of the knee extensors (IBU: 0.3 ± 0.6 cm, PLA: 0.2 ± 0.7 cm), ankle dorsi flexors (IBU: 0.5 ± 0.8 cm, PLA: 0.1 ± 0.5 cm), ankle plantar flexors (IBU: 0.3 ± 0.9 cm, PLA: 0.5 ± 0.9 cm), leg press strength (IBU: 20.6 ± 18.0 kg, PLA: 20.0 ± 20.0 kg) and chest press strength (IBU: 5.1 ± 9.5 kg, PLA: 8.1 ± 7.6 kg) with no differences between groups. Muscle soreness did not change in either group over time. Ibuprofen consumed only on resistance-exercise training days has no effect on muscle mass or strength in postmenopausal women. **Keywords:** Ibuprofen; Resistance Training; Menopause; Muscle Mass; Strength.

CROSS-CULTURAL ADAPTATION OF ASKAS (AGING SEXUAL KNOWLEDGE AND ATTITUDES) SCALE IN BRAZILIAN ELDERLY PEOPLE

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Objective: The proposal of this study was to do a cultural adaptation of ASKAS - Aging Sexual Knowledge and Attitudes Scale to be used in Brazil. **Methods:** The cultural adaptation was accomplished according to the Academy of Orthopaedic Surgeons' Recommendations for Cultural Adaptation of Health Condition Measures. The sample was composed by 802 individual from public and private educational programs for elderly people. To assess the reliability of the measurement, the Cronbach's alpha coefficient was computed and confirmatory factorial analysis model (linear structural equation model) was used to evaluate the construct validity. **Results:** The validity of the scale content was obtained through its analysis by the experts committee who elaborated a pre-final version to be used in the pre-test. On the adjustment of the model, were eliminated the factors which presented a low factorial charge in their construct. **Conclusions:** The Brazilian version of ASKAS has a new layout and 28 questions instead 61 of original scale. This scale showed good reliability and internally consistent presenting Alpha's Cronbach values similar to original version. We expect this research to contribute to future studies about sexuality in the aging process, broadening the knowledge produced in Brazil on that thematic.

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