

Welcome to Active Inform; a bimonthly research based physical activity newsletter targeting practitioners in the field. Active Inform aims to increase access to the evidence base for physical activity promotion. It will provide a snapshot of the latest physical activity research news, key documents, models and other tools to assist you to promote physical activity.

Feedback about this and future issues of Active Inform is welcome via email to twhalen@kinectaustralia.org.au.

Osteoporosis, Falls Risk and Physical Activity

Osteoporosis Australia defines *osteoporosis* as “a condition in which the bones become fragile and brittle, leading to a higher risk of fractures (breaks or cracks) than normal bone. Osteoporosis occurs when bones lose minerals such as calcium, and the body cannot replace these minerals fast enough to keep the bones healthy. As a result, bones become thinner and less dense.”¹ According to the Australian Institute of Health and Welfare (AIHW), approximately 300,000 (1.6%) of Australians reported having osteoporosis in the 2001 National Health Survey. However, they explain, this data is based on self-reports and is likely to underestimate the actual prevalence. Osteoporosis is often not diagnosed until a fracture (a consequence of osteoporosis) occurs. Access Economics research estimates the prevalence of osteoporosis by including proportions of those reporting (as a result of a fracture) back problems, curvature of the spine, other musculoskeletal diseases, as well as fractures from injuries, and osteoporosis from secondary sources. This method produces an estimate of 1.8 million people with osteoporosis in 1995.² Osteoporosis Australia¹ reports:

- Every 8 minutes, someone is admitted to an Australian hospital with an osteoporotic fracture. This is expected to rise to every 3-4 minutes by the year 2021.
- In 2002, 1.9 million people in Australia had osteoporosis. This number is expected to rise to 2.2 million by the year 2006 and to 3 million by the year 2021.
- As many as 4 out of 5 people with osteoporosis don't know that they have it although they are at risk of fracturing a bone. More than 3 out of 4 people with known osteoporotic fractures are not treated to prevent further bone loss and stop the fracture cascade.
- Osteoporosis affects much more women than men. One in two women and one in three men over the age of 60 will have a fracture due to osteoporosis.

1. <http://www.osteoporosis.org.au/html/aboutosteomain.php>

2. http://www.aihw.gov.au/cdarf/data_pages/incidence_prevalence/index.cfm#Osteoporosis



There are numerous factors that increase the risk of osteoporosis. These include: age, gender, genetics, poor vitamin D and calcium status, low body weight, alcohol abuse and smoking, other medical conditions (such as hyperparathyroidism) and low levels of physical activity. The AIHW's Musculoskeletal Conditions report states: "Physical activity is a determinant of peak bone mass. Appropriate physical activity can slow bone mineral loss, help maintain posture and improve overall fitness. Choosing the right exercises and performing them correctly can help treat and prevent osteoporosis. Weight-bearing physical activity, in particular, is important for maintaining bone mass."

Several studies have assessed the role of physical activity in maintaining or improving bone mineral density and/or reducing falls and falls injuries. While there have been some mixed results, the evidence strongly points to the value of physical activity. One large study of the risk factors of hip fractures is the Mediterranean Osteoporosis Study⁴. In this study, researchers interviewed both cases and controls to determine international common risk factors. For females, late menarche, poor mental score, low BMI and physical activity, low exposure to sunlight, and a low consumption of calcium and tea remained independent risk factors after multivariate analysis, accounting for 70% of hip fractures. The authors concluded: "variations in lifestyle factors are associated with significant differences in the risk of hip fracture, account for a large component of the total risk, and may be of some value in selecting individuals at high risk." For men⁵, of the potentially 'reversible' risk factors, BMI, leisure exercise, exposure to sunlight and consumption of tea and alcohol and tobacco remained independent risk factors after multivariate analysis, accounting for 54% of hip fractures. Of the remaining factors low exposure to sunlight and decreased physical activity accounted for the highest attributable risks (14% and 9% respectively). Similar analyses of Spanish and Turkish women found similar results, with low physical activity being one of the biggest risk factors. An earlier study⁷ looked at cases and controls in Canada, specifically assessing past and recent physical activity, calculated as a compilation of activity scores at ages 16, 30, and 50 years. Recent activity was defined as activity in the past year for controls and activity in the year before fracture for cases. "This study showed evidence of independent protective effects of past physical activity and of moderate levels of recent physical activity on the risk of hip fracture in postmenopausal women."

More recently, a very large prospective study was conducted in the U.S. to assess the relationship of walking, leisure-time activity, and risk of hip fracture among postmenopausal women⁸. This study followed 61,200 women for 12 years. Active women with at least 24 MET (metabolic equivalent)-h/wk had a 55% lower risk of hip fracture compared with sedentary women with less than 3 MET-h/wk. Risk of hip fracture decreased linearly with increasing level of activity among women not taking postmenopausal hormones, but not among women taking hormones. Importantly, women who did no other exercise, walking for at least 4 h/wk was associated with a 41% lower risk of hip fracture compared with less than 1 h/wk. More time spent standing was also independently associated with lower risks. In addition to general physical activity, walking and strength training, Tai Chi has been gaining evidence as an effective intervention for reducing falls.

One strategy proven effective through recent research is the establishment of community coalitions to create safe, effective exercise classes for older adults to impact on falls risk and decrease risk of osteoporosis. The Active Aging Community Task Force (California) established, funded and supported 25 community coalitions to this end. Coalitions organised and conducted exercise class instructor trainings, lead local agencies in conducting classes, worked in advocacy roles, and created partnerships for providing opportunities throughout the community. Over 5 years over 7000 older adults participated in classes as a result. After 12- 24 weeks of exercise class participation, consistent gains were achieved in a range of strength and balance measures. Importantly, no adverse effects were reported for any class participant.⁹

Researchers, physicians, governments, have recommended physical activity as an effective, valuable tool. Numerous broad public health initiatives and local strategies have been successful in improving or maintaining bone mass and/or reducing falls and falls related injuries through physical activity. For example, The National Falls Prevention for Older People Initiative, run by the Australian Government's Department of Health and Ageing, aims to reduce the incidence, morbidity and mortality associated with falls in people aged 65 years and over (55+ Indigenous) living in community and aged care homes, as well as those being treated in hospitals. This initiative was established by the Australian Government in 1999-00 with funding of over \$8.9 million. The 2004-05 Federal Budget committed a further \$9.6 million to 2008. The Initiative involves multiple strategies, including workforce training, research and data collection, community physical activity interventions (including multi-cultural and rural projects). The Office of Senior Victorians provides grants to Primary Care Partnerships to implement projects which support older adults' participation in active living, called "Active Living Grants." Twenty nine projects have been funded.

Aims are:

- Increasing the number or range of programs available in the community such as strength training, walking, tai chi, chair-based exercise, cycling, group sport and recreation and introductory/transition physical activity programs
- Training of activity leaders to run classes targeting older adults
- Address barriers to participation and improving older adults access to active living programs
- Build networks which involve older people and enhance links between the health, sport and recreation and community sectors
- Improve referral and support for older people to participate in active living programs, especially those with a physical activity focus
- Advocate for supportive environments that promote active living by older persons.

Falls prevention, like any other intervention requires a strong community participatory approach in order to be effective and acceptable. A recent research paper analysed the view of 66 older people ages 61-94 in regard to falls prevention¹⁰. The thematic analysis illustrated strong feelings of negativity. Participants considered falls prevention to mean removal of hazards and restriction of activity; it was seen to be condescending, distressing and a potential threat to independence and sense of self. All the more reason, as the authors suggested, to focus messages on positive approaches like improving strength, balance, endurance and independence in activities of daily living through physical activity.

3. Australian Institute of Health and Welfare 2005. Arthritis and musculoskeletal conditions in Australia, 2005. AIHW Cat. No. PHE67. Canberra: AIHW.

4. Johnell, et al. Risk factors for hip fracture in European women: the MEDOS Study. *Mediterranean Osteoporosis Study. Journal of Bone Mineral Research.* Nov;10 (11):1802-15. 1995.

5. Kanis et al. Risk factors for hip fracture in men from southern Europe: the MEDOS study. *Mediterranean Osteoporosis Study. Osteoporosis International.* 9(1):45-54. 1999.

6. Perea, Galin, Dilsan. Risk factors for hip fracture in Spanish and Turkish women. *Bone.* 14 Suppl 1:S69-72. 1993.

7. Jaglal, Kreiger, Darlington, Past and recent physical activity and risk of hip fracture. *American Journal of Epidemiology.* Jul 15;138(2):107-18. 1993.

8. Feskanich et al. Walking and leisure-time activity and risk of hip fracture in postmenopausal women. *JAMA.* Nov 13;288(18):2300-6. 2002.

9. Steven P. Hooker and Lisa A. Cirill. Evaluation of community coalitions ability to create safe, effective exercise classes for older adults. *Evaluation and Program Planning* (29): 242-250. 2006.

10. Yardley, et al. Older people's views of advice about falls prevention: a qualitative study. *Health Education Research,* 21(4):508-517. 2006.

Resources

The National Falls Prevention for Older People Initiative Website

Visit the website for resources such as project descriptions, published reports, and related links.

Don't fall for it. Falls can be prevented!

Aimed at consumers, this booklet was developed by Stay On Your Feet - Adelaide West and National Ageing Research Institute, for the Australian Government Department of Health and Ageing, in 2004.

The booklet is aimed at community dwelling older people and their families and carers. It contains information about three aspects of falls prevention:

- **Fall-proofing yourself** - This section describes intrinsic falls risk factors, relating to a person and their health and describes in detail how these risk factors can be reduced.
- **Fall-proofing your surroundings** - This section describes extrinsic falls risk factors, relating to the environment and describes in detail how these risk factors can be reduced.
- **Just in case** - This section describes what to do in the event of a fall. Information in this section includes how to minimise injury from a fall, making a plan to get help if you fall and how to get yourself and others up from the floor in the event of a fall.

Download or order the booklet

<http://www.health.gov.au/internet/wcms/publishing.nsf/Content/phd-pub-injury-dontfall-cnt.htm>

National Falls Prevention for Older People Plan: 2004 Onwards

This Plan complements The National Injury Prevention and Safety Promotion Plan 2004-2014 and links with The National Aboriginal and Torres Strait Islander Safety Promotion Strategy. This document provides a strategic framework for collaborative action across jurisdictions, local government and organisations, to prevent falls and minimise fall related injuries in older people throughout Australia.

http://www.nphp.gov.au/publications/a_z.htm#n

Evidence-Based Health Promotion: Resources for Planning

No. 3 Falls Prevention

Produced by Public Health Division, Victorian Government Department of Human Services
February 2001

This evidence based resource provides an overview of the evidence and recommendations. The major aims of this review are:

- To develop a critical appraisal system for application to falls prevention programs.
- To critically appraise the community-based falls prevention programs identified.
- To identify a means to enable access to the information derived from these processes.
- To develop a database of recent community-based falls prevention programs in Australia.

Download the report: http://www.health.vic.gov.au/healthpromotion/downloads/falls_prevention.pdf

ACSM Position Stand on Exercise and Physical Activity for Older Adults.

Medicine and Science in Sports and Exercise., Vol. 30, No. 6, pp. 992-1008, 1998

Full text available from:

<http://www.acsm-msse.org/pt/pt-core/template-journal/msse/media/0698b.htm>

More on Tai Chi for Health & Falls Injury Prevention Program

<http://www.fallsprevention.org.au/thaichi.htm>

Falls Prevention for Older People

The Royal Australasian College of Physicians, funded by the Department of Health and Ageing, works to raise awareness of Falls Prevention. They provide web based information and interaction allowing all health professionals and interested members of the public to freely access relevant information, as well as participate in the project through online discussion. The website contains excellent resources.

<http://www.fallsprevention.org.au/index.htm>

DVC Active Living Grants: General overview of funded projects

<http://www.dvc.vic.gov.au/web19/osv/dvcosv.nsf/allDocs/RWP671EBB4261EB1D94CA2570C000091130?OpenDocument>

International Osteoporosis Foundation “Invest In Your Bones’ Publications

Titles include:

Exercise: Move It Or Lose It

Osteoporosis in the Workplace

Osteoporosis in Men

Available from the International Osteoporosis Foundation:

<http://www.iofbonehealth.org/publications.html>

Physical Activity and Bone Health

Maria A Fiatarone Singh, MD, FRACP, is Professor of Medicine, John Sutton Chair of Exercise and Sport Science, School of Exercise and Sport Science, University of Sydney, New South Wales.

This article provides a brief summary of current recommendations for effective and safe implementation of physical activity in various cohorts.

<http://www.racgp.org.au/Content/NavigationMenu/Publications/AustralianFamilyPhys/2004Issues/afp200403/singh20040311.htm>

Osteoporosis and Men Brochure:

<http://www.osteoporosis.org.au/files/osteo%20in%20men%20bro.pdf>

Sports Medicine Australia Fact Sheet Exercise and Osteoporosis

Includes a focus on athletes

http://www.sma.org.au/pdfdocuments/Fact_Sheet_5.pdf

COTA’s Living Longer Living Stronger Program

COTA Victoria’s Living Longer Living Stronger™ program has more than 7,000 people over 50 enrolled across Victoria who participate at 121 locations in individually supervised strength training programs.

The programs commence at the appropriate level for each individual and, over the course of 2 or 3 fully supervised sessions per week, strength training weights are gradually increased.

All instructors are fully qualified and encourage and support while instructing on correct technique and safety. Sessions cost no more than \$5 each and are held in an atmosphere that is fun, enjoyable and welcoming!

More info and providers http://www.cotavic.org.au/living_longer

Go for your life Fact Sheet: Exercise and Osteoporosis:

http://www.goforyourlife.vic.gov.au/hav/articles.nsf/pages/Osteoporosis_and_exercise?OpenDocument

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