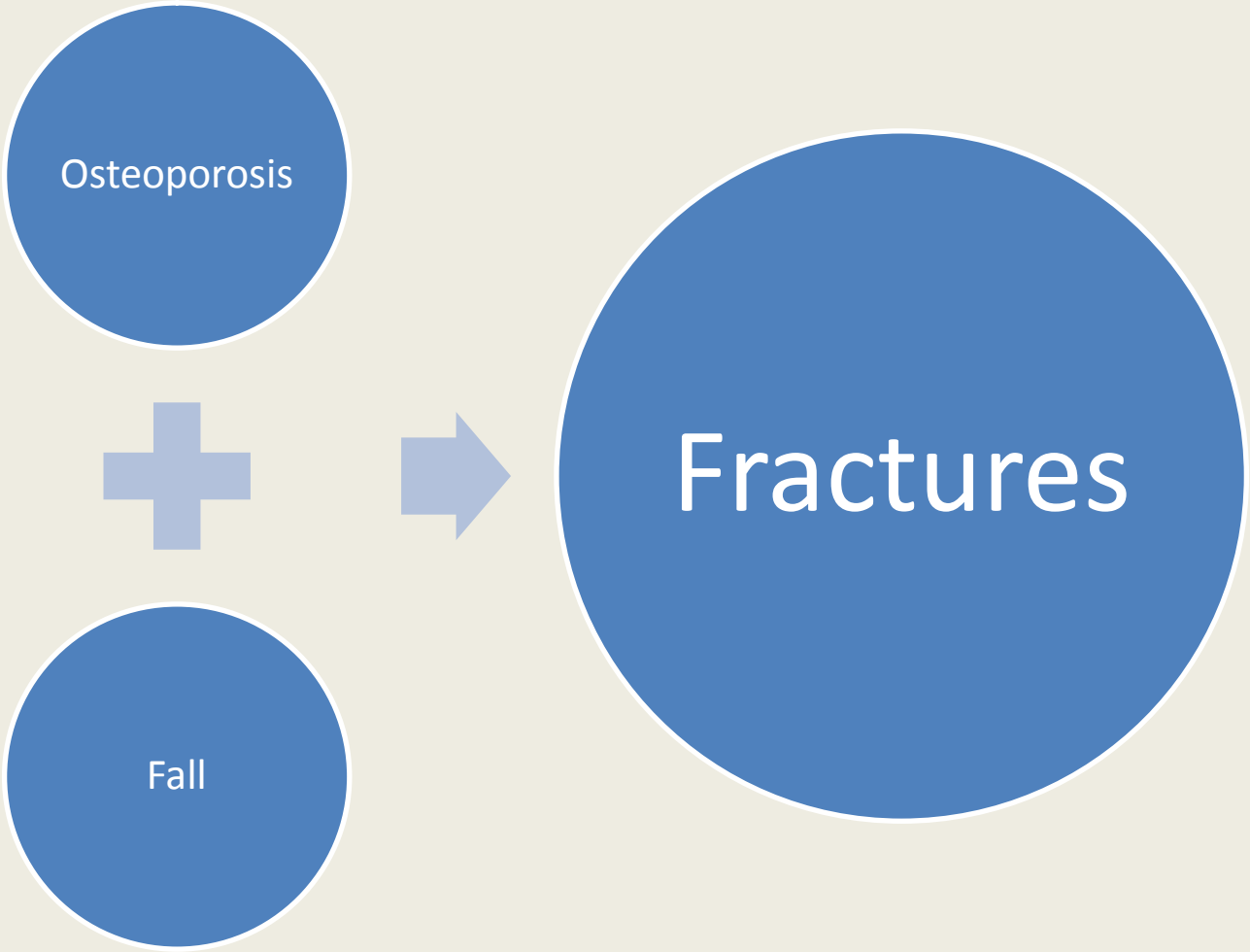
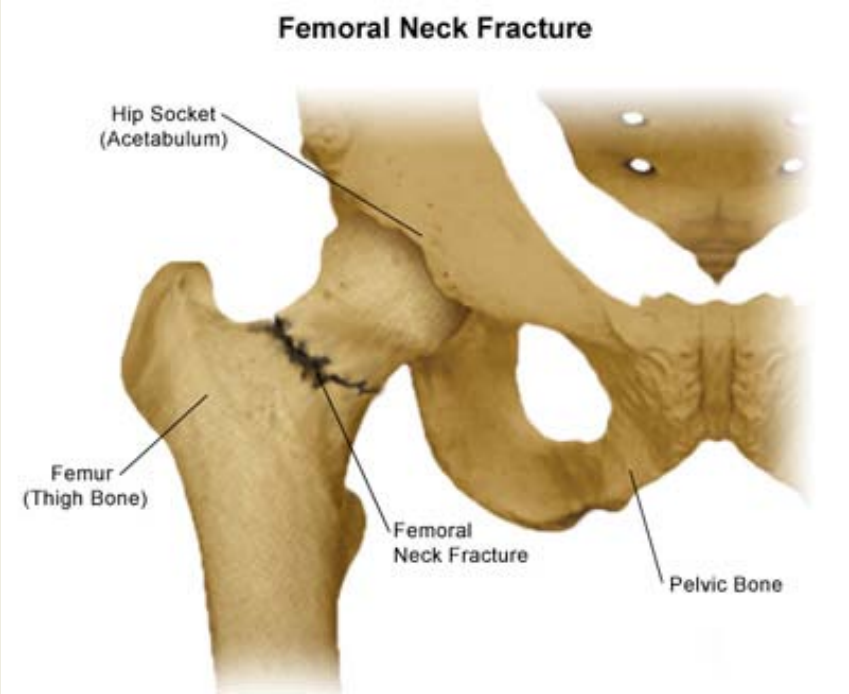
Exercise to build bones and prevent falls

Shylie Mackintosh

Osteoporosis does not increase the risk of having a fall but...





http://thebonearchitect.wordpress.com/2011/03/19/femoral-neck-it-doesnt-have-anything-to-do-with-your-spine/

Fractures - costly both to the individual and to the health system

Hip fractures

- neck of femur was the most common location

- 21,886 hip fracture hospitalisations 2002 /03
- 91% people aged > 65 yrs, 40% aged > 80 yrs

- 91% hip fractures associated with falling

(Kreisfeld & Newson 2006)

Management of Osteoporosis to prevent the first fracture

- Maintain / improve Bone
- Prevent falls

Treatment Choices

- Nutrition & Vit D
- Physical Activity & Exercise
- Drug Therapy

Vitamin D

- Also important for muscle

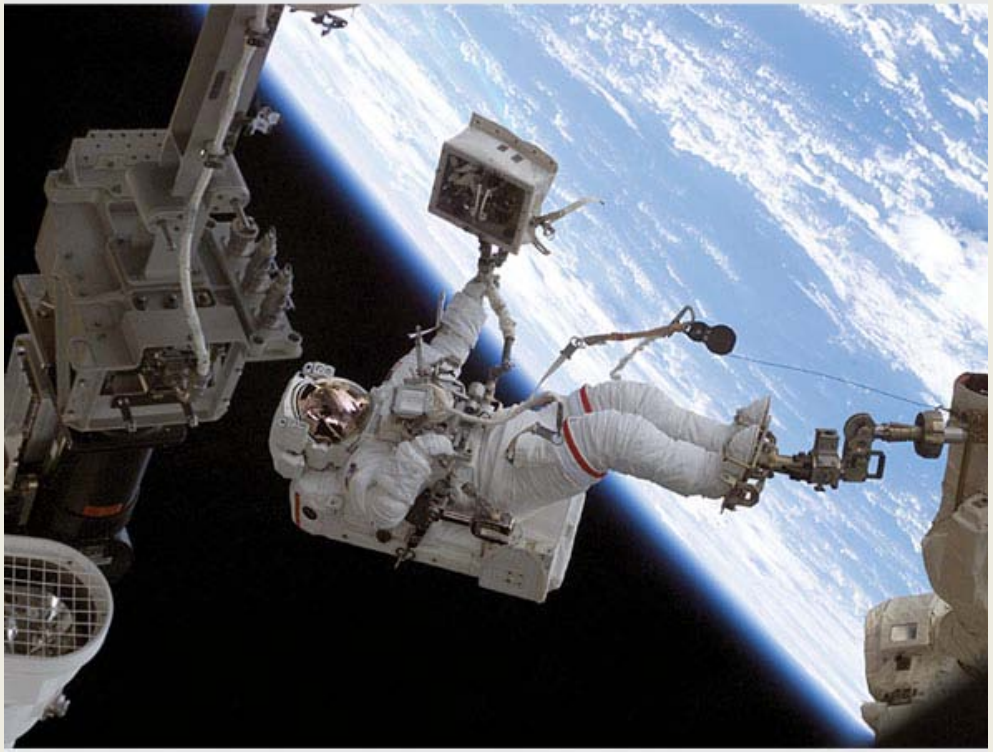
- Muscle weakness may be associated with vitamin D deficiency, common among older people because the skin's capacity to synthesise the provitamin calcidiol (25-hydroxycholecalciferol) decreases with age. (Venning 2005)

- Low serum vit D levels associated with decreased muscle strength. Changes in gait, difficulties in rising from a chair, inability to ascend stairs and diffuse muscle pain are the main clinical symptoms in osteomalacic myopathy. (Pfeifer M et al 2002)

Exercise & Bone maintenance are linked

- Building Bone when we are young
  - Diet & exercise, high impact activities
- Maintaining Bone as Adults
- Vulnerable times
  - Illness with bed rest
  - some conditions

Weight bearing / loading bone is important

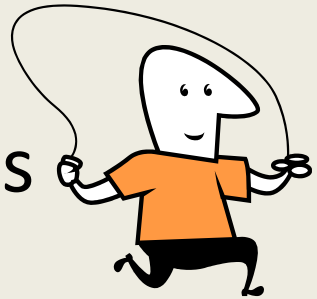


http://www.ama-assn.org/amednews/site/media/astrodocsatwork.htm

Bed rest

http://www.nsbri.org/photogallery/PhotoGallery.asp?id=447

Principles of Exercise to Maximise Bone Health

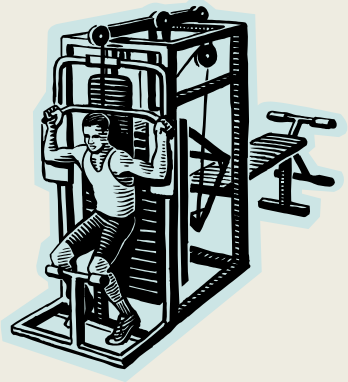


- Load bone through WB or muscle forces

- Lifting heavy weights more effective than light weights

- Target hip, wrist, Tx spine

(Fiatrone Singh 2006)



Principles of Exercise to Maximise Bone Health

- Rapid short burst of high intensity / high impact exercise
- Exs in short burst with rests better than long continuous bouts of exs
- Novel forces, i.e. change directions, different height jumps more stimulating to bone than repetitive force patterns

(Fiatrone Singh 2006)

If a person has already had a fracture

Added precautions

- See a Physiotherapist
- Avoid twisting / jarring activities
- Avoid high impact
- Avoid heavy lifting
- Avoid sudden abrupt movements

PREVENTING FALLS IS IMPORTANT

Preventing Falls

- Many reasons why people fall
  - Poor vision
  - Medications
  - Dizziness
  - Balance problems / weakness

Risk taking

Exercises to Prevent Falls – the evidence

- Sherrington et al 2009

Exercise reduced the rate of falling by 17% (44 trials; 9,603 participants), rate ratio 0.83, 95% CI 0.75–0.91

Greatest relative effects in programs that included a higher dose of ex **(>50 hours)** + **standing balance exercises**

- Gillespie et al 2010

Multiple-component **group exercise** reduced rate of falls rate ratio 0.78, 95%CI 0.71 to 0.86

Tai Chi – rate ratio 0.63, 95%CI 0.52 to 0.78

Individually prescribed multiple-component **home-based exercise** – rate ratio 0.66, 95%CI 0.53 to 0.82

In Summary

- The good news - the right sort of exercise can both prevent falls and strengthen bones.
- Types of exercise that have been shown to maintain or augment older people’s bones include weight bearing exercises, high impact exercise and strength training.
- Types of exercise that have been shown to reduce the number of falls by older people include strength training targeting the leg muscles and balance exercises.
- If upper and lower limb strength training and balance exercises are combined in weight bearing positions, then both bone health and falls prevention can addressed in one exercise programme.

So --- to maintain bone and prevent falls

Balance exercises

Strength exercises

Weight bearing exercise

South Australian Options for Exercise

- Strength for Life (COTA)
- Arthritis SA website has a list of classes

http://www.arthritissa.org.au/aspx/exercise.aspx

- SA Falls website

http://www.fallssa.com.au/

Strength for life

- promotes health and well-being amongst people over 50
- strength training programs
- run by accredited fitness providers
- South Australia (COTA)

http://www.seniorsvoice.org.au/aspx/strength_for_life.aspx

STRENGTH for life 50+

Programs
Every Generation
Networking Clubs in the Community
Peer Education Resource Centre
Physical Activity
Strength for life
List of Gyms
Fitness Programs Provided By Other Organisations
Tax Help
Volunteering
Programs FAQs

Strength for life

The Strength for Life program promotes health and well-being amongst people over 50 through strength
providers.

The program encourages older South Australians to attend strength training sessions by promoting the b

The program aims to increase access to strength training programs for people 50 years and over by trai
sessions throughout South Australia.

Interested in finding out more?
Click here for a factsheet about strength training and what Strength for Life can offer you.

Getting started
Contact your local accredited Strength for life fitness provider
Contact Us if you would like copies of the referral forms or the Pre-activity readiness questionnaire to ta
Contact Us for more information on the program

Arthritis
SOUTH AUSTRALIA

...get

membership
CLICK HERE

shop
CLICK HERE

donate & bequests

EXERCISE

If you have Arthritis or Osteo
starting with the right sort of

Arthritis SA recommends that you
exercise program. This is especia

- Known or suspected health con
- Severe arthritis or osteoporosis
- Any current injuries

Exercises not performed prop

Benefits of exercise include:

- Windows Internet Explorer

w.fallssa.com.au/

s Tools Help

n in SA

Falls Prevention in SA

search...

Maintain your independence, health and mobility.

Active Ageing Australia

Australian G

Department of H

Healthy Ageing for you

Community

General Practice

Residential Aged Care

Professional Development

Hospitals

Falls Prevention SA

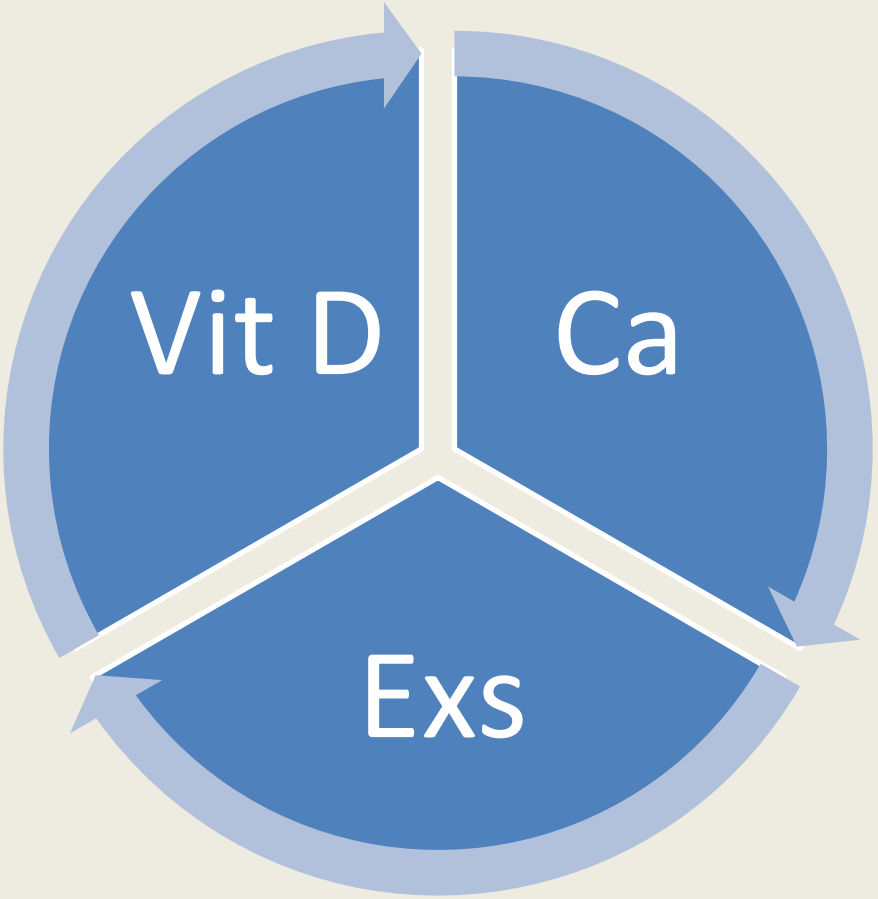
The 'Falls Prevention in SA' website provides a one-stop-shop of falls prevention a management information for members of the public, health professionals, Genera Practitioners, and carers.

You can access the information by clicking on the headings on the left hand side.

Community

A range of information is available to health professionals who have a client or pat they think is at risk of sustaining a fall, or who has previously fallen, including an a screening and referral care pathway which outlines the steps health professionals through when assessing a client's risk of falling.

Bone Health



Thank you &

QUESTIONS