

The European Musculoskeletal Arena – In Brief A Round-up of Trends, Statistics and Clinical Research

6.3 Million Hip Fractures by 2050

The number of hip fractures will reach 6.3 million per annum by 2050. That's the conservative estimate cited in a recent seminar on osteoporosis. Seminar authors Professor Philip Sambrook, of Royal North Shore Hospital, Australia, and Dr Cyrus Cooper, University of Southampton, UK, note that the number of fractures per annum may be expected to grow in correlation with an ageing population. Should incidence rates for hip fractures remain proportionally static for the aging demographic, it is estimated that the number of hip fractures worldwide will rise from 1.7 million in 1990 to 6.3 million in 2050. However, with strong evidence to support a belief that fracture rates are on the increase in many parts of the world, the authors assume an annual 1% rise, suggesting 8.2 million fractures by 2050.

A growth in incidence and the total volume of fractures will inevitably inflict a mammoth economic burden on healthcare systems worldwide. The seminar authors claim that the direct and indirect economic costs of osteoporosis fractures already totals US\$30 billion in the EU, and approximately US\$20 billion in the US. ■

Attaching Artificial Limbs

A new technology has been developed that allows artificial limbs to be connected directly to the human skeleton. Furthermore, scientists from University College London claim that despite the fact that the attachment involves securing a titanium rod into the bone, the technique does not risk infection.

The trials – conducted at Mount Vernon Hospital, Middlesex, England – involved patients who had missing fingers or thumbs. The use of the titanium rods enable artificial limbs to be attached directly onto human bone, in contrast to strapping artificial limbs onto the outside of the body, which is currently standard practise. Subsequently, the skin fuses around the rods to form an infection-preventing seal. Trial leaders Professor Gordon Blunn and Dr Catharine Pendegrass claim that the technique, called Intraosseous Transcutaneous Amputation Prosthesis, may play a key role in the development of artificial limbs where movement is controlled by the central nervous system.

It is thought that further development of this technique could permit the replacement of fingers and thumbs within

the next two years, and major limbs within five years. ■

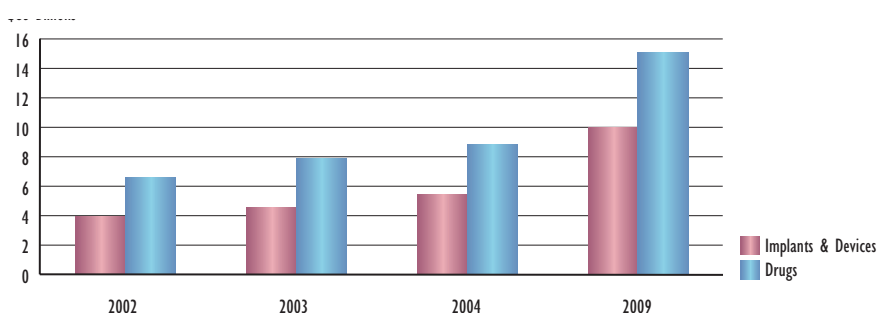
Low Oestrogen Levels Linked to Hip Fractures in Men

A recent study reported that men with low oestrogen levels have an increased risk of hip fracture, whilst those with both low oestrogen and testosterone levels have an even greater risk still.

The study, published in *The American Journal of Medicine*, was the first to report a link between low oestrogen and hip fracture in a general population male study group. Led by Shreyasee Amin, MD, a rheumatologist at Mayo Clinic, the study examined 793 men who had their oestrogen and testosterone levels measured between 1981 and 1983, and possessed no previous record of hip fractures. Followed until 1999, the men were categorised as having low, medium, or high levels of each hormone. In addition, the researchers recorded hip fractures of the study population not associated with high trauma events. Those with low oestrogen levels had a risk 3.1 times that of males of high oestrogen levels of experiencing a hip fracture.

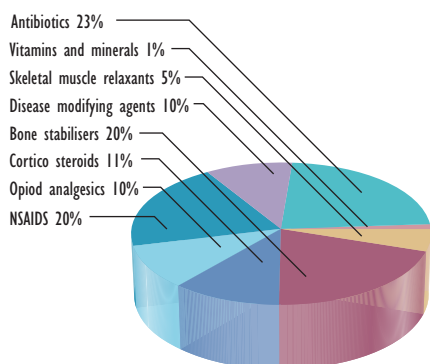
Whilst there was no tangible increase of risk of hip fractures in men with low testosterone levels, men with both low oestrogen and testosterone levels showed the greatest risk, with 6.5 times the number of hip fractures compared with men with high to mid-range oestrogen and testosterone levels. With up to 50% of men requiring institutionalised care after fractures, and a significant link with increased mortality levels following the fracture, it is hoped that these findings will help to better determine ways to prevent fractures. ■

European Union Sales of Orthopaedic Drugs, Implants and Devices, (2002–2009 Forecast)



Source: Business Communications Company

Global Sales of Drugs Used in Orthopaedics, by value (2004)



Source: Business Communications Company.

Building Bone Mass

Researchers at Stanford University have reported that they can increase bone mass in mice by altering the shape of a regulatory protein. Howard Hughes Medical Institute investigators Monte Winslow and Gerald Crabtree reported that marginally increasing the activity of protein NFATc1 leads to massive bone accumulation. The findings suggest that stimulating this protein – or others that regulate protein activity – could be ideal targets on which to base drugs designed to treat osteoporosis. Human bone is constantly being broken down and replenished, thus maintaining identical bone mass. However, often this balance is not maintained, resulting in osteoporosis and a subsequent rise in the risk of fractures.

The research was initiated after reports that patients treated with cyclosporine experienced a loss in bone mass. Winslow and Crabtree tested to see that if people with suppressed NFATc1 activity experienced bone mass reduction, this pathway could be key in bone development. Mice with stimulated NFATc1 activity in osteoblasts had many more bone-forming cells, which resulted in the increase in bone mass. “Very little NFATc1 requires activation to build extra bone. Therefore it may be possible to up-regulate the NFATc pathway to promote bone formation without disturbing other organ systems that use the same pathway,” Winslow commented. ■

Hereditary Link in Bone Marrow Lesions

Bone marrow lesions in the knee may be

hereditary, a recent study claims. The study, led by Guangja Zhai at St Thomas’ Hospital London, studied 115 children from 48 families with a significant historical presence of osteoarthritis. Through the use of magnetic resonance imaging, bone marrow lesions were assessed in the subjects, and the investigators subsequently calculated the extent to which the lesions – a major cause of pain in patients with knee osteoarthritis – may be hereditary. Calculations were conducted for the femur, and both medial and lateral tibias.

The investigators calculated the heritability estimate for the prevalence of bone marrow lesions in medial and lateral bone compartments to be 99%. Following adjustments to factor in variables – including height, age and sex – the heritability estimates for bone marrow lesion severity was 65% for medial bones, and 53% for lateral bones.

It is believed that the findings of this investigation may ignite further studies that

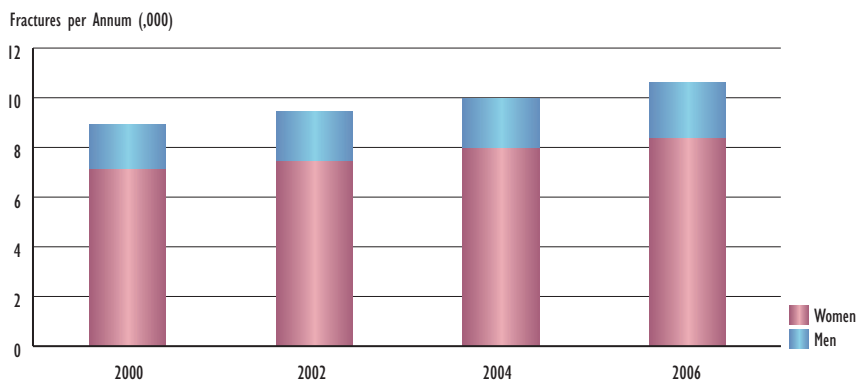
seek to identify genes responsible for bone marrow lesions. ■

Bone and Joint Pain More Prevalent Among Overweight Children

Adolescents who are overweight are more likely to suffer fractures and experience difficulty in knee joint movements than their normal weight counterparts. That’s the findings of a US study conducted by the National Institutes of Health. Over 350 children took part in the study. Classified into two groupings of overweight and non-overweight, the children then underwent physical examination and were questioned about whether they had experienced any bone or muscle related problems.

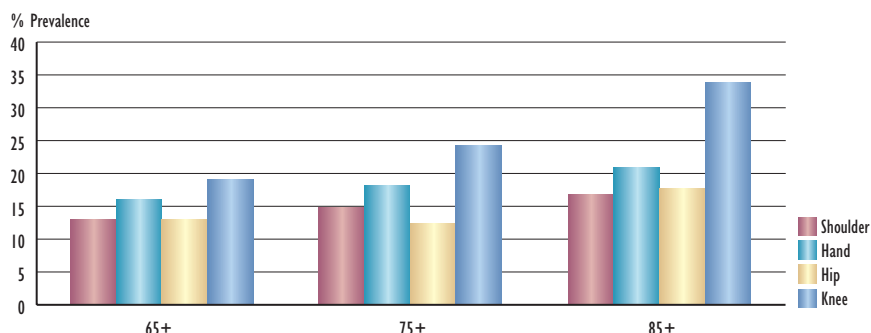
The most common joint complaint among the adolescent group was knee discomfort, report by over 21.4% of the overweight group, compared to 16.7% of the non-overweight group. The overweight group also experienced greater impaired mobility. ■

Figure 3: Number of Osteoporosis Fractures in Europe Per Annum (2000–2006 Forecast)



Source: Based on figures from the International Osteoporosis Foundation.

Figure 4: Prevalence of Joint Problems in European Population – Selected Age Groupings 2005



Source: Touch Briefings.