

THE INTERNATIONAL SOCIETY FOR FRACTURE REPAIR

NEWSLETTER

October 2007

The ISFR at EFORT 2007

It seems a long time ago now but our 5 days in Florence was well spent and there can't have been many delegates who left without knowing at least something about the ISFR and the Osteoporotic Fracture Campaign.

As predicted the highlight of the week was our Symposium on Burning Issues in Fracture Management. The room was full, the audience responsive, the chair (Antonio Moroni) in full control. Three papers were given:

- The biology of fracture healing in osteoporotic bone - David Marsh
- Burning issues in hip fracture management - Jörg Goldhahn
- The treatment of nonunion - Peter Giannoudis

The hero of the hour was Jörg Goldhahn who stepped into the breach at the last minute and did a fabulous job, when our original speaker was unfortunately unable to get there.

There were four other symposia on osteoporosis during the congress, showing that the issue has well and truly arrived in the collective orthopaedic consciousness. Our partners – the Bone and Joint Decade and the International Osteoporosis Foundation – were involved in these, as was the ISFR.

The Orthopaedic Surgeons Initiative CD, a series of teaching slides for use by anyone involved in fragility fracture treatment, produced by the IOF, ISFR and BJD, was very well received and proved a particularly useful draw for passing

delegates. If you would like a copy of this CD please get in touch.



For the first time the Newsletter has incorporated news from our Osteoporotic Fracture Campaign and in particular, reports on the UK National Hip Fracture Database and Blue Book on the care of patients with fragility fractures. We also feature papers from Amy Hoang Kim on managing hip fractures in the osteoporotic patient and principles of practice in clinical research, and Roy Sanders on internal fixation vs. arthroplasty in femoral neck fractures.

October finds us deep in preparation for our upcoming Australian workshop on the interaction between osteoporosis drugs and fracture healing. Attendance of these workshops, as you know, is by invitation and usually attracts a distinguished and knowledgeable speaker faculty. This workshop is no exception with 26 speakers from all over the world gathering at Byron Bay in New South Wales for a weekend of intense debate. The output from this workshop will be a paper summarising what is known and presenting evidence-based guidelines for orthopaedic surgeons and all doctors involved in the treatment of osteoporosis, including

recommendations for efficient multidisciplinary clinical systems.

Plans for our 11th Biennial meeting are well advanced (see below). I will be sending out posters for you to use in and around your institutions to generate interest and it would be great if you could pass these on to anyone you feel might be interested in attending.



11th Biennial Meeting of the ISFR
July 13 – 15, 2008

CALL FOR ABSTRACTS
On-line abstract submission at
www.fractures.com

Closing date: 8 January 2008

Mark your calendars and plan on joining us for the next Biennial ISFR meeting, which will be held July 13 – 15, 2008 on the South Shore of picturesque Lake Tahoe. The meeting will be held at the Harrah's Conference Center. Guests may stay at Harrah's Resort and Casino, or across the street at their sister hotel, Harvey's Resort and Casino. Flights into Reno/Tahoe

International Airport is available on most major airlines. Convenient shuttle service is available from there to the conference venue. In addition to excellent scientific sessions, the venue will offer exciting 'round the clock' activities including casino gaming, gourmet dining, and top name entertainers.

The meeting will directly precede the International BMP conference, which will be held at nearby Granlibakken Resort from July 9 – 13, 2008. Granlibakken is 40 miles away, and the drive there affords a beautiful view of famed Emerald Bay. Group transportation will be arranged for participants attending both meetings.

ISFR Participants may wish to plan a family vacation, or just extend their stay for a little rest and relaxation. Rand McNally has called Lake Tahoe "America's Number One Vacation Destination". Located at 6,200 feet above sea level, magnificent Lake Tahoe and the beautiful Sierra Nevada mountains are a paradise for outdoor lovers. The spirit of adventure tempts the willing with hiking, mountain biking, kayaking and all the trout fishing anyone could wish for, all located nearby. A kid's camp is also available daily at Harrah's for children ages 6 – 13. In addition, you might consider a visit to San Francisco or the Napa Valley, which are a 3 – 4 hour drive away.

THE OSTEOPOROTIC FRACTURE CAMPAIGN



UK National Hip Fracture Database and BOA-BGS Blue Book on the care of patients with fragility fractures

In the UK over 3 million people suffer from osteoporosis and a fragility fracture occurs every 3 minutes. The current statistic of 65,000 hip fractures a year in England and the predicted doubling of these figures by 2050 as the population ages, suggests the word ‘epidemic’ could be reasonably used when debating this issue.

The costs are well documented but worth repeating: in 2000 costs to the UK healthcare system for fragility fractures was estimated at £1.8 billion with the potential to increase to £2.2 billion by 2020 – most of which relates to hip fracture care.

The cost of hip fracture, in terms of reduced quality of life, is immense: loss of independence, loss of confidence, loss of home, pain and disability. After fracture there is a reduction in mobility and activities of daily living by 20-35% and from those admitted from their own home approximately 14% will be unable to get back there. A survey of the attitudes of older women found that 80% would rather be dead than experience the loss of independence and quality of life that may occur after hip fracture. ⁽¹⁾

Current models of care for hip fractures fall far short of the ideal and fail to bring together the key elements necessary for good quality care: prompt surgery, secondary prevention, good

medical care, early multidisciplinary rehabilitation and supported discharge schemes. Considering the complexity of that care which involves ambulance services, A&E, surgeons, anaesthetists, nurses, geriatricians, physiotherapists, occupational therapists, social services, primary care etc, it is perhaps not surprising a ‘joined up’ approach is hard to come by.

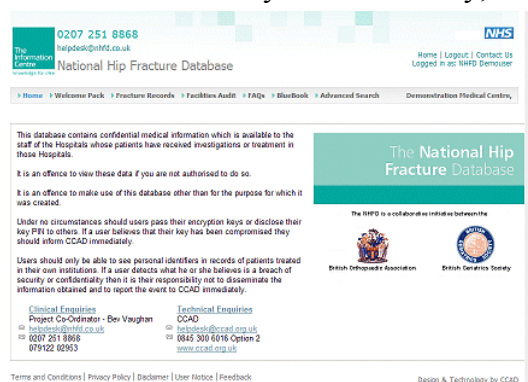
There is no doubt there has been significant service developments in recent years that seek to improve matters; notably the Scottish Hip Fracture Audit (SHFA) and Fracture Liaison Service (FLS). The SHFA, developed by a partnership of orthopaedics and geriatrics, monitors the hip fracture patient’s journey of care and records outcome at 4 months. The casemix-adjusted analysis allows units to see their strengths and weaknesses and learn from others. Similar audits are now established in Northern Ireland and several cities in England and Wales. The FLS was developed by endocrinologists and rheumatologists and systematically identifies cases of osteoporosis among patients presenting with low trauma fractures and initiates treatment to prevent a second fracture. This has been clearly shown to be the most effective system so far for getting osteoporosis treatment to the people who will benefit most. In addition, increasing orthogeriatric collaborations have shown that care can be improved and length of stay reduced, with advantages to patients and improvements in the cost effectiveness of services.

One vitally important thread running through these developments is the confirmation that good hip fracture care depends on a collaborative,

multidisciplinary approach. The development of orthogeriatric services and the recognition that the glass wall between osteoporosis doctors and orthopaedic surgeons needs to be comprehensively smashed, will be instrumental in ensuring that patients, particularly after their first fracture, can receive modern care over many years which integrates fracture prevention and treatment.

The National Hip Fracture Database (NHFD) and the 2nd Edition of the Blue book on the care of patients with fragility fractures are examples of this burgeoning spirit of collaboration between the British Orthopaedic Association (BOA) and the British Geriatrics Society (BGS), as a response to this massive public health threat. They share the same goals: to ensure that every patient presenting with a hip fracture receives excellent all-round medical care and rehabilitation, despite their many comorbidities; excellent surgery, despite the challenges of osteoporotic bone and reliable and effective secondary prevention, i.e. treatment of underlying osteoporosis or tendency to fall.

The NHFD aims to focus attention on hip fracture both locally and nationally, benchmark



its care across the

country, and use continuous comparative data to create a drive for sustained improvements in clinical standards and cost effectiveness. In addition, it will provide a platform for clinical research designed to demonstrate the value of innovations in all aspects of care, including surgery, rehabilitation and secondary prevention

as, unlike previous hip audits, the dataset will include action taken on secondary prevention for each individual patient. This will raise the profile of anti-osteoporosis treatment in fracture units generally and increase the likelihood of the NICE guidance actually being followed. ⁽²⁾ It will also give useful intelligence on the geographical variation in secondary prevention which will guide our efforts to improve matters.

The NHFD is led by an executive committee consisting of four people each nominated by the BOA and the Trustees of the BGS. They are David Marsh (Chairman), Rob Wakeman, Hamish Simpson and Chris Moran from the BOA and Finbarr Martin, Colin Currie, Jonathan Potter and Opinder Sahota from the BGS. A representative from the Royal College of Nursing, Karen Hertz, Project Manager, Maggie Partridge and Bev Vaughan, Project Coordinator completes the team.

A consortium of industrial partners, through their trade associations the Association of British Healthcare Industries (ABHI) and the Association of British Pharmaceutical Industries (ABPI), has granted £300,000 to fund the setting up of the database. This has allowed us to contract the services of an expert from the National Clinical Audit Support Programme (NCASP) to set up the database nationally and implement a web interface that fracture unit staff can use to deposit data and retrieve reports.

The first two priorities for the NHFD Project Team have been (i) to upload data from the existing hip audits in Northern Ireland, Oxford, Nottingham, Cardiff, Peterborough, Basildon and Manchester and (ii) to create a web interface to allow units without an existing audit to begin contributing data. To date we have uploaded data on over 10,000 hip fractures. This, and newly acquired data, will form the basis of our first national report.

The next stage will be to design reports that are the most useful as feedback to individual units and to use these to roll the process out, eventually to all UK fracture units. A National Steering Group will be constituted to decide on the uses to which the data will be put.

In parallel, the BOA and BGS, along with others,



have produced the second edition of the BOA Blue Book on the care of patients with fragility fractures, which will cover the considerable developments and advances in the four years since the first edition in 2003⁽³⁾. This

version has a wide authorship by a multidisciplinary team of experts including surgeons, geriatricians, physicians, anaesthetists, nurses and general practitioners, and represents the best statement of an integrated approach in the world at time of writing. So rapidly are things developing that we envisage this being the last edition to appear as a printed document and are planning the migration of it to a website with links to all the latest sources of evidence, guidelines and so on.

A model emerging as a strong contender for delivering both the Blue Book objectives and the NHFD data capture, is to have specialist nurses working in the fracture wards in an elderly trauma coordinator role, supported by consultant orthogeriatricians. We are working with the Society of Orthopaedic and Trauma Nursing – part of the RCN – to further this idea. We believe that the data collected for the NHFD will be valuable in arguing for improved resources from Trusts and along with improved quality of

care leading to reduced length of stay – the role will pay for itself.

Most importantly, the philosophical basis of both these initiatives and the synergy between them (guideline and audit – improving quality and reducing cost) will encourage fracture units to develop the interdisciplinary services for rehabilitation and secondary prevention which are so sorely needed and offer a powerful tool in pursuit of our goals.

The NHFD dataset and Blue Book can be downloaded from our website www.nhfd.co.uk.

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2. National Institute for Health and Clinical Excellence. Bisphosphonates (alendronate, etidronate, risedronate), selective oestrogen receptor modulators (raloxifene) and parathyroid hormone (teriperatide) for the secondary prevention of osteoporotic fragility fractures in postmenopausal women. *Technology Appraisal* 87. NB: This technology appraisal is currently being updated by NICE

3. British Orthopaedic Association. *The care of fragility fracture patients*. London: BOA, 2003

Maggie Partridge
NHFD – Project Manager

PRINCIPLES AND PRACTICE OF CLINICAL RESEARCH: HOW TO DESIGN, ANALYZE, AND PARTICIPATE IN ORTHOPAEDIC RESEARCH

AMY HOANG-KIM

ISFR RESEARCH PROJECT MANAGER



Course chairmen (from left to right):
Anders Jönsson, Emil Schemitsch, Mohit Bhandari

The first course on “Principles and practice of clinical research: how to design, analyze and participate in orthopaedic research” was held September 21-22, 2007 in Mississauga, Canada. The course chairmen were: Dr. Mohit Bhandari, MD (Hamilton Health Sciences General Hospital, McMaster University, Canada), Dr. Anders Jönsson (Osteosynthesis and Trauma Care Foundation, Nice France) and Dr. Emil Schemitsch (St. Michael’s Hospital, University of Toronto, Canada). The two-day conference drew 100 participants including first-year residents, surgeons, fellows, and Allied Health members and sessions were instructed by 10 faculty members.

With the ever-increasing demands to ensure proper research practice in orthopaedic surgery, we have designed this course to review the principles of clinical research. Whether leading a clinical

research study or participating as a site investigator, this course will provide the essential background to understand the “language of research”

M. Bhandari

While innovative technologies-- diagnostic, therapeutic or prognostic are introduced in orthopaedic surgery it is critical to take “an attitude of enlightened skepticism” as Gordon Guyatt (McMaster University, Canada) stated, “in their day-to-day management of patients”. Evidence-based orthopaedic surgery (EBO) is terminology and practice which we need to understand and adopt. The first randomized clinical trial (RCT) is most often credited to Sir Bradford Hill for his work with streptomycin and tuberculosis. The trial involved patient recruitment across multiple sites and randomly allocated patients by sealed envelopes to streptomycin and bed-rest versus bed-red alone. Outcomes (chest x-rays) were adjudicated by independent and blinded radiologists and clinicians. Streptomycin significantly improved patient survival. Sir Bradford Hill produced important guideless to the methodology of RCTs in the 1950s. In orthopaedic literature, we have indeed become familiarised with the hierarchy of research designs and the 5 levels of evidence as it is found in one of the principal orthopedic journals with high impact factor.

For therapeutic studies, the assignment of Level I includes:

- * High-quality randomized controlled trial with statistically significant difference or no statistically significant difference but narrow confidence intervals
- * Systematic review of Level-I randomized controlled trials (and study results were homogeneous)

Level II:

- * Lesser-quality randomized controlled trial (e.g., <80% follow-up, no blinding, or improper randomization)
- * Prospective comparative study
- * Systematic review of Level-II studies or Level-I studies with inconsistent results

Level III:

- * Case-control study
- * Retrospective comparative study
- * Systematic review of Level-III studies

Level IV:

- * Case series

Level V:

- * Expert opinion

According to the JBJS classification

This classification should not only help to serve as a critical eye toward the more higher level ranked studies but one should then be able to place the correct context around the conduct of a scientific study. This makes it useful for comparing clinical outcomes or collating similar data type for meta-analyses. A well-conducted study will mean not only achieving clarity for health researchers, scientists, surgeons and patients but it is also a way to steer away from avoidable confusion and consequently

squandering over ill-conceived research questions. Indeed one could avoid prescribing the disastrous effects of giving class I anti-arrhythmic drugs to people having heart attacks, which has been estimated to have caused tens of thousands of premature deaths in the United States alone.¹ Unrecognized confounding factors can interfere with attempts to correct for identified differences between groups. Furthermore, nonrandomized studies, or observational studies, have been reported to overestimate or underestimate treatment effects.

Learning these principles are foundations to what is already beginning to be reflected in the requirements of research funding organizations.

References and useful references:

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MANAGING HIP FRACTURES IN THE OSTEOPOROTIC PATIENT: WHAT IS THE EVIDENCE?

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Hip fractures are very frequent in the osteoporotic patient population. Hip fractures occur in 280,000 Americans (over 5000/week) and 36,000 Canadians annually. By the year 2040 the number of people aged 65 or older will increase from 34.8 million to 77.2 million. The number of hip fractures is likely to exceed 500,000 annually in the United States and 88,000 in Canada. The estimated annual health care costs will reach a staggering \$9.8 billion in the United States and 650 million dollars in Canada. Hip fractures are associated with a 30% mortality rate and profound temporary and sometimes permanent impairment of independence and quality of life. Furthermore, in the order of 30% of surgically treated hip fractures require revision surgery. These revisions are associated with a large burden of morbidity and mortality. The disability adjusted life-years lost as a result of hip fractures ranks in the top 10 of all causes disability globally.

Several surgical techniques have been proposed but not many papers provide results fully adhering to the principles of good evidence based medicine. The main objective of this year's upcoming AAOS Symposium is to review the evidence based outcomes of the different surgical techniques, which are now available for the osteoporotic hip fracture patient. The participants will learn how to diagnose and treat osteoporotic patients with hip fractures,

emphasis will be placed on the fixation techniques for femoral neck fractures, comparison of unipolar, bipolar and total hip replacement as well as cemented vs uncemented fixation, comparison of outcomes of fixation vs arthroplasty for femoral neck fractures, comparison of the different fixation techniques for trochanteric fractures including dynamic hip screw and intramedullary nailing, and furthermore the role of bone substitutes and orthobiologics will be evaluated

**FEATURED TOPIC AT THE UPCOMING
AAOS 2008 SYMPOSIUM, SAN FRANCISCO
SAVE THE DATE!**

**FRIDAY MARCH 7, 2008 TIME 4:00-
6:00PM**

MODERATOR: THOMAS A. RUSSELL, MD

- **INTERNAL FIXATION VS. ARTHROPLASTY IN FEMORAL NECK FRACTURES**
PHILIP KREGGOR, MD
- **OPTIMAL ARTHROPLASTY: WHAT IS THE EVIDENCE?**
ANTONIO MORONI, MD
- **SLIDING HIP SCREW VERSUS IMHS FOR INTERTROCHANTERIC FRACTURES**
MICHAEL BAUMGAERTNER, MD
- **TROCHANTERIC FRACTURES: WHERE ARE WE HEADED?**
THOMAS A. RUSSELL, MD
- **BONE SUBSTITUTES**
PETER GIANNOUDIS, MD

INTERNAL FIXATION VS. ARTHROPLASTY IN FEMORAL NECK FRACTURES

Roy Sanders, M.D.
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The current issues surrounding femoral neck fracture fixation have largely centered on whether or not internal fixation is justified in the elderly. A synopsis of the treatment algorithms based on available literature and clinical experience follows.

Femoral neck fractures (specifically subcapital fractures) were defined by Garden in 1961 as one of four types, each with a different prognostic outcome. These fractures occur just below the femoral head, and are all intracapsular fractures, that is, they cannot heal with callus. The biggest risks associated with these fractures are avascular necrosis of the femoral head and nonunion of the neck. This fracture must not be confused with a basicervical fracture, which by definition is extracapsular, and does not have the same complications, as it is in fact, an intertrochanteric fracture. The Toronto group in the 1980's, further refined Garden's classification by creating two groups A) stable fractures (Garden I/II), and B) unstable fractures (Garden III/IV). This allows us to evaluate outcomes quite clearly and permits more consistent treatment methods. One other type of fracture that is important to be aware of is the Pauwel's III, where a vertical shear fracture starts at superior neck at the base of the head, and travels

down to the inferior neck close to the inferior capsular insertion.

Importantly, Garden identified the need to obtain an anatomic reduction, coupled with stable fixation. While open reduction is not commonly employed today, stable fixation can be achieved thru a variety of implants. The only other variable that has any bearing on outcome becomes the patient's physiologic age. By this we mean, bone quality and overall health of the patient. Clearly, a 40 year old alcoholic in renal failure secondary to diabetes, will have worse bone quality than a healthy 70 year old who is fit, has no co-morbidities and plays golf 4 days a week.

Thus our algorithm must evaluate stability and age. Most of the current literature supports the use of internal fixation for stable fractures in both the young and old alike (2;4). Typical implants include 3 cannulated screws, placed into the neck, in an inverted V, under fluoroscopic control with the patient on a fracture table. A wide spread with care to avoid the posterior, superior neck and capsule is recommended. Asnis et al., had excellent results using this technique, and this has become the standard of care for Garden I and II subcapital fractures (1). Most other authors would agree with this approach (2;3;6;8;9).

In the elderly (>70 years) with a displaced femoral neck fracture (Garden III/IV), the literature is very clear that arthroplasty is superior to internal fixation. There are multifactorial reasons, but in general internal fixation of displaced fractures in the elderly are associated with high rates of failure due to symptomatic nonunion, and avascular necrosis (9). The ability to place a prosthesis as the definitive treatment method and thereby limit the reoperation rate, complication rate, and improve functional outcomes is overwhelming.

The unstable femoral neck fracture in patients under 50 years is almost always treated with attempts at reduction and internal fixation in an effort to maintain their own femoral head. Both Tooke et al, and Haidukewych et al., have shown good outcomes when internal fixation is employed (4;10). In Tooke's series patients that developed avascular necrosis did not always have symptoms sufficient to require arthroplasty as a salvage. In the series of patients presented by Haidukewych et al., there was an 85% 10 year survival rate of the original internal fixation. Finally, Jain et al, have suggested that in these patients, if a displaced femoral neck fracture is seen in a patient under the age of sixty who is healthy, surgery should be performed in less than 12 hours to possibly minimize the risk of avascular necrosis (5).

When an unstable fracture is encountered in a young patient an anatomic reduction is critical to obtain.

If this is not possible with closed methods, then open reduction using a Smith–Peterson, should be considered. Furthermore, while 3 cannulated screws may be adequate for an impacted stable fracture, displaced fractures are often associated with comminution and or may present as a Pauwel's III fracture. In both these instances, a sliding hip screw placed along the calcar, with a superiorly placed anti-rotation lag screw, may be the superior implant to maintain reduction and obtain healing of the neck (7). Again, although avascular necrosis may occur, this may not be symptomatic for some time to come.

The final question is the one that asks: what do I do with the healthy 70 year old with a displaced femoral neck fracture? Do I fix or replace it? Unfortunately, no one has a good answer to the question of treatment of a displaced neck fracture in the 50 – 75 year age range. While there is ample literature to support whatever argument one wishes to make, most of these series are underpowered and cannot answer the question raised. Therefore the surgeon must answer the following questions: 1) is the patient healthy or are there multiple comorbidities, 2) is the displaced fracture simple or comminuted, 3) can the bone quality tolerate internal fixation, 4) what is the patient's social situation, and finally, 5) what operation am I most comfortable with, that is, which one can I obtain the best result with. The answer to these 5 questions will define your ultimate treatment, which must be individualized to the patient.

Reference List

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MEETINGS OF INTEREST

54th Annual Meeting of the Orthopaedic Research Society
San Francisco, California, USA
March 3rd – March 5th 2008
Email: ors@ors.org

The American Academy of Orthopaedic Surgeons 75th Annual Meeting
San Francisco, CA,
March 5th- 9th 2008
www.aaos.org

1st Stanmore Fragility Fracture Course
Royal National Orthopaedic Hospital, Stanmore UK
March 12th – March 13th 2008
www.rnoh.nhs.uk/education

ISFR 11th Biennial Meeting
Lake Tahoe, California, USA
July 13th – July 15th 2008
www.fractures.com

IOF World Congress on Osteoporosis
Bangkok, Thailand
December 3rd – December 7th 2008
www.iofbonehealth.org/wco/2008/homepage.html

If you have any ideas or items for the Newsletter or any relevant event you would like to disseminate through us, please contact Maggie Partridge, ISFR Office, Institute of Orthopaedics & Musculoskeletal Science, RNOH, Brockley Hill, Stanmore, HA7 4LP, UK

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