The Care Gap in Osteoporotic Fracture Management: A Disconnect Between Hospital and Primary Care

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Any osteoporotic fracture predisposes to at least a two-fold risk in further fractures,1-9 significant morbidity and premature death.10,11 In a 2009 report of New South Wales hospital admission data from the Agency for Clinical Innovation (ACI),12 35% of patients with an osteoporotic fracture were re-admitted due to a further fracture over a 6 year period (2002-08). The re-admissions accounted for 97,347 bed days with an average length of stay of 22 days. However, this figure was most likely an under-estimate as the data only recorded re-fracture admissions to the same hospital as the index fracture.

For over two decades, we have known that the timely diagnosis and optimal treatment of osteoporosis prevents further fractures by up to 70% in these people. By now, several safe and effective medications are available13-19 and all osteoporosis guidelines recommend long-term treatment for people who have sustained a minimal trauma fracture.20-24 However, the international literature provides ample proof that the majority (i.e. 70-85%) of patients presenting with a minimal trauma fracture to their GP or hospital are neither assessed for osteoporosis, nor appropriately managed to prevent further fractures.25-31 This is highlighted in by two large retrospective studies of primary care practice in Australia, which demonstrated less than one-third of patients presenting with a minimal trauma fracture receive specific osteoporosis pharmaco-therapy.32,33

Thus, in Australia and internationally, there is a ‘disconnect’ between the initial fracture repair (which usually happens in hospital) and the subsequent assessment and management of the underlying disease (osteoporosis) in General Practice.

In response to this dire situation, a number of systematic interventions have been developed, ranging from education of patients and physicians to interventions that coordinate osteoporosis education, assessment and treatment in an all-encompassing service, known as a Fracture Liaison Service.
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(FLS) or Secondary Fracture Prevention (SFP) program. These programs have demonstrated that systematic, comprehensive interventions generate direct clinical benefits and are highly cost-effective.

There are a number of factors that contribute to the under-investigation and under-treatment of osteoporosis. Individual barriers include a lack of awareness and understanding amongst patients and doctors of the heightened risk of further fractures following a first fracture. Also, the significant benefits and the excellent safety profile of osteoporosis pharmacotherapy often go unrecognised. Patients are often misinformed of medication side effects and benefits. There is ample, high quality evidence from randomised placebo-controlled trials that antiresorptive agents (e.g., risedronate, alendronate, zoledronic acid, denosumab) and teriparatide (a bone forming drug) reduce the relative risk of fracture by 30 to 70%. Of note, data from these trials demonstrate greater risk reduction for vertebral (50-70%) than for non-vertebral fractures (30-40%). These agents thus have robust efficacy data, which undoubtedly outweighs the rare risk of osteonecrosis of the jaw or atypical femoral shaft fractures, which occur at a rate of 1 in 10,000 to 100,000 patient years.

Another common misconception is that treatment for osteoporosis after a minimal trauma fracture is only required if the DEXA scan reveals a bone mineral density in the osteoporotic range. However, once a person has sustained a minimal trauma fracture, treatment should be considered independent of bone mineral density as these patients are at high risk of subsequent fracture. This is reflected in the PBS rules: Once a prevalent or incident minimal trauma fracture has been identified, a BMD scan or T-score is NOT required for a patient to qualify for subsidised treatment.

Many healthcare professionals are hesitant to initiate treatment or to change management in response to the ‘sentinel’ event of a new osteoporotic fracture. Also, the responsibility for post-fracture care often gets diluted between several health care professionals, whether it is the primary care physician, orthopaedic surgeon or specialist physician. As a result the patient more often than not gets lost due to lack of post-fracture care coordination.

In summary, the post-fracture care gap represents a systemic failure of ‘disconnect’ between the hospital and general practice. The osteoporotic fracture is repaired in the hospital setting, yet there is no attempt to prevent the next fracture through osteoporosis assessment and treatment. Although there is strong trial evidence of anti-fracture efficacy with osteoporosis pharmacotherapy, in the majority of patients this evidence is not being translated into current clinical practice. In order to close this care gap, it is necessary to reconnect the acute fracture care in hospital and post-fracture osteoporosis management in the primary care setting. Secondary Fracture Prevention programs are ideally placed to bridge the gap but these programs need to be established in both hospitals and primary care. Such targeted and coordinated programs for the identification, assessment and treatment of patients with minimal trauma fracture provide an effective vehicle to deliver best evidence into clinical practice.

References available upon request.
New IOF report caution against automatic ‘drug holidays’ for osteoporosis

An editorial published by the International Osteoporosis Foundation (IOF) argues against the growing movement towards ‘drug holidays’ for osteoporosis, instead urging doctors to make treatment decisions based on individual fracture risk.1 Concerns around links between long-term bisphosphonate use and osteonecrosis of the jaw (ONJ) and atypical femoral fracture (AFF) have been compounded by recent media focus on reports that imply over-use of bisphosphonates.

Clinical trial outcomes in recent years indicate the importance of basing treatment decisions on individual fracture risk. An extension of the Fracture Intervention Trial (FLEX) demonstrated a significant increase in vertebral fractures after 5 years discontinuation of alendronate, compared to women who continued therapy for 10 years,2 indicating benefit of continuing therapy in women at high risk of vertebral fractures. Similarly, the HORIZON trial showed continued reduction in vertebral fracture risk with annual zoledronic infusions over 6 years, compared to those who stopped after 3 years.3

Discussion around the need for a drug holiday has been fuelled recently by fears of rare side effects. In reality, the incidence of ONJ and AFF is extremely low at the therapeutic doses used for osteoporosis. The American Society for Bone and Mineral Research (ASBMR) estimates ONJ incidence at between 1 in 10,000 and less than 100,000 patient-treatment years. The incidence of AFF is estimated to be between 2 in 100,000 after 2 years and 78 in 100,000 after 8 years exposure. Taking into account the substantial morbidity and mortality associated with vertebral fractures, the benefits of bisphosphonate therapy clearly outweigh the risks in women at high risk of fracture. The IOF also points out that adherence to bisphosphonates is low – clinicians may be making a bad situation worse by stopping treatment in the low numbers who actually take their medication.

The IOF stops short of making clear recommendations, but states that decisions should be based on individual fracture risk. Osteoporosis Australia’s Medical and Scientific Committee is broadly in agreement with recent recommendations from a respected US-based group:4

- T-score worse than -2.5 at the femoral neck after 3-5 years treatment: continue bisphosphonate treatment (highest risk of vertebral fracture)
- T-score worse than -2.0 in a patient with a previous vertebral or hip fracture: likely to benefit from continued treatment
- T-score better than -2.5 at the femoral neck in a patient without prior vertebral or hip fracture: unlikely to benefit from continued treatment (low risk of vertebral fracture).

There is much confusion around best practice, with little global consensus. Long-term trial data is scant and limited to post-menopausal women. More research is needed, in particular on how patients on ‘drug holidays’ should be monitored and when to re-commence treatment. In the meantime, it’s important for both clinicians and patients to remember that AFF and ONJ are extremely rare, but hip and spinal fractures are common and a major cause of disability and early death. The benefits of long-term bisphosphonate therapy for women at moderate to high risk of fracture far outweigh the risks.

References available upon request.
Surgical Improvements in Osteoporosis Fracture Repair

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Background
The burden on our society and hospital system from osteoporosis related fractures is high. There were 60,530 reported hospitalisations in 2012-13 for a principal diagnosis of minimal trauma fracture including the hip (31.2%), forearm (15.7%), lumbar spine and pelvis (12.3%). The actual number is far greater with many either not requiring hospitalisation (eg spine) or unrecorded at discharge. Hip fractures increased 18.4% in 10 years! With the challenges on subacute geriatric/rehabilitation resources, this also blocks acute hospital beds. There have been several areas in which advances have been made with the goal of improving outcomes. In addition to technical developments with surgical implants and techniques, there is a requirement for improved system approaches including improved perioperative assessment, quicker time to surgery and orthogeriatric models of care.

The poor quality and porous nature of osteoporotic bone leads to major fixation challenges for both repair and replacement options. Importantly the poor bone is often associated with a ‘poor host’ in terms of cognitive function, medical comorbidities, frailty and sarcopenia — all of which impact not only on perioperative management but rehabilitation potential. Surgical approaches have to be aimed at restoration of function sufficient to allow immediate mobility including unrestricted weight bearing as mobility restrictions are very poorly tolerated and lead to a cascade of further problems which contribute to the high morbidity and mortality in this cohort.

Technical Advances
The approach in most fractures is surgical repair which relies on the interplay between fixation device, bone properties and patient’s capacity for rehabilitation. Inability to restrict load necessitates solid initial fixation. Ongoing developments in locking plate technologies have significantly improved the surgeon’s ability to achieve solid fixation in many osteoporotic fractures, particularly around the wrist and proximal humerus where the risk of screw cut out and fixation failure are high. Essentially the head of the screw is designed to lock directly into the plate creating a fixed angle device with improved bone fixation. Traditional fixation relies on a better screw purchase to compress the plate to the bone with the screw head that is otherwise free to toggle in the plate hole (Figure 1).

Large anthropological studies have also allowed anatomical shaping of plates and associated targeting devices for less invasive surgery and to direct screws into predetermined parts of the stronger subchondral bone close to joints.

Techniques to improve the quality of bone fixation by addressing the bone deficiencies have also improved. Bone augmentation may be achieved using autograft, allograft, synthetic bone or cementing techniques.

Hip fixation has also changed with the evolution of intramedullary nails increasingly replacing the dynamic hip screw. Inserted percutaneously, they provide more reliable fixation with less fracture collapse and more anatomical healing whilst allowing unrestricted weight bearing for the more unstable fracture patterns.

Arthroplasty is used for fractures around joints not suitable for repair (too damaged to be fixed or require too long a delay in mobilisation). This is more commonly performed acutely for hip (hemi and total joint replacements) and shoulder fractures (hemi and ‘reverse’ total), but also knee and elbow arthroplasty. The successful implementation of the Australian Orthopaedic Association National Joint Replacement Registry is providing high level evidence for best practice.

New surgical approaches that limit collateral surgical damage and preserve biological healing potential such a fragment specific approaches are also contributing to improved outcomes.

Aftercare
Finally, essential to long-term success is multidisciplinary integrated care and follow-up for ongoing and sustained rehabilitation, bone health and falls assessment and secondary fracture prevention.

References available upon request.
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New Sun Exposure Guidelines

Peak national bodies, including Osteoporosis Australia, have collaborated to release new recommendations for balancing sun exposure and vitamin D intake in an effort to reduce the risk of skin cancer, while maintaining adequate vitamin D levels. In addition to Osteoporosis Australia, the recommendations have been jointly published by Cancer Council Australia, the Australasian College of Dermatologists, the Australian and New Zealand Bone and Mineral Society and the Endocrine Society of Australia.

The Cancer Council’s latest national survey found that almost a quarter of those surveyed had been advised by their doctor to get more vitamin D. However, the experts agree that adequate vitamin D can be obtained without risking skin cancer due to harmful UV exposure. The recommendations state that if the UV level is below 3, then sun protection is not required.

During summer, when the UV index is above 3 in all of Australia, most people can obtain sufficient vitamin D going about their daily activities and sun protection should be used if outside for an extended period of time. During winter, vitamin D levels are traditionally very low for most Australians. The experts have recommended that during winter, time is spent outdoors when the UV index is below 3 without sun protection. This will ensure that sufficient vitamin D can be maintained for bone health.

Some patients are considered at higher risk of vitamin D deficiency, including those who are naturally very dark skinned; avoid sun exposure because of a high risk of skin cancer; are frail and/or elderly, chronically ill or institutionalised and live largely indoors; take particular medications; have conditions causing poor absorption of calcium and vitamin D; or cover up for religious or cultural reasons. For these patients, if they cannot obtain sufficient vitamin D, then a supplement may be required if appropriate. Patients can check the UV index with the SunSmart app: cancer.org.au/SunSmartApp or visit www.myuv.com.au

Osteo-cise Pilot Shows Promise for National Roll-out

Osteoporosis Australia’s preventative exercise program, Osteo-cise: Strong Bones for Life, has just completed a pilot implementation in community fitness centres. Osteo-cise is a research and evidence based multi-modal community program designed to improve musculoskeletal health and functional capacity in the over 50s. Crucially, the program incorporates exercise specificity and progressive overload, targeting the muscles of the hip, spine and wrist.

38 trainers took part in practical workshops in 3 states, and over 300 fitness centre clients participated in the pilot. An unexpected but highly encouraging finding was the adaptability of Osteo-cise and its capacity for integration into established disease-specific exercise programs for the over 50s.

Recognising the potential of Osteo-cise to expand from its bone-specific foundation to address the multiple chronic disease priorities of the over 50s population, Osteoporosis Australia is seeking government support for a major re-development and national roll-out of Osteo-cise. The new program will include a web-based self-directed program for consumers, and the creation of GP referral pathways will be a significant feature. If support is granted, the new program is expected to launch in early 2018.
NEWS UPDATE

Resistance Training in the Spotlight
Osteoporosis Australia supported Fernwood Gyms launch of Lift the Nation in February to highlight the importance of resistance training for health. In terms of bone health resistance training must be done at high intensity to have a benefit and combined with weight bearing exercise as part of a regular exercise program. Fernwood gyms will be open for free from June 20-26 as part of the initiative.

Osteoporosis Australia bioDensity Equipment Award
The Osteoporosis Australia bioDensity Equipment Award was awarded to Professor Belinda Beck from Griffith University QLD. Her study will endeavour to determine how the bioDensity system can stimulate stronger bones in people who have low bone density. The results for this group will be compared to the results from a group who completed more conventional exercises.

Free and Flexible Active Learning Module (ALM) for GP’s
Do you need additional CPD Points? Our online ALM, hosted by ThinkGP is free and flexible. The ALM provides the details you need to effectively treat and manage osteoporosis and fracture risk as well as provide key bone-health information to at-risk patients. Accreditation includes 40 CPD Points with RACGP or 30 CPD Points for ACRRM. Register today at www.thinkgp.com.au/oa

Astronauts and Bedridden Patients Share Something in Common: Progressive Bone Loss
According to NASA, astronauts who spend many months on a space mission can lose, on average, 1 to 2 per cent of bone mass each month. They typically experience bone loss in the lower halves of their bodies, particularly in the vertebrae and the leg bones. The proximal femoral bone loses 1.5 percent of its mass per month, or roughly 10 percent over a six-month stay in space, with the recovery after returning to Earth taking at least three or four years. The loss of bone mass also triggers a rise in calcium levels in the blood, which increases the risk of kidney stones.

To help overcome the effects of bone loss while in orbit, astronauts have to engage in physical exercise for two and a half hours a day, six times a week during their stay in space. Although this does not completely eliminate the risk of bone loss, it does help to reduce it. Other studies are underway to investigate how to combat this issue.

Patients who remain immobile in bed over longer periods of time also experience rapid and progressive bone loss. Studies with ‘terranauts’ (healthy, young Earth-bound volunteers who lie flat without exercising for extended periods of time) have shown that completely immobilised bones can lose up to 15% of mineral density within three months. For ordinary Earth-bound people the message is exercise and bone maintenance are inextricably linked.

Source: IOF News