

SECONDARY PREVENTION OF OSTEOPOROTIC FRAGILITY FRACTURES IN PATIENTS WITH COLLES' FRACTURE

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A simple letter to the general practitioner after a fragility fracture could make a big difference to future fracture risk, argues Nick Kalson, a medical student at the University of Manchester. The work was undertaken at Stepping Hill Hospital, Stockport.

INTRODUCTION

Osteoporosis is a bone disease characterised by reduced bone mass resulting in increased bone fragility and hence susceptibility to fracture. It is an important public health issue for three reasons:⁽¹⁾

- osteoporosis is common in elderly people; 50% of white women over the age of fifty will sustain a fragility fracture⁽²⁾
- elderly people are the fastest growing population group⁽²⁾
- osteoporosis has devastating consequences⁽³⁾

The effect of osteoporosis on the skeleton results in increased risk not only of classic osteoporotic fractures of the hip, vertebral body and distal forearm, but of all types of fracture.⁽⁴⁾ Vertebral fractures are the most common whereas hip fractures are the most serious,^(1,2) requiring admission to hospital for surgery. Ten to twenty percent of hip fracture patients will die within thirty days; this rises to more than 26% when follow-up is extended to one year.⁽⁵⁾

Forearm fractures cause significant disruption to daily activities without the serious *sequelae* of hip fractures. However, these patients are at risk of sustaining subsequent fractures – a ten-fold increased risk of further forearm fracture and roughly two-fold increase risk of hip fracture during their lifetime.⁽⁶⁾ Therefore these patients are an important target group if prevention of serious fractures is to be achieved.

Osteoporosis is clinically silent until fracture occurs and there is currently no population-based screening service planned in the UK or elsewhere. However, it is a treatable condition; bone strengthening medication (BSM) such as bisphosphonates have been shown in large randomised control trials to reduce fracture rates up to 50% after one year of treatment.⁽⁷⁾ The efficacy of dietary supplementation with calcium and vitamin D alone in preventing osteoporosis has not been established,⁽¹⁾ but is co-prescribed with BSM. Therefore it is important to identify patients presenting with fragility fractures and treat them to reduce their risk of re-fracture.

There are no equivalent recommendations for management of men that suffer fragility fractures, but men over 50 years old suffering fragility fracture with risk factors for osteoporosis would reasonably be expected to be investigated and given appropriate treatment.

Audit Standards

National guidelines published by the National Institute for Clinical Excellence (NICE) make the following recommendations for the use of bisphosphonate or alternative medication in women with low-trauma fractures:⁽⁸⁾

- 50-65 year olds with a T score of <3.0 on DEXA scanning
- 65-75 year olds who have had osteoporosis confirmed by DEXA scanning
- >75 year olds without need of a DEXA scan

AIMS

Most patients with wrist fractures will present to their local Accident and Emergency Department (AED). We aimed to determine whether patients presenting to our AED with Colles' fracture were given advice on management of osteoporosis and whether they were being appropriately managed in the community according to national guidelines. More specifically we wanted to establish whether or not the system of informing general practitioners (GPs) and patients about osteoporosis, fracture risk and the need for secondary prevention⁽⁹⁾ had led to further improvement in appropriate assessment and prescribing of secondary prevention treatments. This being the case we would expect a higher level of achievement or a standard approaching 100%.

METHODS

Case identification

We identified all patients over 50 years old who presented to our AED between April and September 2007, and had been logged on the department's computer system with wrist injuries (n=152). Notes were available for 120 of these patients. Thirty-two patients were excluded from the study because:

- 12 had no fracture found on X-ray
- 10 had other types of fracture (8 scaphoid, 1 humerus, 1 radial head)
- 5 were men with high impact injuries
- 5 were women with high impact injuries

The remaining 88 patient notes were then reviewed. Briefly, the following information was recorded:

- injury mechanism and treatment
- medication at time of injury
- risk factors for osteoporosis
- prescription of medication in hospital
- referral for DEXA scanning
- referral to falls clinic

Community follow-up

The GPs identified from the casenotes of the 88 patients were contacted in the following February (2008), approximately six to nine months post-fracture. Each GP was sent a letter (see appendix 1) explaining the study and a small form to fill in (see appendix 2) to determine:

- appropriate referral for DEXA scanning
- any prescription of bone strengthening medication

A telephone reminder was given to those GPs who had failed to return the form within three weeks, and a further copy of the letter and form were faxed accordingly.

RESULTS

Demographics and risk factors for osteoporosis	
Patients	
Male	5
Female	83 (Post menopausal 83)
Race	
Caucasian	87
AfroCaribbean	1
Physical factors	
Immobility	12
Low trauma fracture	28
Falls	28
Medical conditions as risk factors	
Thyroid disease	15
Inflammatory bowel disease	4
Rheumatoid arthritis	2
Hysterectomy	8
Drugs as risk factors	
Steroids	9
Thyroid medication	9
Drugs as protective agents	
Bisphosphonates	5
Calcium/vitamin D supplements	8
Hormone replacement therapy	1

Data on smoking history, alcohol history and family history of osteoporosis was incompletely recorded

Treatment and secondary prevention at discharge

No patients treated as outpatients through the fracture clinic were prescribed bone strengthening agents. Of the 20 patients admitted for treatment, two were prescribed Calcium/Vitamin D supplementation, four were prescribed a bisphosphonate and one was prescribed strontium. No patients were referred for DEXA scanning from the hospital. Three patients had previously had a DEXA scan and a further six had already been scanned following the current wrist fracture episode, referred by their GP. Only one patient was referred to the falls clinic, and one patient was discharged from fracture clinic

Injury and treatment	
Injuries*	
At home	39
In the garden	16
In the park	9
Non-displaced	
Treated with back slab	43
Splint	36
Operation	4
Displaced	
Treated with back slab	2
Operation: wire	38
Operation: plate	14
Second operation	14
Comminuted	
Operation: plates or wire	8
Backslab or full cast	2
*Two thirds of injuries were sustained due to a fall when walking, 12 due to a fall when gardening	

with a letter to their GP from a nurse practitioner. This letter recommended DEXA scanning, although this patient was 78 years old. No other letters were sent, either from doctors or nurses, even when inpatients were discharged.

Community follow-up

We had a GP response rate of 82% (72/88) (see figure 1). Seven patients (10%) were excluded from further analysis as they were not treated or assessed for osteoporosis under the criteria of exception or for other reasons given by the GP (see table 1). The criteria for exception are contraindication, intolerance and patient compliance to bisphosphonates.⁽⁸⁾

Reason	Number
Patient declined treatment/scan	3
Patient deceased	1
Treatment not tolerated	1
Patient reported fracture due to trauma	1
Patient has bowel cancer	1

Table 1 Reasons for no treatment or scan referral from GP

Secondary prevention

The five patients already on bisphosphonate BSM at the time of fracture were still taking medication at follow-up. Thirteen out of 39 (33%) patients between the ages of 50 and 74 had a DEXA scan performed. Five patients out of 15 (33%) in the 50-64 group had a DEXA scan result at time of follow-up, of which two were treated despite the scan not showing severe osteoporosis (T score of -3 SD or below), three were waiting for a scan, and seven out of 15 (47%) were not referred for DEXA scanning. Nine out of 24 (38%) patients between 65-74 were sent for DEXA scanning, five of whom were diagnosed with osteoporosis, and all five patients received the correct treatment. Eight out of 26 (31%) patients over 75 years were treated with BSM without a scan. One patient (4%) had the DEXA scan performed after their fracture and was found to have osteoporosis, five (19%) had been referred and were awaiting unnecessary DEXA scans.

Table 2 shows rates of compliance with NICE guidelines. With regard to those aged between 50 and 74 who have undergone the DEXA scan, we have only included those patients who have actually had the scan performed and have not just been referred, as seven patients were referred for DEXA scanning prompted by the communication with the GP following this audit.

Age group	Treatment criteria	Compliance
50≤74 (n=43)	All to undergo DEXA scan	33%
50≤64 (n=16)	Bone strengthening medication prescribed only if patient has a very low bone mineral density (a T score of -3 SD or below) or a confirmed diagnosis of osteoporosis and have one or more related risk factors	33%
65≤74 (n=27)	Bone strengthening medication prescribed if osteoporosis is confirmed by DEXA	33%
≥75 (n=29)	Bone strengthening medication prescribed without the need for DEXA scanning	31%

Table 2 Compliance to NICE guidelines

DISCUSSION

We have found that patients suffering fragility fractures of the distal forearm were not being routinely investigated and treated for osteoporosis. The level of compliance to the NICE guidelines was low; approximately only one third of all patients were followed up for further treatment at six months post-fracture.

Outpatients were not discharged with a letter recommending lifestyle changes, investigation of, or treatment for osteoporosis. This is a simple intervention with proved efficacy.⁽⁹⁾ A related shortfall is the failure to refer patients to the falls clinic, as recommended by the British

Orthopaedic Association.⁽¹⁰⁾ There is inadequate provision of a falls clinic in our institution, and half of all fallers will have another fall within 12 months with risk of serious injury.⁽¹¹⁾

Patients had a significant history of both falls and previous fragility fractures yet only five were on BSM and only three had previously had DEXA scanning. Our sample had significant risk factors for osteoporosis; however, the recording of current medications and previous medical history in the AED or fracture clinic was often not performed and therefore these risk factors for osteoporosis appear to be largely ignored.

Community follow-up revealed the degree of under-treatment in patients with fragility fractures. The average waiting time for an NHS DEXA scan in the UK is 17 weeks (median 12, range 67).⁽¹²⁾ Patients in this study were followed up at six to nine months post-fracture. Considering that an estimated 20% of patients who sustain an osteoporotic fracture will experience their second fracture with the first year,⁽¹³⁾ patients should be referred immediately so that if osteoporosis is diagnosed, medication can be started as soon as possible. In our sample 67% of patients who required DEXA scanning had not been referred more than six months after the original fracture occurred.

It may be that due to the lack of correspondence between primary and secondary care, GPs are not aware that their patient has sustained a fragility fracture. However, the fact that some patients over the age of 75 had only been referred for DEXA scanning as a result of this intervention suggests that some GPs are not fully aware of the guidelines that are in

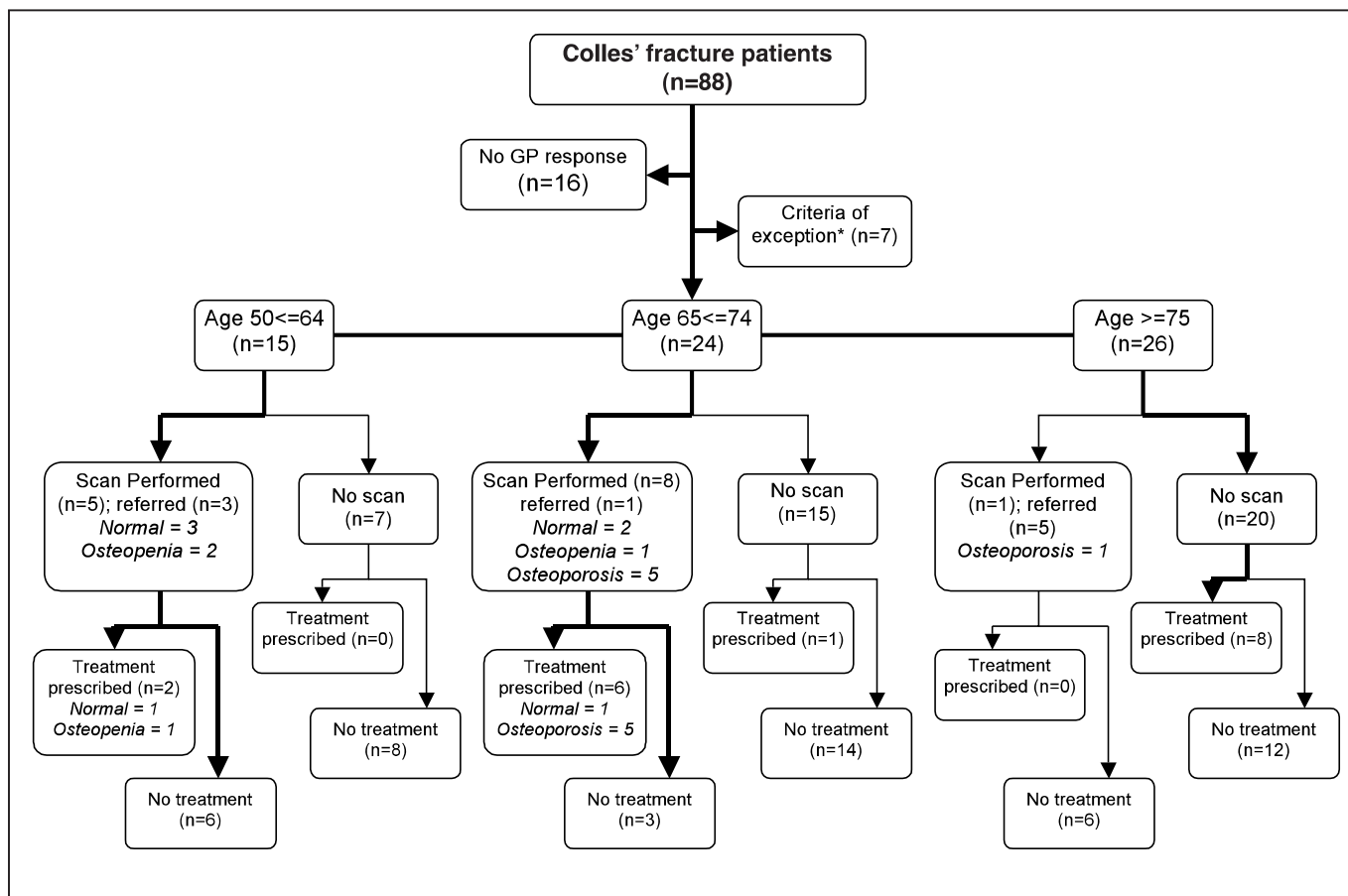


Figure 1 Flow chart of secondary prevention in the community. **Bold arrows** represent the standards that should be followed as recommended by NICE. * See table 1 for criteria of exception

place. Furthermore, the NHS can ill-afford to waste money on unnecessary DEXA scans for these patients when osteoporosis currently costs the NHS and the UK government approximately £2bn a year.⁽¹⁰⁾

We included men in the study despite no guidelines for their management being available. It is likely that the low numbers of elderly men suffering from fragility fractures has resulted in their management being overlooked. Improvement in this area is something to work towards – not only women suffer from low trauma fractures. In addition, the current guidelines fail to include treatment recommendations for patients who are diagnosed with osteopenia. Early intervention at this stage could improve prospects for such patients who may develop osteoporosis in the future.

There is a gap in the management of these patients, a finding consistent with previous studies.⁽¹⁰⁾ We must therefore ask, 'Why is secondary fracture prevention so badly managed?' There is a systematic failure to recognise these injuries as fragility fractures and there is no current treatment pathway in place in the orthopaedic department for signposting of these patients by the Trust into primary care. As the patient may not routinely see their GP following discharge from the fracture clinic it seems unlikely they will be investigated and treated.

Studies have attempted to shed light on the reasons behind the lack of organised investigation and treatment of osteoporosis.⁽¹³⁾ It seems more sensible for patients to be referred from the hospital fracture clinic for DEXA scanning rather than relying on GPs to refer. However, current NHS commissioning policies may restrict the ability of hospital doctors to refer patients internally for DEXA scanning, as without a formal referral from primary care the provider organisation would not be paid. Furthermore, there is no Quality Outcomes Framework target in general practice for dealing with osteoporosis prevention. In the absence of these triggers for action it is not surprising that follow-up has been poor. Nonetheless some GPs still undertake secondary prevention work despite these obstacles and perhaps a better understanding and sharing of how this has been achieved may help improve local services.

In our institution, there has been significant effort targeted at secondary prevention in admitted patients with fractured neck of femur.⁽¹⁴⁾ Previous work with wrist fracture patients has shown that such a simple intervention as a discharge letter encourages patients to visit their GP and results in an increase in referrals for further investigation and treatment.⁽⁹⁾ Despite the 25% increase in the proportion of patients being treated as a result of this intervention it has been abandoned consequent upon the frequent change of junior medical staff working in the fracture clinic and loss of a consistent clinical lead.

With our ageing population it is prudent to implement interventions for secondary prevention. The discharge letter to inform GPs that their patient has sustained a fragility fracture has been reintroduced. The simple process of providing a letter outlining the current NICE guidelines along with a clinical letter on all fragility fracture patients may significantly improve matters. Once such a system is in place, repeating the audit again after one year may be appropriate.

Increased awareness of fragility fractures amongst doctors and nurses working in the fracture clinic would flag

osteoporotic injuries up at an early stage. This could be achieved through simple intervention such as notices on the walls or more advanced changes such as the implementation of a fracture liaison service (FLS). The introduction of a fracture liaison nurse to identify the fragility fractures and ensure investigation and treatment is implemented has proven efficacy.⁽¹⁵⁾ Such a service would fill in the missing link between orthopaedic surgeons and GPs to ensure investigation and treatment is implemented. However, a lack of funding opportunities within our institution has been the major stumbling block in proceeding with an FLS.

Furthermore, local GPs and other hospital trusts nationwide need to be made aware of these findings, hopefully encouraging similar audits and interventions and providing a more proactive approach in the secondary prevention of osteoporosis in patients with Colles' fracture.

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PEER REVIEW

The editor invited a senior colleague in the Trust to comment on this audit and is grateful to him for his insight. John Halsey is a consultant rheumatologist at the Royal Lancaster Infirmary.

This timely audit was performed before the publication in October 2008 of guidelines produced by the National Osteoporosis Guideline Group (NOGG) and the NICE technology appraisal guidance 161 '*Alendronate, etidronate, risedronate, raloxifene, strontium ranelate and teriparatide for the secondary prevention of osteoporotic fragility fractures in postmenopausal women.*'

NOGG guidance is based on FRAX[®], which uses clinical risk factors and bone mineral density to estimate an individual's ten-year fracture probability. This guideline uses a tool to make recommendations about the need for therapy which is available online at www.shef.ac.uk/NOGG.

Even though NOGG guidance was published under the auspices of the World Health Organisation by a distinguished team of international experts and published in *Osteoporosis International*,⁽¹⁾ NICE has not been persuaded by the recommendation that treatment decisions should be based on absolute fracture risk using FRAX[®].

The NHS is mandated to follow NICE guidance rather than NOGG guidelines. However, for the majority of patients the outcome of these guidelines is similar as alendronate is the treatment of choice for the secondary prevention of fragility fractures in postmenopausal women who are confirmed to have osteoporosis (that is, a T-score of -2.5 SD or below). In women aged 75 years or older, a DXA scan may not be required if the responsible clinician considers it to be clinically inappropriate or unfeasible. For those patients who fail to respond to, or are intolerant of alendronate, the NICE guidance is, in my view, rather cumbersome to use and restrictive in availability of alternative therapies.

I suspect that this audit from Stockport is very representative of the national situation in which patients with fragility fractures are not managed optimally in accordance with these national guidelines, which are aimed at reducing the burden of osteoporosis and the associated increased risk of future fractures.

An effective fracture liaison service is essential and a proven tool to reduce this burden and improve patient management. Who should take the responsibility for the development of such a service represents a major challenge for health organisations, particularly now that NICE guidance has been published, as there is an obligation that funding and resources for recommended medicines and treatments should be available within three months of the date of publication (ie, January 2009).

This challenge poses the local NICE implementation group with its *raison d'être* and their effectiveness can be judged in the future by using the audit support tool published online at www.nice.org.uk/Guidance/TA161.

According to the costing template provided by NICE the estimated cost of this secondary prevention guidance is £92,199 per year for a population of 300,000, with estimated savings of £27,618.

Excellent patient support literature is available from the National Osteoporosis Society (go to www.nos.org.uk) which should be available in all fracture clinics and general practitioners' surgeries to improve patient awareness of osteoporosis.

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APPENDIX 1 – GP LETTER

Dear Dr,

Re. Secondary prevention of fractures in patients with Colles' fractures

The orthopaedic department at Stepping Hill Hospital are investigating the prevention of secondary fracture following Colles' fracture. We identified patients presenting to A&E during April – September 2008 with Colles' fracture of the distal radius. The below listed patient(s) were included in the study.

Patient 1: *Patient name* **DOB:** *Patient DOB*

We would like to follow up with you to determine the following information

1. Whether bone-strengthening medication has been prescribed
2. Whether bone mineral density (DEXA) scanning has been
 - a. referred
 - b. scheduled
 - c. performed

Our initial results suggest that efforts in our department to identify patients with low trauma fractures are failing. This leaves the bulk of the work for primary care – we would like to determine, with your help whether these patients are being picked up, or if there needs to be intervention and active targeting, which will require more close work between the hospital and primary care.

I enclose a sheet which will enable you to easily fill in the required information. If you could complete and return this to us then I would be most grateful.

Of course our results will be disseminated to GP practices in the area. We anticipate this will be in March 2008.

Thank you,

Yours sincerely,

Consultant Orthopaedic Surgeon, Stepping Hill Hospital

APPENDIX 2 – GP FORM

Patient name _____	ID number _____
Medications prescribed	
bisphosphonate – name _____	
calcium –	
vitamin D –	
Strontium – other _____	
Dexa scan	
referred – date _____	
scheduled – date _____	
performed – date _____	
→ Normal –	
or Osteopenia –	
or Osteoporosis –	