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Orthopedic surgeons' attitudes to osteoporosis investigation and management after minimal trauma fracture

J Anderson-Wurf

The University of Notre Dame Australia, jane.anderson-wurf@nd.edu.au

J McGirr

The University of Notre Dame Australia, joe.mcgirr@nd.edu.au

A Seal

The University of Notre Dame Australia, alexa.seal@nd.edu.au

C Harding

The University of Notre Dame Australia, Catherine.Harding@nd.edu.au

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Title:

Orthopaedic Surgeons' attitudes to osteoporosis investigation and management after minimal trauma fracture (MTF).

Authors: **Anderson-Wurf, J., McGirr, J., Seal, A. and Harding, C.**

Running title: **Orthopaedists and osteoporosis care after MTF**

Abstract

Background

The investigation and treatment of osteoporosis after minimal trauma fracture (MTF) is regarded as sub-optimal. There is strong evidence of the benefit of identifying and treating osteoporosis after MTF and there has been discussion of the possible role that orthopaedic surgeons might play in the management of osteoporosis after MTF.

Questions/purposes

The study surveyed orthopaedic surgeons in rural and regional south east Australia to determine their attitudes to investigation and management of osteoporosis, the role health professionals should play, and the communication and co-ordination of follow-up care.

Methods

A survey was developed and piloted prior to being posted to 69 orthopaedic surgeons asking for their opinions about the general management of osteoporosis, and the roles and responsibilities of health professionals in dealing with osteoporosis following a MTF.

Results

Responses were received from 42 participants (60.8 %) with the majority of respondents agreeing that it is important to treat osteoporosis following MTF. Less than 15 % of respondents felt that it was their responsibility to initiate discussion or treatment or investigation after MTF. No respondent felt that the co-

ordination of osteoporosis care was good and 45% stated it was poor. Communication after discharge is mostly left to the hospital (30%) while 20% stated they did not follow up at all.

Conclusions

This study shows that many rural orthopaedic surgeons believe that follow-up in regard to osteoporosis after MTF is important, that responsibility for follow-up diagnosis and management of osteoporosis lies with primary health care and the current communication systems are poor.

Introduction

Osteoporosis often remains under-diagnosed even after a Minimal Trauma Fracture (MTF) occurs (1, 2). These fractures, which result from a fall from a standing height or less that would not be expected to fracture a healthy bone, are an indicator of high risk for subsequent fracture (3). Despite this, the majority of patients receive no effective treatment for osteoporosis (1). It is estimated that 66% of Australians aged over fifty have osteoporosis or osteopenia and in 2012 the total cost for Australia was estimated at \$2.75 billion (3). Osteoporosis, designated as a National Health Priority Area in Australia since 2002, places increasing burden of disease on older Australians, their families and carers, as well as the health care system and the economy (4). Health departments in several Australian states have published strategies to improve osteoporosis care and the Royal Australasian College of General Practitioners has developed evidence based clinical guidelines for the diagnosis and treatment of osteoporosis (2). MTF or fragility fractures are increasingly one of the most prevalent trauma conditions dealt with by orthopaedic surgeons (5) and there is strong evidence that identification and treatment for low bone density after MTF can prevent fractures (6). However, the level of involvement of orthopaedic surgeons in the osteoporosis patient pathway remains unspecified.

Harrington (7) describes a “Bermuda Triangle of Osteoporosis Care”(p.S484) where orthopaedic surgeons do not investigate or initiate treatment of osteoporosis yet general practitioners are not informed that patient fractures have occurred. Australian medical practice also shows a ‘disconnect’ between recognition of a MTF and subsequent investigation (8). One approach to solving this issue has been the establishment of fracture liaison services (FLS) within the last decade. Hospitals with a FLS have shown a 30- 40% reduction in re-fracture rate (9). While this may be a promising solution in metropolitan areas, health services in regional and rural locations may not have the capacity to operate comprehensive FLS (10). Therefore, there may be a greater need for involvement by orthopaedic surgeons in the prevention of further fractures in patients with osteoporosis in rural and regional settings.

The purpose of this study was to determine the views of rural orthopaedic surgeons on (1) the investigation and treatment of osteoporosis in MTF patients; (2) the role of orthopaedic surgeons and general practitioners in the diagnosis and treatment of osteoporosis after MTF and (3) the communication and the coordination of osteoporosis care after MTF.

Methods

Following a comprehensive literature review and consultation with three independent orthopaedic surgeons, a survey comprising 14 questions was developed. Questions were either multiple choice with single answer, multiple choice with multiple answers or ranking questions using a Likert Scale. Questions addressed respondents' opinions about the general management of osteoporosis, roles and responsibilities of health professionals in dealing with osteoporosis following a MTF and the exploration of reasons for possible non-involvement of orthopaedic surgeons in osteoporosis diagnosis, treatment and management.

The names of 69 orthopaedic surgeons practicing in rural and regional New South Wales and northern Victoria were selected using practice contact information from the Royal Australian College of Surgeons website and the internet. Ethics approval was received from the University of Notre Dame Australia's Human Research Ethics Committee.

The survey design and recruitment strategy were based on Dillman (11) and Pit *et al* (12). An invitation letter introducing the study was mailed to all 69 orthopaedic surgeons one week prior to mailing the project packages containing a participant information sheet, a questionnaire and a self-addressed stamped envelope. No remuneration was offered to the participants. Within a fortnight, 23 of the 69 questionnaires (33%) had been returned and a follow-up reminder was sent four weeks after the initial mail out with the option of returning the questionnaire by fax or post. The overall response rate was 60.8% (42/69).

Statistical analyses were carried out using SPSS Inc. (Version 22; Chicago, IL, USA) software using descriptive statistics. Pearson's chi-square (χ^2 test) was used to analyse categorical variables, with significance set at $p < 0.05$. Where respondents were required to rank options, each participant's first preference was used to determine the most important factors and where several responses could be ticked, all responses were ranked of equal importance. This meant that some cumulative totals were greater than 100%.

Results

Questionnaires were posted to 65 male and 4 female orthopaedic surgeons working in rural and regional practice with a gender distribution in the 42 respondents of 93% male and 7% female. All participants were aged over 35 years and were evenly distributed across three age brackets (Table 1). While only 9.5% of orthopaedic surgeons had been in practice for <5 years, there was a relatively even distribution of orthopaedic surgeons within the last three 'years in practice' categories.

Table 1: Characteristics of participants

| Characteristic | | Participants [% (n=42)] |
|--------------------------|----------|-------------------------|
| Gender | | |
| | Male | 92.9 (39) |
| | Female | 7.1 (3) |
| Age (years) | | |
| | 35-45 | 38.1 (16) |
| | 46-55 | 35.7 (15) |
| | ≥ 56 | 26.2 (11) |
| Years in practice | | |
| | <5 | 9.5 (4) |
| | 5 to 10 | 31.0 (13) |
| | 11 to 20 | 26.2 (11) |
| | >20 | 33.3 (14) |

Almost all the orthopaedic surgeons surveyed (98%) agreed with clinical guidelines that suggest all patients presenting with a MTF should be investigated for osteoporosis. The importance of treating osteoporosis following a MTF was rated as either high (50%) or very high (45.2%) by the majority of respondents. When asked if MTF patients who have not had a Bone Mineral Density (BMD) scan in the previous two years should be followed up with a BMD scan, 43% indicated sometimes and 43% always.

When asked about the need for more education for orthopaedic surgeons about osteoporosis, 53% of orthopaedic surgeons felt there was enough information currently available, whereas 26% thought the amount of information available was limited. Opinions were divided as to whether more education about osteoporosis in primary care is needed with one third (31%) indicating more education was required; one third (29%) indicating additional education was not necessary as enough information is available; 22% indicating that information is available but not accessed; and the remaining 18% indicating they did not know.

The majority of orthopaedic surgeons either agreed (61.9%) or strongly agreed (19%) that if an orthopaedic surgeon discussed osteoporosis with a patient following an MTF, it would likely improve patient compliance with management. Fewer than 15% of respondents agreed that it was their role as orthopaedic surgeons to initiate discussion about osteoporosis (14.3%) and only 7.1% felt it was their role to assume leadership in the treatment of osteoporosis following an MTF. When respondents were asked to select any number of possible reasons from a predetermined 5-item list as to why they may not initiate osteoporosis treatment, 47.6% indicated that they did not see it as their responsibility and 40.5% highlighted that they did not have adequate time to address the issue. Almost 24% had concerns about the side effects of treatments while an additional 7% felt there was insufficient evidence available to support treatment (Figure 1).

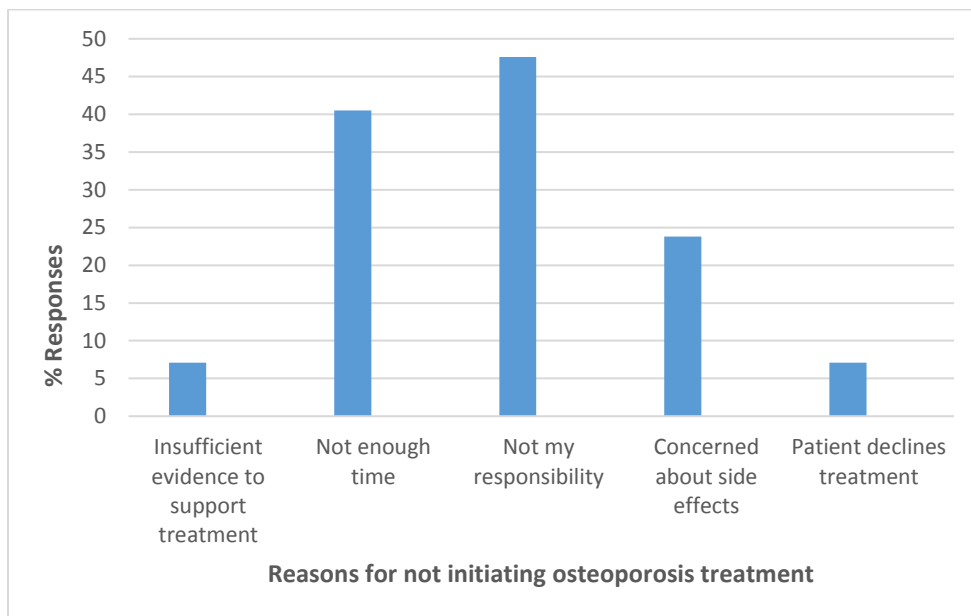


Figure 1 Reasons for orthopaedic surgeons not initiating osteoporosis treatment

(*Note: total does not = 100% due to the option to select multiple possible reasons)

Although 33% felt that orthopaedic surgeons should assume leadership for the diagnosis of osteoporosis, 45% of respondents felt that this was the responsibility of the GP. More than 70% of orthopaedic surgeons reported that GPs should provide leadership in initiating treatment and 85% reported that GPs should provide the leadership for ongoing management of osteoporosis (Figure 2).

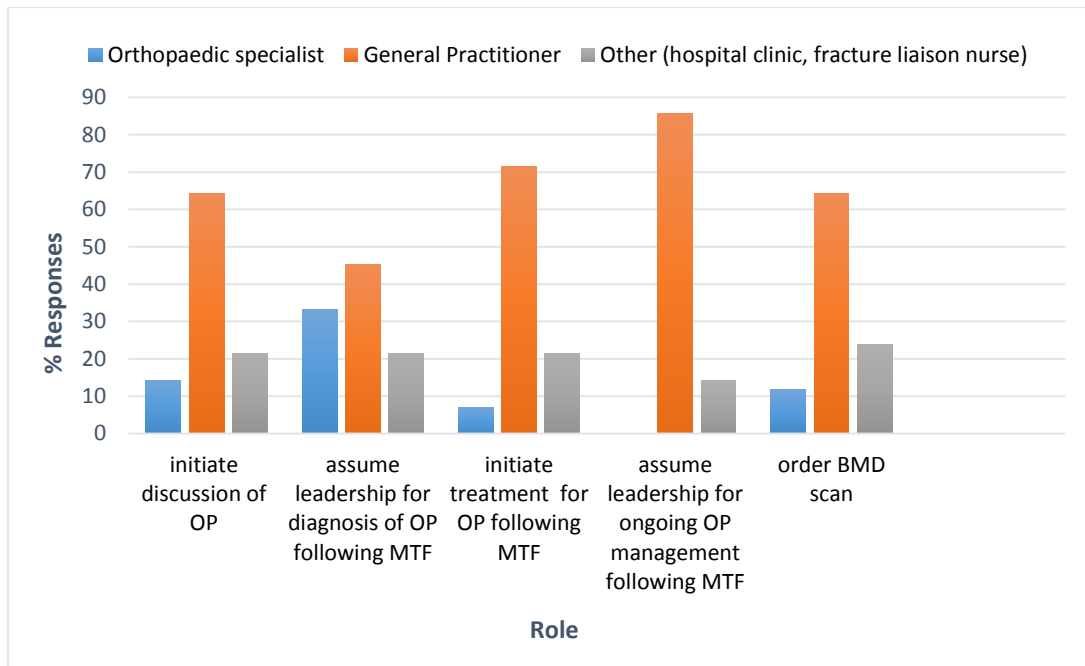


Figure 2 Various roles best performed by different professions

(*Notes: total does not = 100% due to the option to select multiple possible reasons; OP = osteoporosis)

Only 12% considered it their responsibility to order a BMD scan with the majority of respondents (50%) indicating that it is the GP's responsibility (Figure 3). One quarter reported that they do not order a BMD scan as the result will not change management.

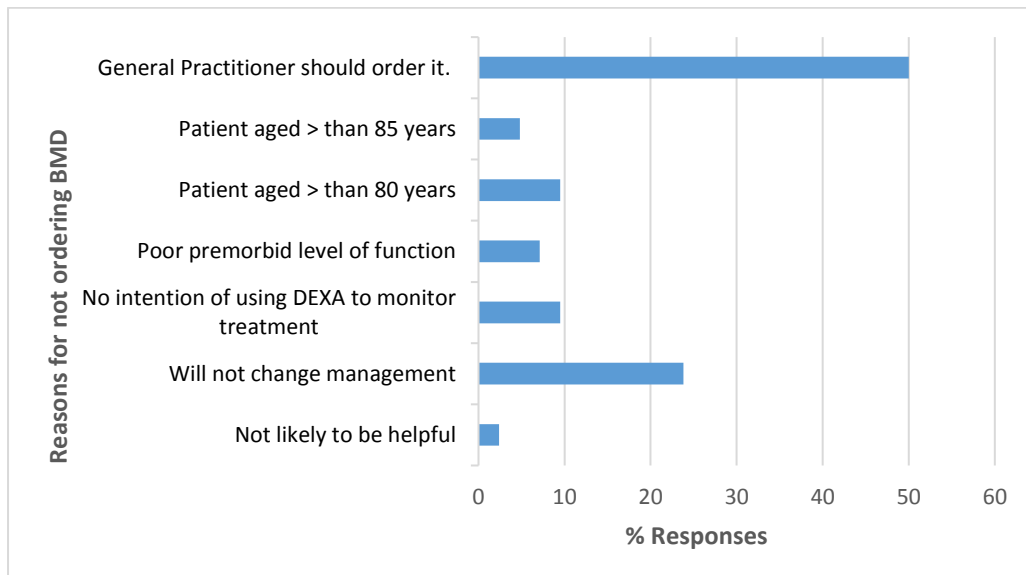


Figure 3 Reasons for orthopaedic surgeons NOT ordering a BMD scan

(*Note: total does not = 100% due to the option to select multiple possible reasons)

In general, orthopaedic surgeons reported that the co-ordination of osteoporosis patient care between hospital and general practice is either mostly unsatisfactory (45.2%) or poor (23.8%); none of the respondents deemed it to be good.

Regarding coordination of care, 30% rely on the hospital to provide communication after discharge and 20% indicated they did not follow up at all. When communicating with general practice, only 30% stated they either wrote a diagnosis of osteoporosis and/or a recommendation for therapy for osteoporosis in the discharge letter to the GP.

Orthopaedic surgeons were asked about the communication methods they used to notify the GPs that an osteoporosis workup should be carried out (Figure 4). The results were mixed with a variety of communication means utilised and no one process favored over others. No orthopaedic surgeon indicated they ever personally phoned the GP. Overall, the discharge letter to the GP was used by more than 60% of orthopaedic surgeons to either indicate a diagnosis of osteoporosis (28.6%) or a recommendation that the GP instigate osteoporosis therapy (33.3%).

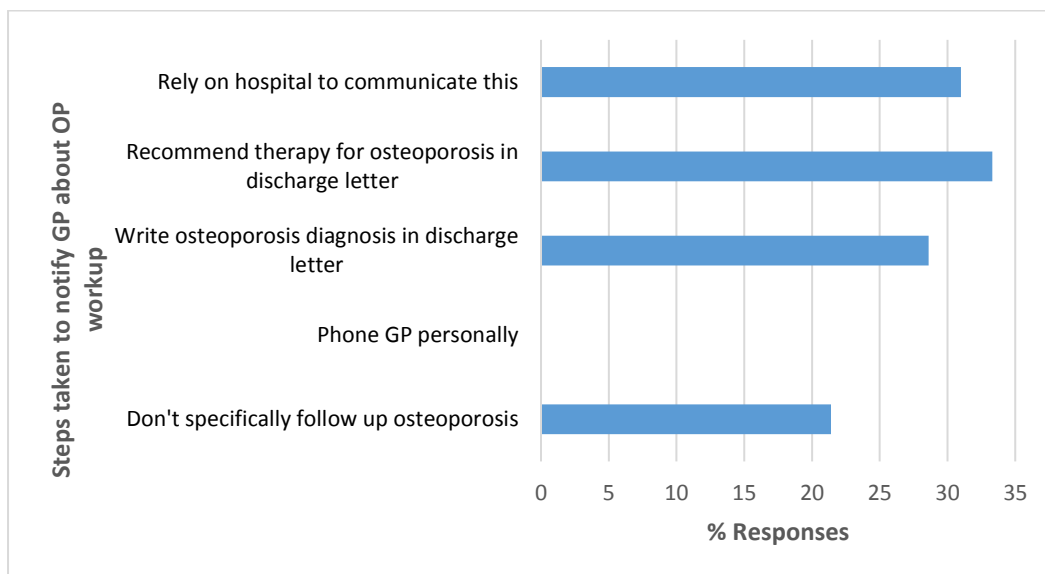


Figure 4 Steps taken by orthopaedic surgeons to notify the GP that an osteoporosis workup should be carried out.

(*Note: total does not = 100% due to the option to select multiple possible reasons)

Discussion

There is literature to support the view that there is a role for orthopaedic surgeons in the investigation and treatment of osteoporosis after MTF (13-15) either by referring at-risk patients for follow-up or by personally initiating investigation and/or treatment for osteoporosis (16). There is also evidence to suggest that despite attempts to engage orthopaedic surgeons on this subject, their actual participation is low and changes in attitudes towards involvement in osteoporosis management have been minimal (17, 18).

In this study, only 14% of orthopaedic surgeons agreed that it is their responsibility to initiate osteoporosis follow-up after a patient sustains a MTF. This is despite the fact that over 80% agreed that if the orthopaedic surgeon discusses osteoporosis with a patient following a MTF it would improve patient compliance with management and more than 90% rated the need for treatment of OP following MTF as high or very high. This apparent contradiction may be due to barriers such as lack of time (13); lack of knowledge regarding ordering of BMD scans; and the need for prescribing medication (16, 19-21). The findings of this study are consistent with an international study comparing knowledge of orthopaedic surgeons and internists managing osteoporotic fractures in 22 countries. This study revealed that although 83% of orthopaedic surgeons reported they felt knowledgeable in managing osteoporosis, overall they were neither inclined to participate in the management of these patients nor interested in referring them for post fracture medical treatment (16). Similar results were reported in a UK study where orthopaedic teams showed poor compliance with published guidelines for following up after MTF (22).

It was clear that the orthopaedic surgeons in the current study considered that the GP should assume overall responsibility for osteoporosis investigation and management. Over 60% of respondents indicated that GPs should be responsible for initiating a discussion about osteoporosis, ordering BMD scans, initiating treatment and leading long term management of patients with the disease. It has been suggested there is a role for orthopaedic surgeons in the initiation of treatment by providing leadership for the initial investigations and communication with the GPs (23). However, often the GP is not aware that their patient has sustained a MTF as too often this information is not transmitted back to primary care practitioners (5, 17, 18, 24, 25). Indeed, poor co-ordination of care between the hospital and primary care systems was considered an issue by almost 70% of respondents in the current study.

Interventions such as “Own the Bone” in the US (24) and “Capture the Fracture” in the UK (26) describe the push for the orthopaedic surgeon to play a crucial role as the first health professional to ensure the patient is

evaluated for osteoporosis risk and “maximise the opportunity for successful remobilisation” (1). The American Orthopaedic Association’s *Own the Bone* initiative recommends that orthopaedic surgeons be more aggressive in their responsibility for managing patients at risk for osteoporosis (23). In both inpatient and outpatient fragility fracture programs there is an expectation that the orthopaedic surgeon plays an integral role by including diagnosis of osteoporosis in all hospital documentation and on the discharge summary (15).

Attempts to improve the osteoporosis follow up of patients with a MTF have seen the establishment of Fracture Liaison Services (FLS) (27). Some evidence indicates that where an FLS has been established, orthopaedic surgeons were more likely than other specialty surgeons treating vertebral compression fractures to address osteoporosis or refer patients for osteoporosis management (28). A systematic review and meta-analysis on the effectiveness of models of care for secondary prevention of osteoporosis fractures by Ganda *et al.* (29) showed that FLS were effective in improving osteoporosis care after MTF, although even the most comprehensive services fell short of optimal follow-up levels.

Even though some success in involving orthopaedic surgeons in osteoporosis care has been achieved with the introduction of FLS, overall, there remains a lack of ownership (19) and reluctance on the part of orthopaedic surgeons to become involved in osteoporosis care after MTF (17). The role that the orthopaedic surgeon is expected to play is unclear, particularly in hospitals where FLS have not been established or access to such services is limited such as in rural and remote areas (30). In addition, there is unlikely to be the same number of health practitioners practicing in non-metropolitan areas (6) and therefore the role of orthopaedic surgeons is potentially more important.

However, if we are to ask orthopaedic surgeons to take on a role in opening discussions about osteoporosis with patients and referring to primary health providers, there needs to be a strategy to engage them. This could be a limited role that, nevertheless, would have a powerful impact. Furthermore, the role would need to be supported by a system for ensuring communication to the patient’s GP and follow up on investigation and results, but, in many instances referral pathways between providers of acute care and long term chronic care have not been established (26).

This study shows that there may be a reluctance by the majority of regional orthopaedic surgeons to engage in osteoporosis care following MTF. We found that orthopedic surgeons think that treatment of osteoporosis is an important issue and while they agree that co-ordination of care is important, there is a belief among them that

the majority of osteoporosis care should be undertaken by the GP. This would indicate that to improve osteoporosis care after MTF in regional settings, alternative options need to be investigated.

This paper suggests that one way to improve osteoporosis follow-up may be to engage orthopaedic surgeons in a more active role, such as in an “Own the Bone” type model. However, co-ordination and communication with follow-up would also need to be more robust with greater engagement with primary care. In rural and regional areas, establishment of systems for follow-up is most easily achieved through primary care. The difficulty is that if GPs are not informed that a fracture has occurred, the gap in osteoporosis care following MTF will never be closed.

This study has several limitations. Firstly, the participant group was restricted to orthopaedic surgeons practicing in south eastern Australia who were selected using publicly available information. The views expressed by this cohort may not be reflective of all the orthopaedic surgeons who work in rural and regional areas. Secondly, data were collected using a survey which limits the information to responses to closed questions whereas greater depth of opinions could be achieved via interviews with orthopaedic surgeons. The use of a postal survey may have meant that only those doctors with an interest in the topic would be disposed to completing and returning the survey. On the other hand the survey response of more than 60% would mitigate this concern.

Despite this study and other published studies which have identified that gaps exist in the osteoporosis follow-up in the care cycle we still have limited understanding as to why many orthopaedic surgeons are reluctant to participate on this issue. Further exploration through personal interviews with orthopaedic surgeons would enable more in-depth discussion of barriers and possibly offer some solutions to the problem as to why they continue to remain disengaged on this issue.

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