

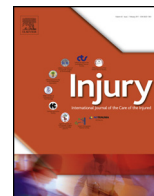


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## Development of fracture liaison services: What have we learned?

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### ABSTRACT

Due to dramatic improvements in life expectancy we are seeing a rapidly growing population of older people. Increasing frailty and susceptibility to fragility fractures are becoming pressing issues for both the individuals that suffer them as well as society, through pressures on health and social care budgets. The success of fracture liaison services, co-ordinated programmes enhancing the management of the fracture, osteoporosis, frailty and falls risk, is undisputed. To achieve optimal outcomes, however, it is important to have a standardisation of design, scope and structure of the service. Experience has taught us that by delegating responsibility for the holistic care of the patient to a trained and adequately resourced professional/team (fracture prevention practitioner) with clear standards against which benchmarking occurs, is the optimal model of delivery. Future challenges include how best to measure the success of services in imparting a reduction in fractures at a local population level as well as how to detect those patients with unmet need who do not uniformly present to health care services, such as those with vertebral fractures. The implementation of fracture liaison services however, is a clear demonstration of how collaboration between health care, social care and charity organisations, among others, has materially improved the health and well-being of the population.

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### Introduction

Medical and societal changes mean that people are living longer. With increasing age, however, come the risks of frailty that can express themselves in many ways, including an increased tendency to fall and fracture. Even with relatively minor trauma, fractures may ensue, fragility fractures that can have catastrophic consequences to the individual through attendant mortality and morbidity. Furthermore, in addition to the personal costs of such fractures, the societal and economic impact of fragility fractures is increasingly evident in the growing older frail cohort. Loss of independence and reliance on the state for care and support as well as the direct health care costs of fragility fractures has spurred global interest to innovate and effectively prevent fragility fractures through introducing models of clinical service that identify those at risk and then effectively intervene to prevent subsequent fractures – fracture liaison services (FLS).

Fragility fractures are defined as fractures occurring as a result of a fall from standing height or less. They primarily affect older people in whom osteoporosis and increased risk of falls are contributory factors [1]. Morbidity and mortality is significant; in England 1 in 4 people die within a year of suffering a hip fracture, with a doubling in the standardised mortality ratio in the first year [2,3]. In those who survive, there are far reaching, long-term consequences and complications such as loss of confidence and independence, which can also have a negative impact upon those providing a caring role.

Fracture prevention programmes have evolved over the last two decades and have taken many shapes, mostly targeting those presenting with their first fracture. Early strategies attempted to identify patients and convey patient-focused (or sometimes GP-focused) written material regarding fracture prevention; such strategies did not result in large scale treatment uptake with no clear evidence of significant change in incidence of fractures. However, more sophisticated and highly effective fracture prevention programmes, such as FLS, assess patients through clinical interactions that instigate all necessary investigations, referrals and treatment with longer term follow up to ensure adherence. Adopting these more sophisticated fracture prevention models (through FLS, see Fig. 1) can reduce hip fracture and

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## Generic Fracture Liaison Service Pathway

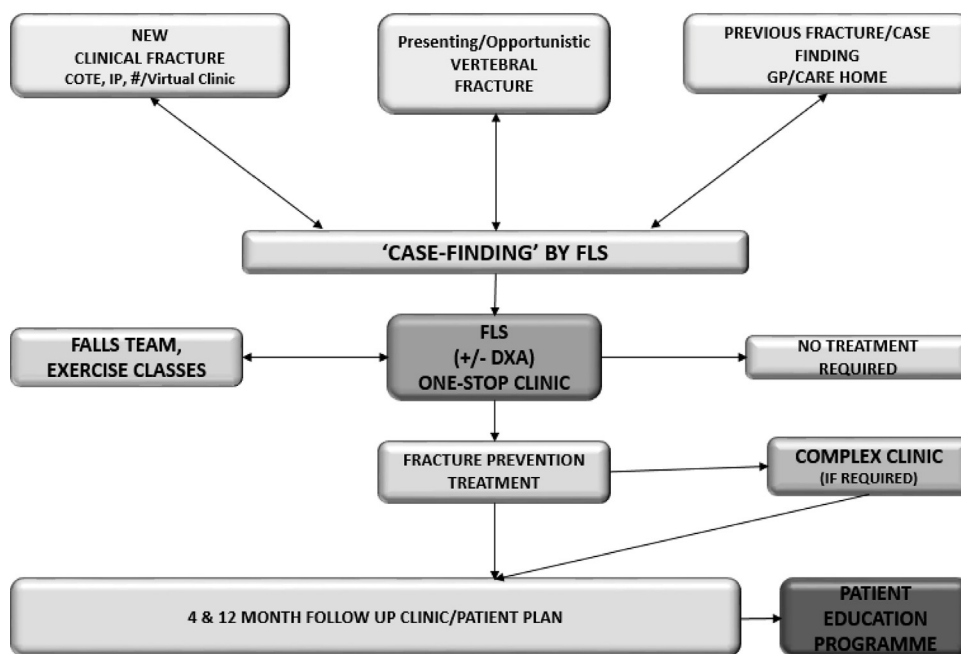


Fig. 1. Example of generic fracture liaison service; National Osteoporosis Society.

refracture rates by more than a third [4,5]. This review focuses on some of the lessons learnt when developing FLS to prevent fragility fractures.

### When to intervene: primary versus secondary prevention

Increasing bone fragility and frailty plus the accumulation of other factors including co-morbidities, polypharmacy and sarcopenia predispose towards injury in the form of fragility fractures [6–9]. Though primary prevention is appealing, and there is growing interest in screening for osteoporosis [10], the focus of this review is on secondary fracture prevention that identifies at risk individuals on the basis of them having sustained a new incident fragility fracture – as such, many services are co-located within fracture clinics, working alongside trauma teams as part of an integrated acute care and prevention team.

Almost half of patients presenting with a hip fracture have had a previous non-hip fragility fracture [11], suggesting that there is an opportunity to intervene with effective osteoporosis treatment in order to reduce the likelihood of an ensuing hip fracture. Those with an incident fragility fracture thus represent a high risk population where interventions such as bone active medical treatments (such as bisphosphonates) and falls interventions are justified [12]. Patients who are provided with appropriate contextualised advice and information at the time of the fracture are likely to be more amenable to commencing therapy to mitigate further fractures. Also, the ‘inconvenience’ of being immobilised during the treatment of the incident fracture may mean that patients are more likely to be receptive to interventions to reduce the likelihood of future events.

There are robust data for bisphosphonate prescribing in the setting of secondary fracture prevention with increasing cost effectiveness with increasing age and prior fracture [13]. This approach to secondary fracture prevention is supported by NICE, also recommending a multi-disciplinary hip fracture programme,

e.g. a FLS (see Fig. 1), due to their well-established success [14,15]. At the core of a FLS is a fracture prevention practitioner (FPP) who co-ordinates secondary fracture prevention interventions for an individual with the intention to standardise high quality care and facilitate communication between the patient and health and social care providers.

### How to intervene: the optimum model?

What is the optimal service model to reduce fragility fractures? Fracture prevention programmes have varied in design and structure but one trend has appeared, namely that a clinician (FPP) must have key responsibility for managing both fractures and falls risk in order to be maximally effective. Suggestive evidence for this is that simple dissemination of written education leaflets directed to the physician and/or patient (without a direct clinical interaction) has demonstrated no significant effects on refracture rates nor an increase in appropriate bone density scan (DXA) referrals [16]. A service that is limited to letters to primary care physicians to request prescribing results in low rates of bisphosphonate prescription [17]. With more sophisticated clinical interactions via FPPs, appropriate DXA referrals and bisphosphonate prescribing is increased in addition to more effective completion of a comprehensive falls risk and fracture assessment [18].

Although the majority of FLS are run within a secondary care environment, some community-based programmes operate, although attendance for subsequent DXA scanning appointments in these models may be as low as 45% [19]. By delegating responsibility for components of the FLS to non-specialised staff (for example GPs) without specific and designated resources, delay and variation in practice is introduced and efficacy may be compromised, as evidenced by failure of education-only programmes [14]. A meta-analysis examining the collaboration of orthopaedic teams with an orthogeriatrician has proven reduction

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