Commentary: The Five Ws of a Fracture Liaison Service:

WHY, WHO, WHAT, WHERE AND HOW?

In Osteoporosis, We Reap What We Sow

Curtis J, Silverman SL. *Curr Osteoporos*. 2013;11(4):1-5.

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ESTABLISHING A FRACTURE LIAISON SERVICE

OBJECTIVE:[1]

This article:

- Presents the why, who, what, where, and how of a Fracture Liaison Service (FLS)
- Demonstrates how FLS can be successfully implemented across multiple healthcare settings by addressing the inherent barriers these services face

BACKGROUND:[1-3]

A fragility fracture is a bone fracture due to weakened bone. Fractures due to osteoporosis are a concern due to their potential economic burden and negative impact on health. Currently, osteoporosis management after a fragility fracture is generally poor. For example, only a minority of the patients are being diagnosed and/or treated. An FLS is one example of a coordinated care model to identify, investigate, and intervene for a patient to help improve outcomes post fracture.

WHAT?[1]

An FLS is multidisciplinary team approach designed to reduce subsequent fractures in patients with a recent fragility fracture by identifying them at or proximate to the time they are treated at the hospital for fracture and providing them easier access to osteoporosis care.

WHY?[1]

Current osteoporosis management following fracture is generally poor. The potential benefits of incorporating an FLS are that it:

- Provides a systematic, effective approach to post-fracture care which can result in enhanced outcomes
- Improves medical care for the patient by reducing their risk of future fractures, which can result in cost-savings for the health care system
- Supports documentation of quality care delivery
- Helps reduce patient risk of subsequent fractures

WHO?[1]

An FLS team could include the following:

A **bone health champion**, typically a bone health expert (e.g., endocrinologist, rheumatologist, internist, physiatrist, orthopedist) and a physician within the health system, advocates for the FLS. The champion begins the FLS process, oversees the identification process, and tracks outcomes.

FLS providers support the patient throughout the process by ordering diagnostic tests, designing treatment plans per guidelines, and providing education and follow-up care.

Patients and their **caregivers**, when warranted, are provided education, diagnostic testing, treatment plans, and follow-up care through the FLS to help prevent future fractures.

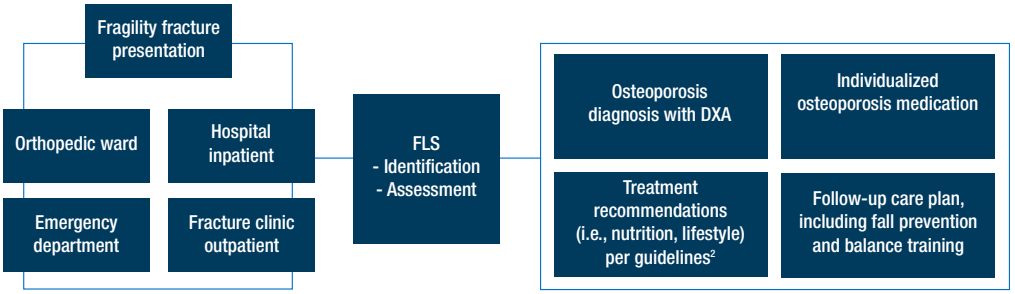
Since fragility fracture patients are present in multiple settings, **care coordination teams** are essential. Engagement and communication are vital among team members (e.g., orthopedic nurses, ED providers, internists, PCPs).

WHERE?[1]

Patients with a fragility fracture can present in the hospital, emergency department or clinic. Once identified and referred to the FLS, the process provides individualized assessment, diagnosis, and treatment to support bone health.

FLS requires initial resource inputs to be established but has the potential to yield appreciable public health impact to reduce the burden of fractures

THE FLS PROCESS[1]



Four critical steps usually occur in the FLS process:

1. Identification of patients with fragility fracture in hospital
2. Investigating/diagnosing patients with osteoporosis. Patients identified can be automatically referred for DXA via a standardized order set, or individually by the FLS provider
3. Individualize OP medication based on patient's medical history and insurance, and provide follow-up to ensure adherence to treatment
4. Providing patients and families with instruction. This can be done by the FLS provider, an orthopedic nurse, MD in osteoporosis or the patient's PCP. This includes follow-up care to ensure the patient's adherence to treatment

DXA=dual-energy x-ray absorptiometry; ED=emergency department; MD=medical doctor; OP=Osteoporosis; PCP=primary care provider.

FLS ELEMENTS FACE MANAGEABLE CHALLENGES

HOW?[1]

Several elements contribute to an FLS and often each element encounters challenges that can be managed.

FLS NEED	POTENTIAL BARRIER	OPTIONS TO ADDRESS
Identification of bone health champion	Gaining system interest and financial support for the FLS start up	Please refer to the publication for more details: Curtis J, Silverman S. *Curr Osteoporos Rep*. 2013; 11(4):1-4.
Identification of patients in multiple settings	– No one-size fits all strategy to identify patients across a variety of settings – Each setting has its own needs and requirements and buy-in is necessary from all stakeholders	
Diagnosis and management of osteoporosis	Changes based upon patient and care setting	
PCP support as FLS partner	PCPs may not understand the need for the FLS, feel it's interfering with his or her practice, or may dismiss osteoporosis and subsequently fragility fractures because of aging	
Coordinated care	Coordination is challenging due to the fragmented healthcare system and variety of settings post-fracture care is delivered and remote coordination of care (e.g., follow-up calls) is often ineffective	

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KEY POINTS:[1]

- Establishing an FLS to identify and manage patients with a recent fragility fracture has the potential to support patient outcomes and reduce costs
- A bone health champion advocates and initiates the process of identification, diagnosis, treatment plan, and follow-up care with the help of FLS providers
- An FLS is most effective when it can function across multiple healthcare settings
- The future of FLS care depends on a collaborative systems-based approach with appropriate stakeholder engagement, leading to seamless integration of osteoporosis care

References: 1. Curtis J, Silverman SL. Commentary: The Five Ws of a Fracture Liaison Service: Why, Who, What, Where and How? In Osteoporosis, We Reap What We Sow. *Curr Osteoporos.* 2013;11(4):1-5. **2.** Cosman F, deBeur SJ, LeBoff MS, et al. Clinician's Guide to Prevention and Treatment of Osteoporosis. *Osteoporos Int.* 2014; 25: 2359-2381. **3.** Looker AC, Sarafrazi Isfahani N, Fan B, Shepherd JA. FRAX-based estimates of 10-year probability of hip and major osteoporotic fracture among adults aged 40 and over: United States, 2013 and 2014. National health statistics reports; no 103. Hyattsville, MD: National Center for Health Statistics. 2017.

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Volume 11 | Issue 4 | December 2013
DOI: 10.1007/s11914-013-0177-9

Reprinted from:

Current Osteoporosis Reports

THE WHY AND HOW OF FRACTURE LIAISON SERVICES
(SL SILVERMAN, SECTION EDITOR)

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Springer

Curr Osteoporos Rep (2013) 11:365–368
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Published online: 9 October 2013

Abstract Establishing a Fracture Liaison Service (FLS) to identify and treat patients with a recent fragility fracture has been shown to be effective, save money, useful to document high quality of care, and makes good clinical sense. A FLS starts with an osteoporosis champion and encompasses identification of patients with a recent fracture, diagnostic workup, treatment, and follow-up. A FLS is most effective when it is able to function in multiple settings: the hospital, emergency department, and outpatient clinic. Implementation may be somewhat easier in a closed healthcare system but can be feasible even in an open system. There are many barriers to implementation which can be addressed. The future of FLS care lies in a collaborative systems-based approach with appropriate stakeholder engagement, leading to seamless integration of osteoporosis care.

Keywords Fracture Liaison Service · FLS · Osteoporosis management · Fracture · Risk · Fragility fracture

What is a Fracture Liaison Service?

A fracture liaison service (FLS) is a multidisciplinary system approach to reducing subsequent fracture risk in patients with a recent fragility fracture by identifying them at or proximate to the time they are treated at the hospital for fracture and providing them easy access to osteoporosis care.

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Why a FLS?

We know that current osteoporosis management following fracture is poor. Although treating patients with fragility fracture would seem to be "low lying fruit," we know that only a minority of patients are being diagnosed and/or treated. The Health Employer Data Information Set (HEDIS), an outcomes evaluation of managed care performance across many quality of care domains, tells us that about 23 % of patients 67 or older with fragility fracture are diagnosed or treated within 6 months of a fracture [1]. The potential benefits of a FLS are compelling, as follows:

It works. A system approach is needed since individual solutions have not worked. For example, neither patient nor provider education has increased diagnosis/treatment of osteoporosis. Similarly, many other interventions to improve rates of secondary prevention for fractures have been met with disappointing results [2, 3].

It saves money. A FLS improves medical care for the patient by reducing their risk of further fracture. This can result in cost-savings to a health care system. Both Kaiser-Permanente Southern California and Geisinger have shown cost savings [4, 5].

It documents high quality care as part of hospital accreditation efforts. A FLS helps hospitals meet new accreditation criteria proposed by The Joint Commission [6].

It's the right thing to do. Finally, a FLS simply makes good clinical sense as it helps our patients reduce their risk of subsequent fracture.

The Who, What and Where: Describing a FLS Program Across Healthcare Settings

The FLS process begins with the identification of a bone health champion, often a physician who approaches the administration of his/her health system or hospital with the benefits of a FLS. The physician is typically a bone health expert, such as an endocrinologist, rheumatologist, internist, physiatrist, or orthopedist. This champion is a key factor in helping set up a FLS, which typically involves the up-front cost of hiring a part- or full-time staff person, the FLS provider. This person is usually a nurse, nurse practitioner, or physician assistant.

The first step that the FLS needs to undertake is identification of patients with fragility fracture in the hospital, emergency department, or clinic. In hospital, the patient is often assigned to an orthopedic ward where the orthopedic nurses can help identify the patients with fragility fracture and refer them to the FLS. In the emergency department, patients with fragility fracture as defined by the fracture site and age (eg, wrist fracture above age 50) can receive specific discharge instructions, which refer them to the FLS (or to their primary care physician (PCP)) for osteoporosis (OP) evaluation. Patients evaluated exclusively in the outpatient setting, or in circumstances where real-time fracture identification in hospital is not feasible, may be identified by the FLS using a systems approach where health information technology (or even simple billing data) identifies all patients with fragility fractures based on international classification of disease (ICD-9) codes.

The second step is diagnosing osteoporosis. Patients identified can be automatically referred for dual energy x-ray absorptiometry (DXA) via a standardized order set, or individually by the FLS provider. Patients with hip fracture or vertebral fractures over age 50 can be assumed to have osteoporosis even without DXA. This information should be sent to the PCP, although initial responsibility for osteoporosis management remains with the FLS provider.

Once osteoporosis is diagnosed, patients and their families need instruction in the universal recommendations for osteoporosis care (NOF guidelines [7]). This can be done by the FLS provider, an orthopedic nurse, MD in a osteoporosis, or fracture prevention clinic, or the patient's PCP.

The next steps require individualizing osteoporosis medication based on the patient's medical history and insurance. Once a medication is chosen, follow-up is needed to assure adherence to treatment. Even if the FLS continues to follow patients longitudinally, the PCP needs to be part of the plan. Communication is needed at all steps.

How?

Barriers and Solutions

Each of the above elements that contributes to a FLS has an Achilles' heel that may derail implementation of a successful program.

The first essential element is the requirement for a local bone health champion who can initiate the process, oversee the implementation of an identification system to find fracture patients, and facilitate tracking outcomes via a database or similar registry. This individual could be a physician, a hospital manager, or an allied healthcare provider. Ideally, the best option is a partnership between several of these types of individuals. Having a healthcare provider part of a FLS program that can order labs and DXA testing and prescribe osteoporosis medications is helpful to make sure that the spectrum of osteoporosis care can be provided as part of the program rather than just a single component. The champion of the FLS then typically needs to obtain support for the FLS program, both to generate interest and consider how the up-front costs of setting up the FLS will be covered. In the U.K. a local audit of the hospital's current (and often poor) post-fracture osteoporosis care has been shown to motivate hospital administrators to increase attention on osteoporosis management and motivate interest in the FLS.

The next task for the FLS is in identifying fracture patients in multiple settings, ranging from an orthopedic wing, a medical wing where orthopedists are consultants to a hospitalist service, an emergency department, or a hospital-affiliated radiology practice that performs vertebroplasties or kyphoplasties. Each setting has specific needs and solutions, and there is no one-size-fits-all strategy about how best to do this. Moreover, each setting will require buy-in from all relevant stakeholders. In the ED, age and fracture-site specific orders are helpful so as to maximize the focus on older patients experiencing low-trauma fractures that are strongly suggestive of a fragility fracture. In the hospital, care can be standardized with order sets. In all settings, health information techology can produce lists of fracture patients based on ICD9 codes. However, this approach may best served in the role of a 'safety net' to prevent fracture patients from falling through the cracks and being missed by the more real-time processes of the FLS.

It is clear that FLS personnel need to provide a constant input of time, osteoporosis education, and reinforcement of the importance and facets of the program to engage providers who care for fracture patients. Staff turnover, clinicians who are not particularly interested in osteoporosis, teaching hospitals with residents and fellows on short-term rotations who are soon replaced by new residents, and providers who surgically repair the fracture but who disavow responsibility for what

happens after hospital discharge can be an impediment to progress.

Diagnosing and managing OP may vary depending on the patient and the care setting. For example, a patient with hip fracture may be too sick to be able to understand what is being recommended in the hospital with regard to osteoporosis management. However, at the time of a first outpatient follow-up visit (eg, 14 days after hospitalization) when sutures are removed, there is an opportunity to order a DXA and facilitate a consult with the FLS provider and/or a fracture prevention clinic. A skilled nursing facility, or home health care setting [8–10], might also be a teachable moment to provide osteoporosis-related education and care, especially under the direction of a FLS provider. Family members may need to be involved, but likewise may not understand how treatment of osteoporosis differs from treatment of the acute fracture. Some fracture patients may not be deemed appropriate for osteoporosis care by the FLS due to concomitant comorbidities (eg, patients with advanced dementia or with malignancies on hospice) [11]. However, these exceptions should be standardized if possible to prevent inappropriate variations in osteoporosis care being withheld by the FLS.

Among the biggest challenges in successfully implementing and sustaining a FLS is funding. Covering the salary of a FLS provider within a healthcare system is a frequent challenge, as the healthcare system usually receives a single payment provided under a global Diagnosis Related Group (DRG) for fracture repair. This bundled payment must encompass all services and disincentives all 'extra' care except that directly related to the fracture. Thus, osteoporosis management, receipt of DXA, and administration of osteoporosis therapies (including infrequently dosed parenteral treatments that might be more convenient to patients) are not reimbursed in hospital or skilled nursing facility (SNF) settings. How can this problem be overcome? At least for osteoporosis evaluation and management, coding modifiers may be used to separate this care from the global surgery payment. Some have attempted to justify the costs of FLS personnel costs in the form of downstream revenue to the health system from ancillary services (eg, DXA), but this alone is unlikely to be sufficient to yield cost neutrality of a FLS program, especially as DXA reimbursement has declined over time [12]. Payments to a hospital for providing high quality care and avoiding readmission penalties are other possibilities to help demonstrate to a hospital administrator that the return on investment in a FLS program in an open healthcare system is justified. In contrast, FLS programs in closed healthcare settings and in single payer healthcare systems have been shown to reduce costs [4, 5].

Why is there a disconnect between cost savings realized for open vs closed healthcare systems? The answer lies in who is realizing the cost savings—it is only the payer responsible for healthcare costs that reaps the benefits of cost savings from avoided fractures. Indeed, and although perhaps shortsighted, hospitals may complain that their revenues are at risk as a result of services not being rendered when fractures are avoided. For that reason, payers should be the primary motivator to directly support FLS programs. In the U.S. the largest payers expected to realize these cost savings are the Medicare program and affiliated Medicare managed care plans.

The PCP is a needed partner to a FLS, but PCPs can at times be a hindrance if he or she does not understand the FLS or feels that it is intrusive or unwelcome, dismisses osteoporosis as simply a consequence of old age, or sees a fragility fracture as an unavoidable result of a fall. Ongoing education to PCPs by the FLS is crucial, as is communication with the PCP at key transitions of care. Incentivizing providers and healthcare systems and larger entities like accountable care organizations may provide additional impetus to more effectively coordinate care.

A further challenge in care coordination for older patients with recent fractures relates to the multiplicity of settings in which post-fracture care is delivered. Coordination of care remotely (eg, follow-up telephone calls) is often impractical and inefficient. Thus, engaging patients in person across the various settings in which they receive post-fracture care (eg, nursing home, home health, and via ambulatory visits) and involving family members whenever possible likely will yield better outcomes but is often challenging in a fragmented healthcare system.

The Future

The future of FLS care lies in a coordinated strategy based on a seamless integration of care. The FLS program must establish a systematic approach to quickly identify fracture patients to appropriate health care providers (eg, FLS provider) who is primarily focused on managing osteoporosis. This person would direct patients to receive diagnostic testing with DXA, shepherd longitudinal osteoporosis management including implementing universal osteoporosis recommendations (eg, nutritional, lifestyle), initiate prescription medications and engage services to help with fall prevention and balance training.

Despite the benefits that FLS programs have been shown to achieve, they require an initial and sometimes ongoing input of resources in the form of salary support for FLS personnel. In addition, the activation energy required to overcome clinical inertia to start any new program seeking to improve quality of healthcare must also be considered. Ultimately, these investments have been shown to yield downstream cost savings, but one cannot invest resources that are not available. Indeed, it is sobering to realize that even in the U.K. where

dramatic cost costs from a FLS have been demonstrated, still only one-half of localities have implemented a FLS [13]. Much like a farmer who must make an initial investment of time and seed during planting season in order to later reap a harvest, a FLS requires initial resource inputs to set up. These investments have the potential to yield appreciable public health impact to reduce the burden of fractures.

Compliance with Ethics Guidelines

Conflict of Interest J Curtis declares that he has no conflicts of interest. SL Silverman declares that he has no conflicts of interest.

Human and Animal Rights and Informed Consent This article does not contain any studies with human or animal subjects performed by any of the authors.

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