FRATTURE DA FRAGILITA': DIAGNOSI, TERAPIA E CONTINUITA' ASSISTENZIALE

Il ruolo del Fracture Liaison Service

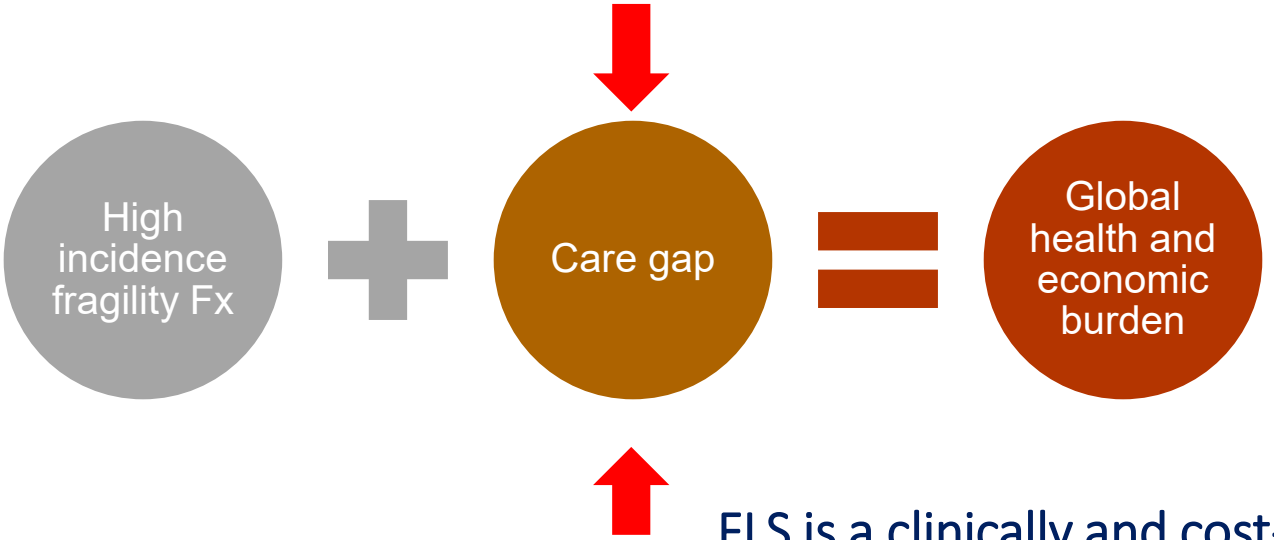
Prof.ssa Carmelinda Ruggiero
Gerontology and Geriatric Section
Department of Medicine and Surgery
Orthogeriatric Unit - Geriatric Acute Care Unit
University of Perugia Medical Faculty

Outline

- FLS to close the care gap in secondary prevention of fragility fractures
  - main features and scope

- Tips to setting up and FLS
  - what does it takes? methodology and resources

Why Fracture Liaison Service?



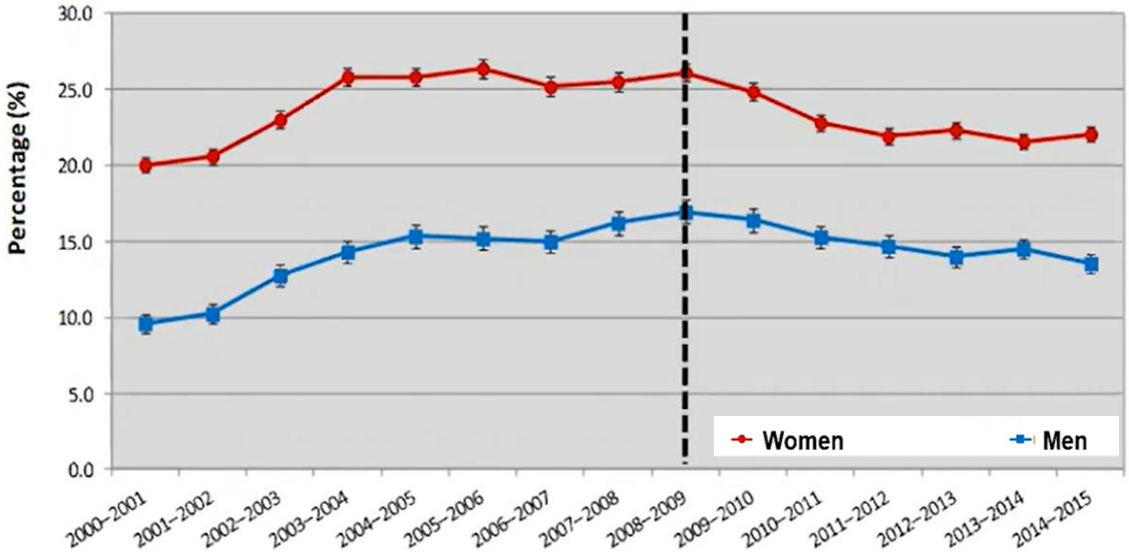
FLS is a clinically and cost-effective model of care

for secondary prevention

if we do it rigth!

SCOPE '21
ScoreCard for OsteoPorosis in Europe

Percentage of individuals who received OP medication 1 year following major fracture in Canada, 2000- 2015



Care Gap

73.9% in women

83.1% in men

Up to 26.1% in Women and 16.9% in Men
Increase up to 2008-2009 (p fro trend <0001)
Followed by decline to 2014- 2015 (p for trend <.0001)

Failure of the **non-target interventions that** try to change patients outcomes without conneting with the patients (i.e. education, protocols, guidelines, etc).

Time to reframe osteoporosis: a position statement to characterize the osteoporosis care gap

Zoe Paskins[1,*], Laurna Bullock[1], Ashley Hawarden[1], Fiona Blackman[2], David J. Armstrong[3], Ida Bentley[4], Emma M. Clark[5], Robin M. Daly[6], Deborah David[7], Valerie Farr[8], Dan Flower[4], Celia L. Gregson[5], Jill Griffin[9], Barbara Hauser[10], Muhammad Kassim Javaid[11], Clare Jinks[1], Rose Jones[1], Chelsea Kettle[1], Emily Lam[4], Sarah Leyland[12], Janice McKinley[8], Elaine Nicholls[13], Terence W. O'Neill[14,15,16], Terence Ong Ing Wei[17], Opinder Sahota[18], Ken Poole[19,20], Stuart Ralston[21], Carmelinda Ruggiero[22], Kanta Sandhu[4], Caroline Sangan[12], Corinne Turnbull[8], Nic Vine[8]

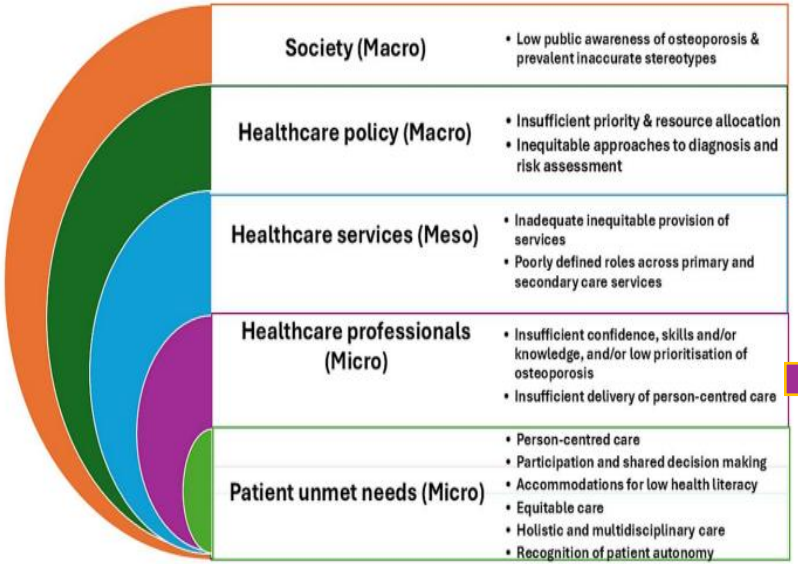


Figure 1 Osteoporosis care gap problem description.

Components of osteoporosis healthcare

Case finding	• Primary and secondary fracture prevention identification of adult patients based on risk of fracture and osteoporosis and not access to healthcare • Identification of those with low or no trauma osteoporotic fractures, particularly spinal and other major osteoporotic fractures
Osteoporosis and fracture risk assessment	• Appropriate timely risk assessment based on comprehensive approach to identify diseases and drugs affecting bone health and investigations including bone density scans where needed and available • Impact of fracture(s) • Information needs
Treatment options and information	• Fracture risk reduction strategies, including: ▪ Pharmacological treatments personalized to patient's fracture risk ▪ Lifestyle changes including diet and exercise which promote bone health and reduce falls risk ▪ Reducing falls risk ▪ Identification and treatment of secondary causes of osteoporosis • Management of patient needs relating to fracture symptoms and recovery, including: ▪ Quality of life ▪ Pain, physical, and psychological function ▪ Ability to undertake self-care and activities of daily living ▪ Emotional and spiritual needs ▪ Social participation, education, and employment • Tailored patient education and information, which is accessible, understandable, useable and ▪ Clearly trustworthy and evidence based ▪ Addresses individual information needs, expectations, and goals ▪ Clearly explains osteoporosis and its treatments ▪ Advises on fracture symptom management ▪ Explains what to expect from healthcare services ▪ Supports self-management ▪ Supports shared and informed decision-making ▪ Supports patients to ask questions
Review	• Medicines optimization[a] • Non-pharmacological treatment review (eg, exercise, nutrition) • Monitoring of the condition, including re-review of falls and fracture risk • Review and address fracture impacts, as outlined above • Elicit and address information needs for individuals, their family and caregivers • Onward referral as needed (specialist, occupational therapy, physiotherapy, falls)

How does Fracture Liaison Service work?

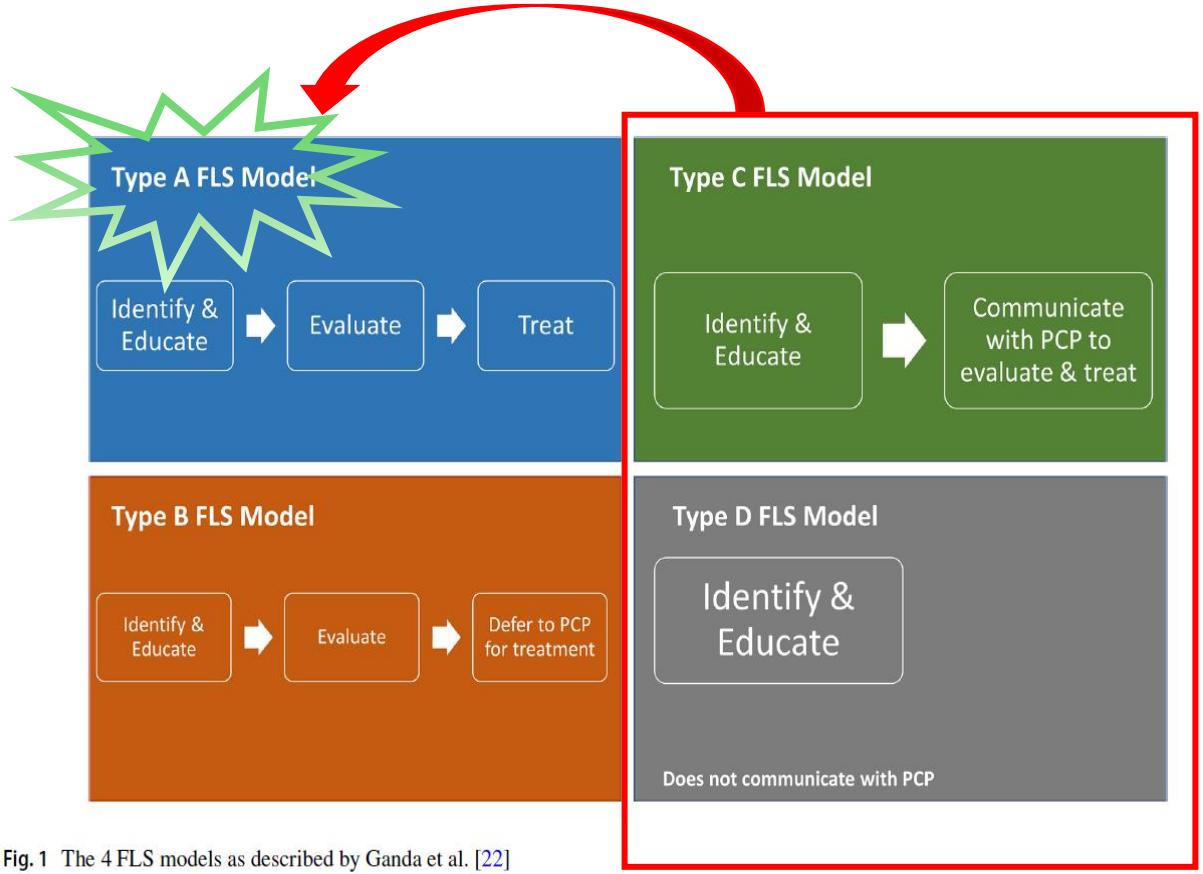
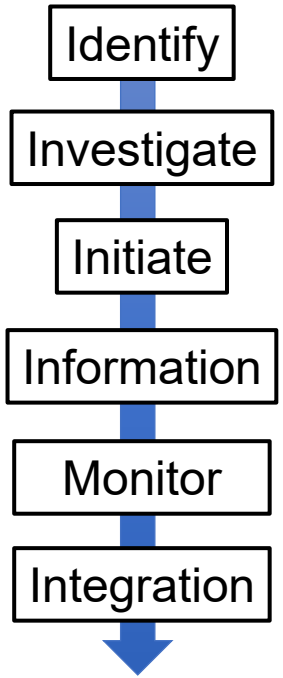


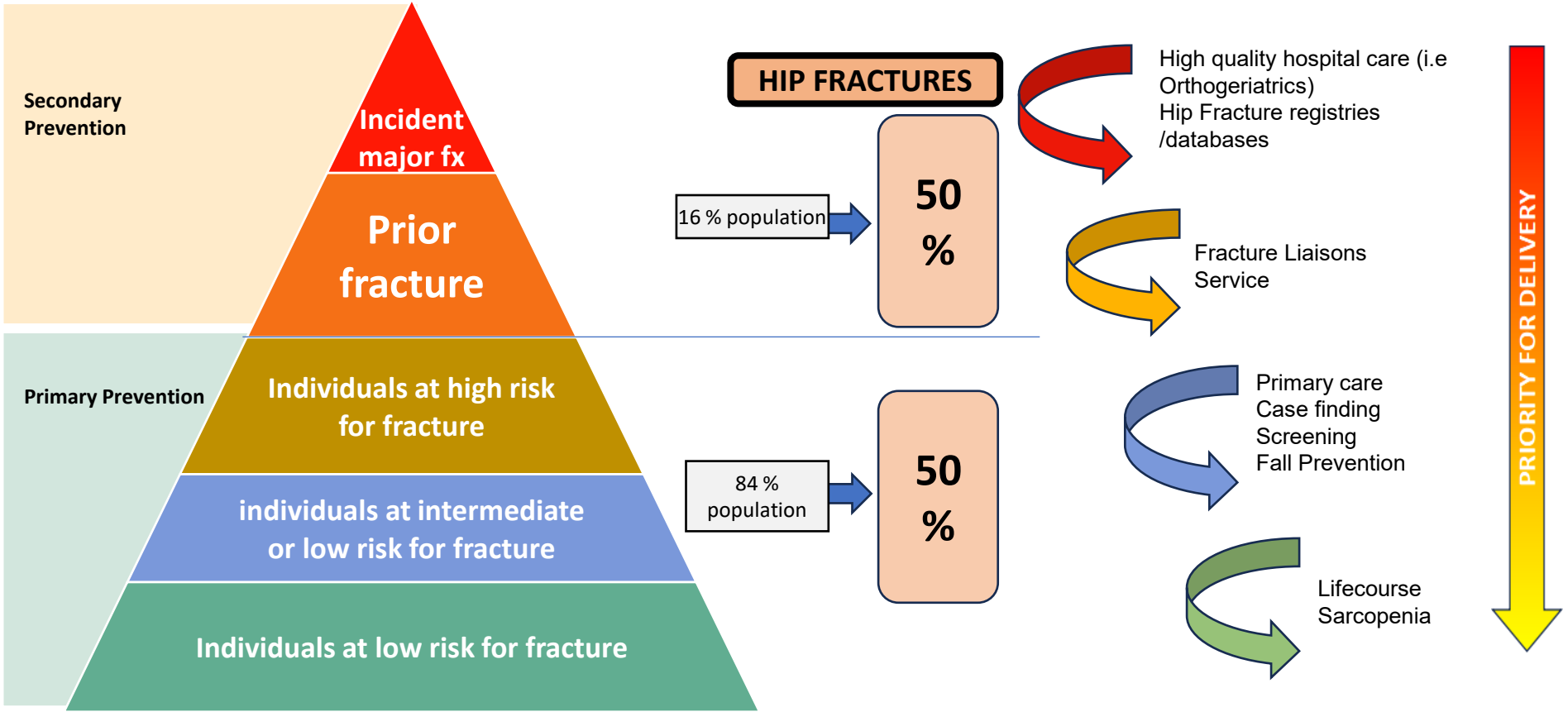
Fig. 1 The 4 FLS models as described by Ganda et al. [22]

6i Targeted Interventions



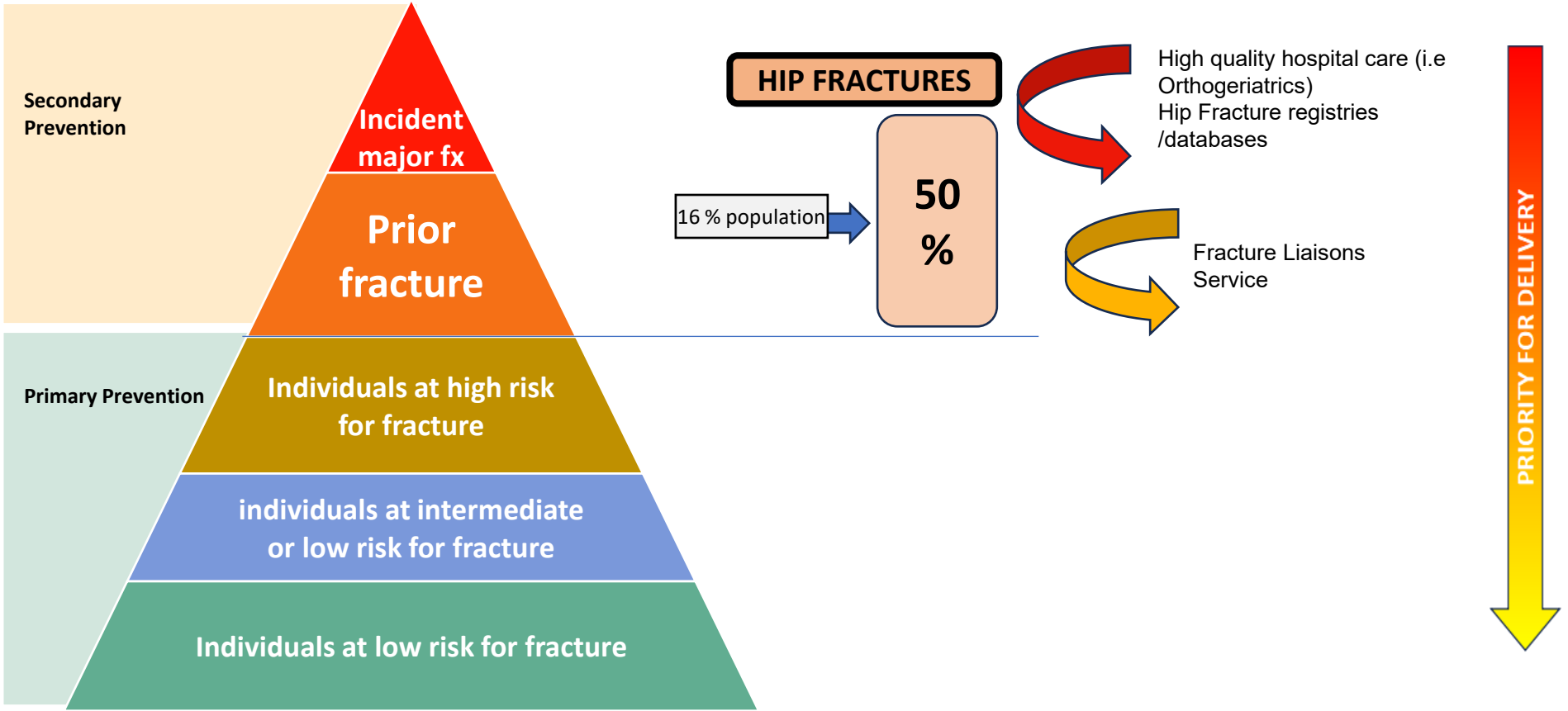
modified from Hal V.Le et al, Arch Osteop 2024; Javaid MK, et al, Osteoporosi Int 2020; Akesson K, et al, Osteop Int 2022

FLS starts where the patient is



Modified from Department of Health Prevention Package for Older People: Falls and Fractures – Effective interventions in health and social care, 2009

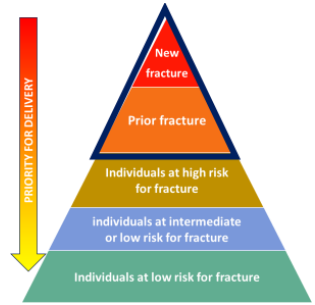
FLS starts where the patient is

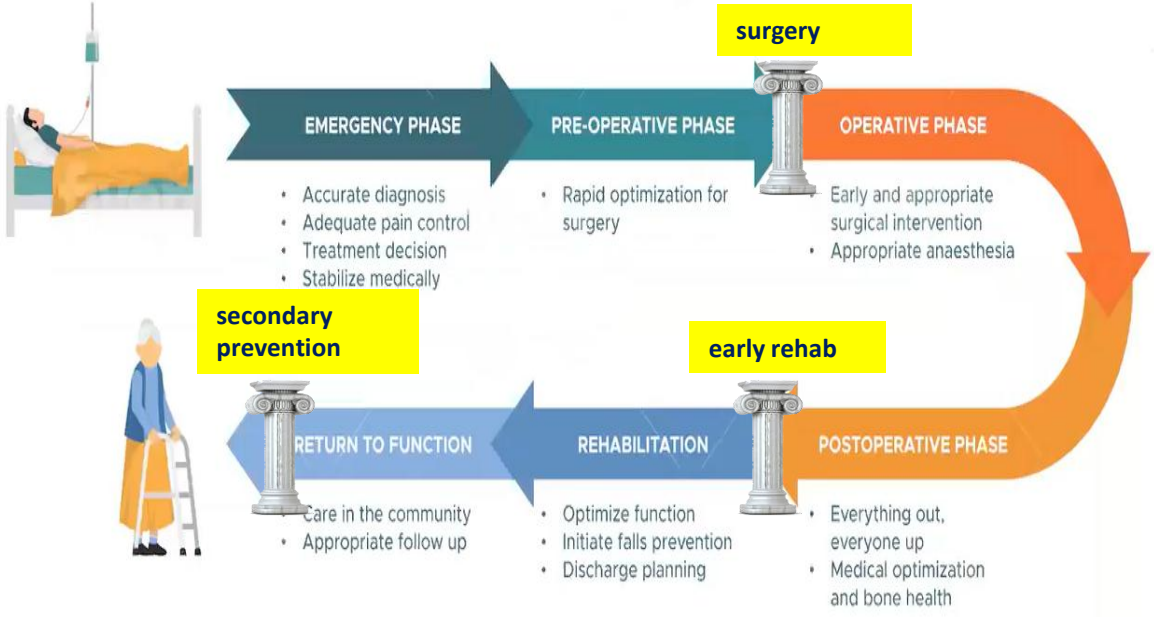


Modified from Department of Health Prevention Package for Older People: Falls and Fractures – Effective interventions in health and social care, 2009

How facing the problem?

orthogeriatrics is patient-centered care model





Orthogeriatric care manages the fracture and treats the whole person using **pathways maximizimg the quality of care** whatever resources are available.

Support measurement of care: process and outcome indicators reccommended for <u>in hospital care, discharge to the community and fracture liaison services</u>

The Fracture Phenotypes in Women and Men of 50 Years and Older with a Recent Clinical Fracture

P. Geusens[1,2] · J. van den Bergh[1,3] · C. Roux[4] · R. Chapurlat[5] · J. Center[6] · D. Bliuc[6] · C. Wyers[7,8] · M. K. Javaid[9] · N. Li[10]
D. Whittier[11] · W. F. Lems[12,13]

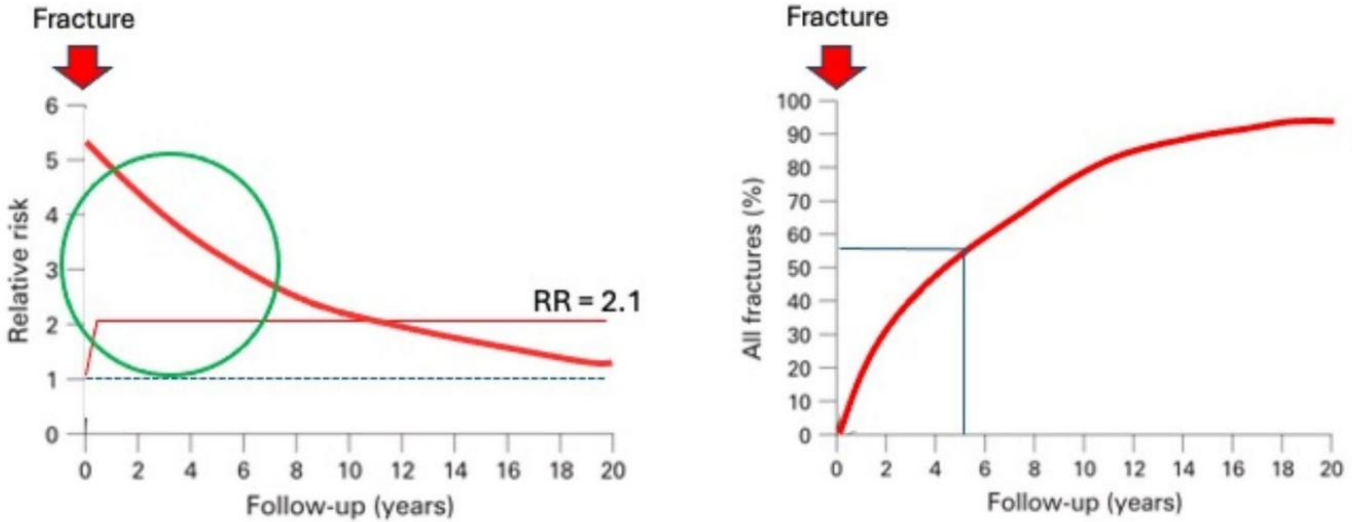


Fig. 1 Left panel: the relative risk (RR) of subsequent clinical fractures is doubled over the long term (fine red line). It is highest in the first years after a clinical fracture (bold red line circled in green) and decreases over time but remains increased at long term. Right panel: cumulative incidence of subsequent clinical fractures as percentage of all subsequent clinical fractures for 20 years follow-up. More than 50% of all subsequent clinical fractures occurred during the first five years. (adapted from van Geel *et all*.) [19].

Geusens P, Current Osteoporosis Reports, 2024

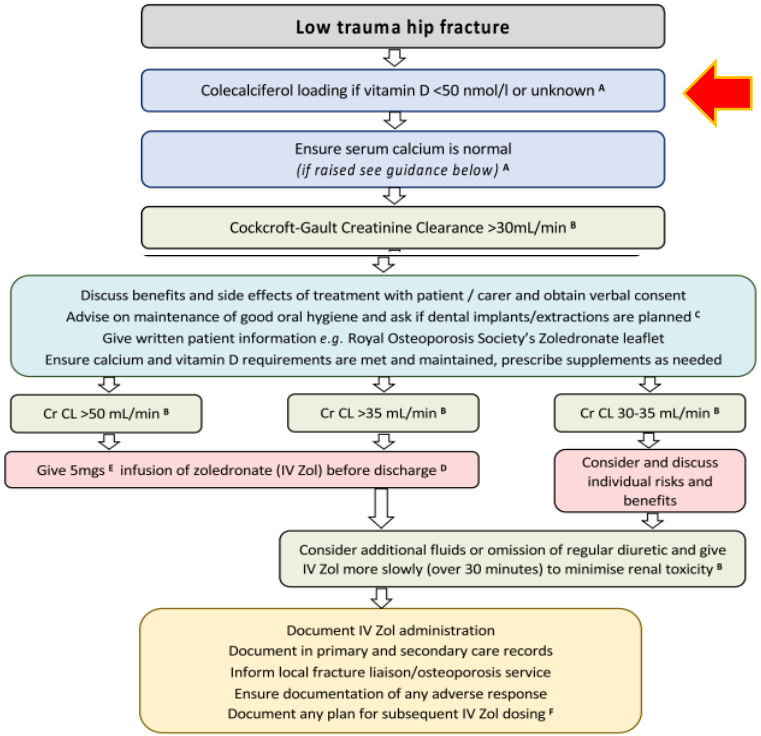
1. Secondary Prevention starts hospital admission

A single dos
shown to be
Hence, a loa
in ‘split’ dos

AOPg protocol
- a) Colecalciferol
  - 300.000
- b) Colecalcit
  - 300.0

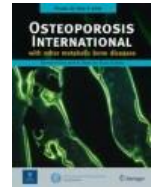
Call to action: a five nations consensus on the use of intravenous zoledronate after hip fracture

Antony Johansen[1,2], Opinder Sahota[3], Frances Dockery[4], Alison J. Black[5], Alasdair M.J. MacLullich[6,7], M. Kassim Javaid[2,8], Emer Ahern[9,10,11], Celia L. Gregson[12,13]



Preliminary data from Orthogeriatric Unit AOPg

Post-fracture care programs for prevention of subsequent fragility fractures: a literature assessment of current trends



K.E. Åkesson[1,2] · K. Ganda[3,4] · C. Deignan[5] · M.K. Oates[5] · A. Volpert[6] · K. Brooks[7] · D. Lee[8,9] · D.R. Dirschl[10] · A.J. Singer[11]

2022

Orthogeriatric Service

Primary goal: improve overall patient's outcomes (morbidity/mortality/ physical function)

Combination

Fracture Liaison Service

Primary goal: **prevent subsequent fragility fractures**

UNIVERSITÀ DEGLI STUDI DI PERUGIA
DIPARTIMENTO DI MEDICINA E CHIRURGIA
***Sezione* GERONTOLOGIA E GERIATRIA**
AZIENDA OSPEDALIERA DI PERUGIA
S.C. GERIATRIA
Direttore: Prof.ssa Patrizia Mecocci
S.S. ORTOGERIATRIA
Responsabile: Prof.ssa Carmelinda Ruggiero
Servizio di Valutazione del Rischio di Caduta e di Frattura nell'Anziano

Improvement in osteoporosis detection in a fracture liaison service with integration of a geriatric hip fracture care program

Implementation of a fracture liaison service for patients with hip fracture cared for on a hospital medicine service

John R. Stephens , Donald Caraccio , Dana R Mabry , Kelly V. Stepanek , Morgan S. Jones , David F. Hemsey & Carlton R. Moore

Orthogeriatric pathway: focus on patient' needs

Hospitalised hip fracture (n=762; 100%)

→ **Orthogeriatric unit (≈7.5 days hospitalised)**

- **Identification** (100% HF inpatients)
- **Investigation** (lab exams, **CGA**)
- **Initiation** (vitamin D and calcium [100%], AOT [10%] at discharge)

↓

Patients returning for mandatory 40-day post-surgical visit (n=540; 70%)

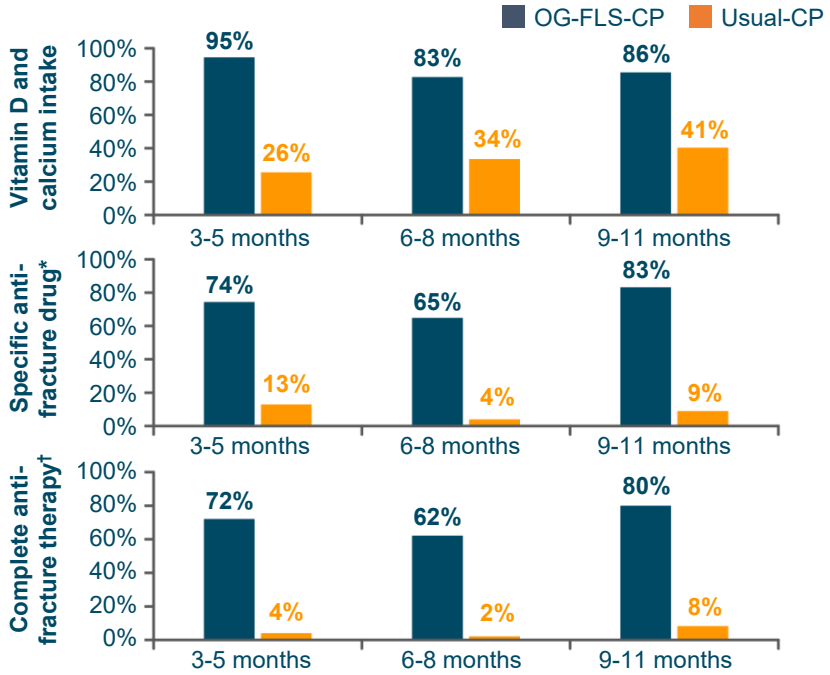
- **Usual approach (≈40 days from surgery) (n=272)**
  - → Receive indication to reach the FLS
- **Orthogeriatric out-patient service (≈40 days from surgery) (n=268)**
  - → Pharmacological & non-pharmacological interventions
  - → Falls & fracture prevention intervention
  - → Caregiver education
  - → General practitioners

- Post-discharge hip X-ray, surgical and clinical assessment and drug review **based on CGA**
- Laboratory evaluation if needed
- DXA
- Radiologic evaluation (where indicated)
- Fall risk assessment and functional recovery
- **Follow-up scheduled at 6 or 12 months**

Ruggiero C et al, Arch Osteop 2022

Orthogeriatric pathway: approaching threshold for value

Patient adherence to treatment[1]



The OG-FLS Care Programme works!

- 72% initiated complete anti-fracture treatment within 3 months[1]
- **80% were adherent to complete anti-fracture treatment at 9 months[1]**

Treated: 48%[2] → 80%[1]

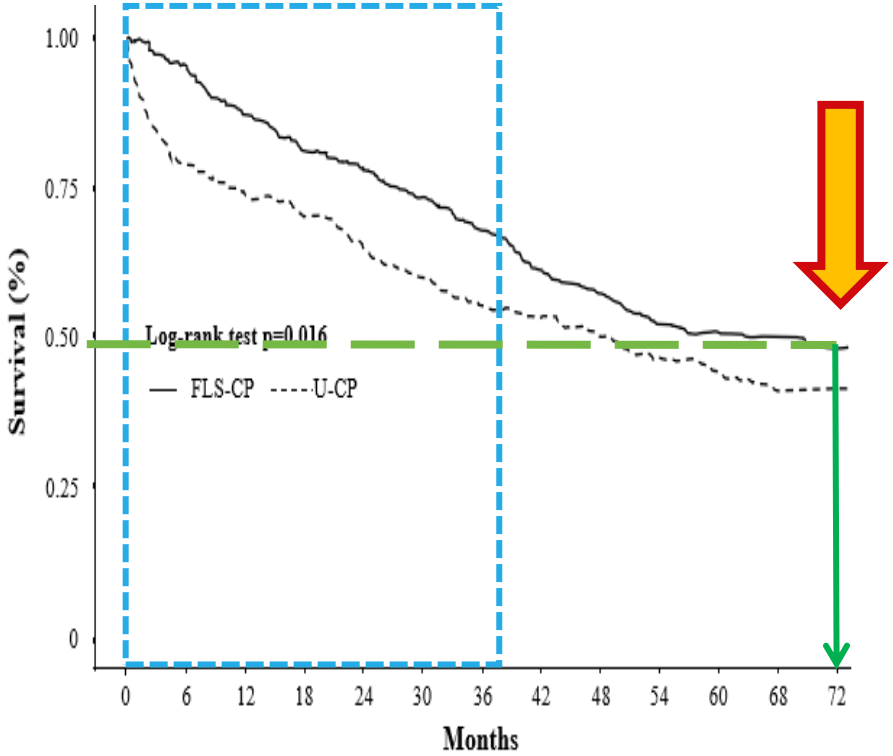
Eligible: n=248

Main limitations: this was not a systematic approach for all eligible patients since we did not have evidence, at that time, to set up the OG-OS in the real clinical world. It was a sort of **pragmatic randomised approach based on patients' and caregivers' preference**!

Ruggiero C et al, Arch Osteop 2022

The interdisciplinary Fracture Liaison Service improves health-related outcomes and survival of older adults after hip fracture surgical repair

Ruggiero C*[1], Baroni M[1], Talesa GR[2], Cirimbilli A[2], Prenni V[1], Bubba V[1], Parretti L[1], Bogini R[3], Duranti G[3], Caraffa A[2], Boccardi V[1], Mecocci P[1], Rinonapoli G[2]



	FLS-CP	U-CP	FLS vs U-CP (95% CI)	p-value
Falls (number)	31.1 (20.8; 44.6)	24.4 (16.7; 34.5)	RR = 1.021 (0.607; 1.717)	0.9366
- Multiple fallers (% patients)	19% (6.3; 42.6)	34.8% (17.2;57.2)	OR=0.057 (0.004; 0.876)	0.0399
Fractures	5.4 (1.7; 12.5)	6.9 (3.1; 13.0)	RR = 0.783 (0.261; 2.353)	0.6640
Health facility admissions*	40.7 (28.8; 55.9)	58.0 (45.7; 72.6)	RR = 0.597 (0.398; 0.895)	0.0125
HFS (days)	176.4 (89; 263)	88.7 (49.2; 128.2)	Δ = 85.8 (23.9; 147.7)	0.0152

Ruggiero C et al, Arch Osteop 2022

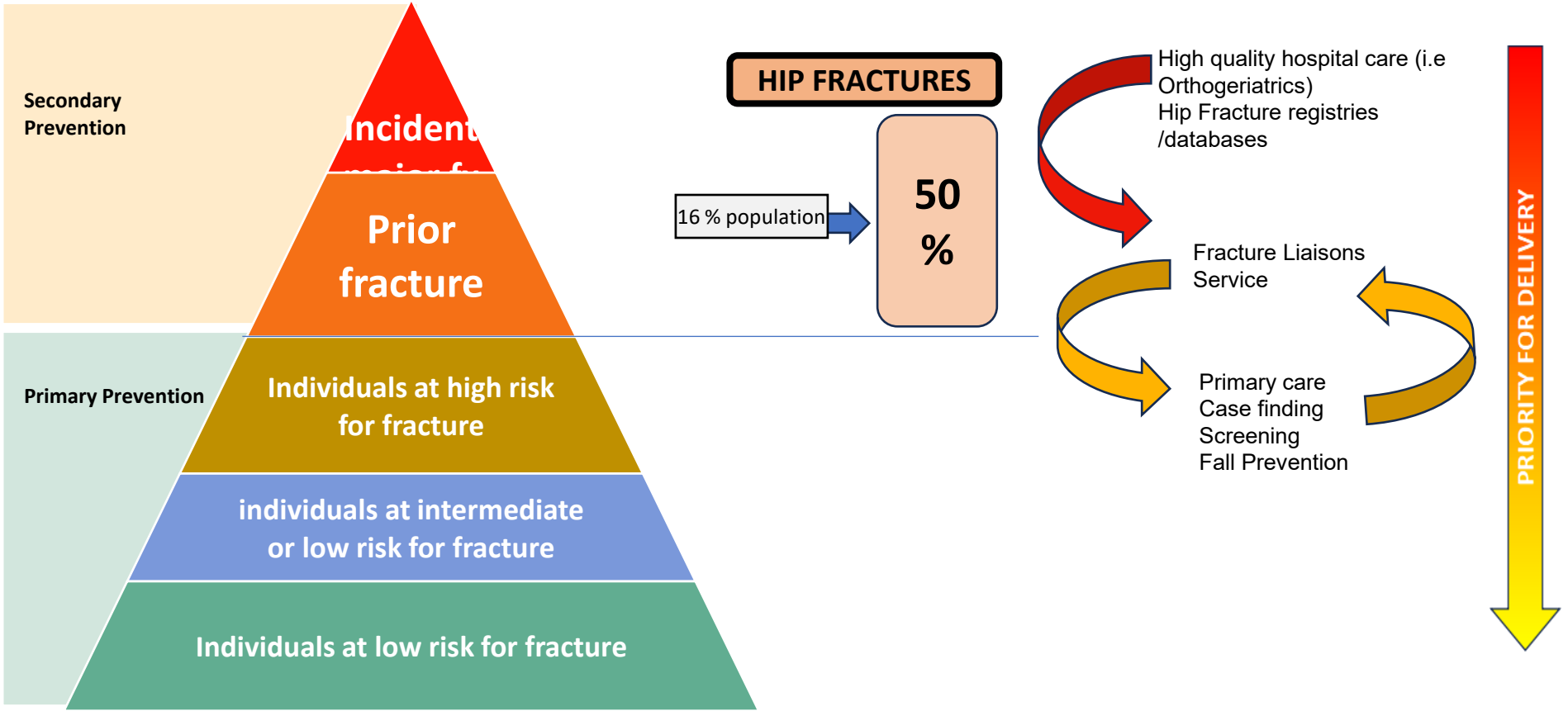
Orthogeriatric: predict and personalize care

Pre-fracture functional status and early recovery are main predictors of 5-year survival in pts with hip fractures

Model 1 (at admission)	B (SE)	P-value	HR (95% CI)
Gender			
Female (reference)			0
Male	0.610 (0.222)	0.006	1.840 (1.192–2.841)
Age	0.068 (0.016)	<0.0001	**1.070 (1.037–1.105)**
Pre-fracture BADL independence	−0.298 (0.054)	<0.0001	**0.742 (0.668–0.825)**
Chronic diseases, number	0.092 (0.043)	0.033	1.096 (1.007–1.193)

Ruggiero C et al, Osteop Int 2024

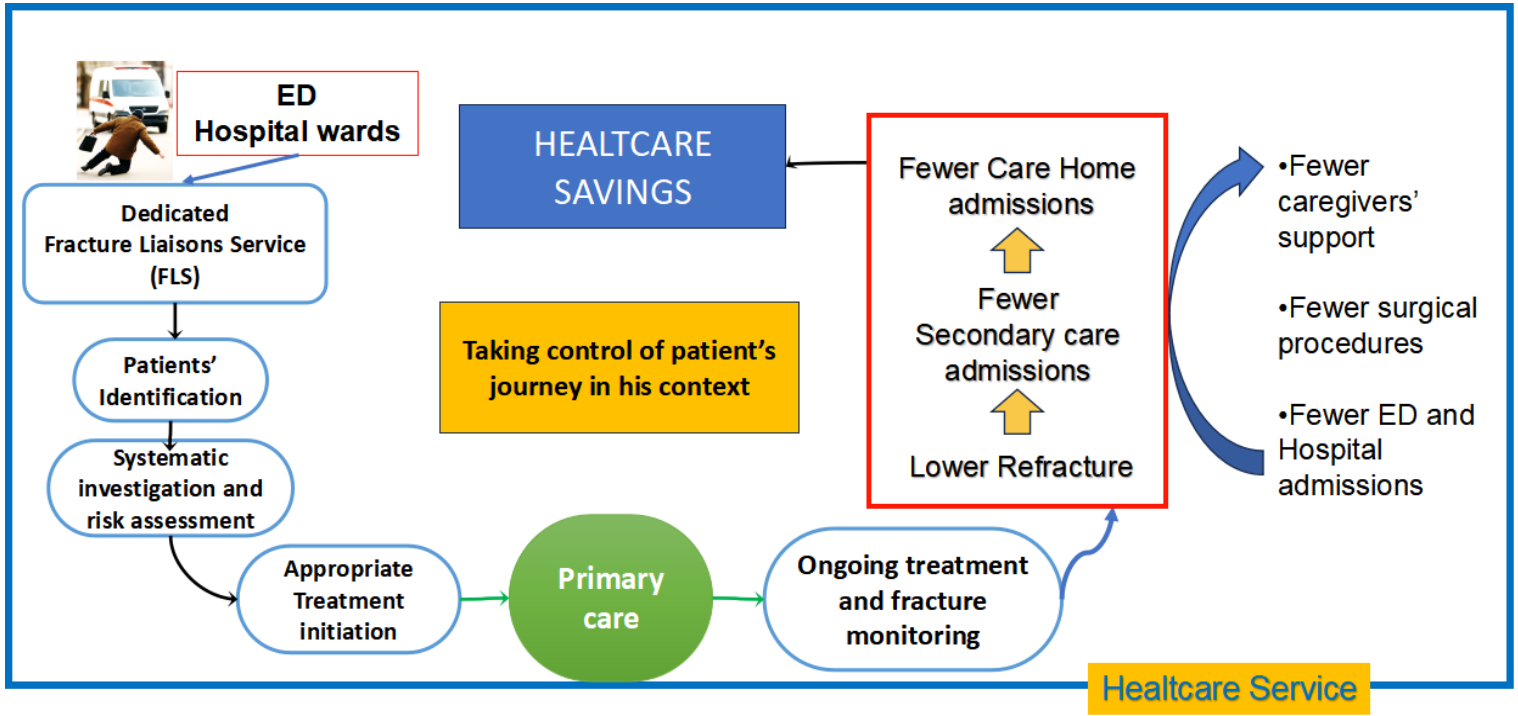
FLS starts where the patient is



Modified from Department of Health Prevention Package for Older People: Falls and Fractures – Effective interventions in health and social care, 2009

Fracture Liaison Service

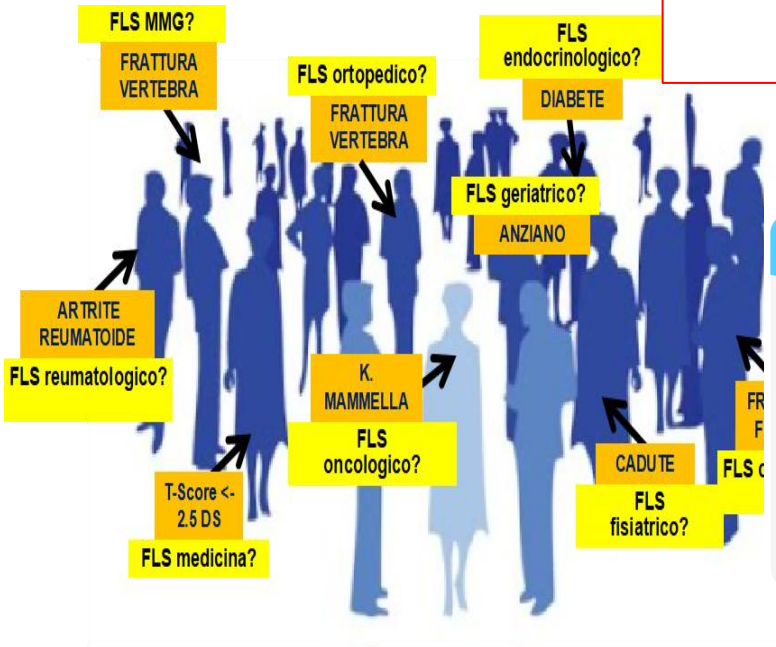
1. Patient-Centered - Transmural- Multiprofessional and Coordinated care model usually hospital-based



Grignaschi S, Ruggiero C et al, under press; Javaid MK, et al, Osteoporosi Int 2020; Akesson K, et al, Osteop Int 2022

Fracture Liaison Service

1. **Patient-Centered** - **Transmural**- **Multiprofessional** and Coordinated care model usually hospital-based



Depending on patients' setting, post-fracture programs should be adapted while retaining consistent KPIs

Pazienti con frattura chirurgica maggiore

Tipologia di pazienti:
pazienti che accedono in PS con frattura da fragilità maggiore che necessitano di intervento chirurgico

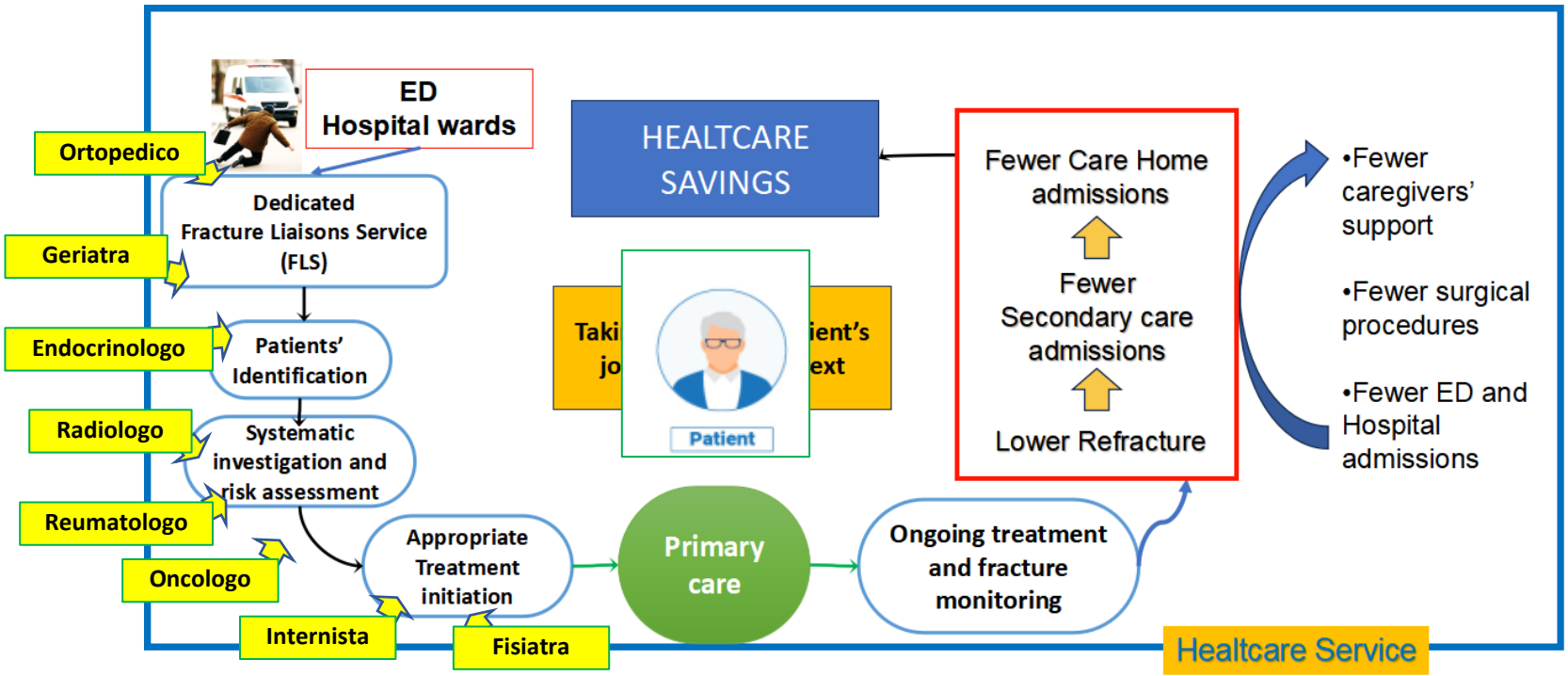
Elementi chiave del percorso:
- Triage ed accertamenti ematochimici e radiologici in PS; invio fratturati al PS ortopedico e fratturati di vertebra in neurochirurgia
- ricovero ed intervento chirurgico presso il reparto di Ortogeriatria
- contestuale inserimento del paziente nel percorso FLS integrato tra Ortopedia e Geriatria

Punti di attenzione:
Percorso strutturato di presa in carico Ortogeriatrico dedicato alle fratture di femore e maggiori, ma non alle fratture vertebrali e minori

Key Performance Indicators	Jan -2024	Rate	Apr -2024	Rate
1. Patient Identification	Y	70%	Y	?%
2. Patient Management drive by CGA	N	%	N	%
3. Patient Surgery<48h	Y	60%	Y	60%
4. Early weight-bearing	N	%	N	%
5. Short & long-term Functional Recovery	N	%	N	%
6. Falls and Fracture Prevention	Y	30%	Y	30%
7. Medication Review and Initiation	N	%	N	%
8. Post-Surgical Assessment & Management	Y	50%	Y	50%
9. Communication Strategy	N	%	N	%
10. Assessment Guidelines (X-ray; DXA)	Y	25%	Y	25%
11. Vertebral Fracture Identification	Y	25%	Y	25%
12. Long-term Management & Persistence	N	%	N	%
13. Re-fractures	N	%	Y	?%
14. PROMS	N	%	N	%
15. Database	N	%	N	%
16. Audit	N	%	N	%

Fracture Liaison Service

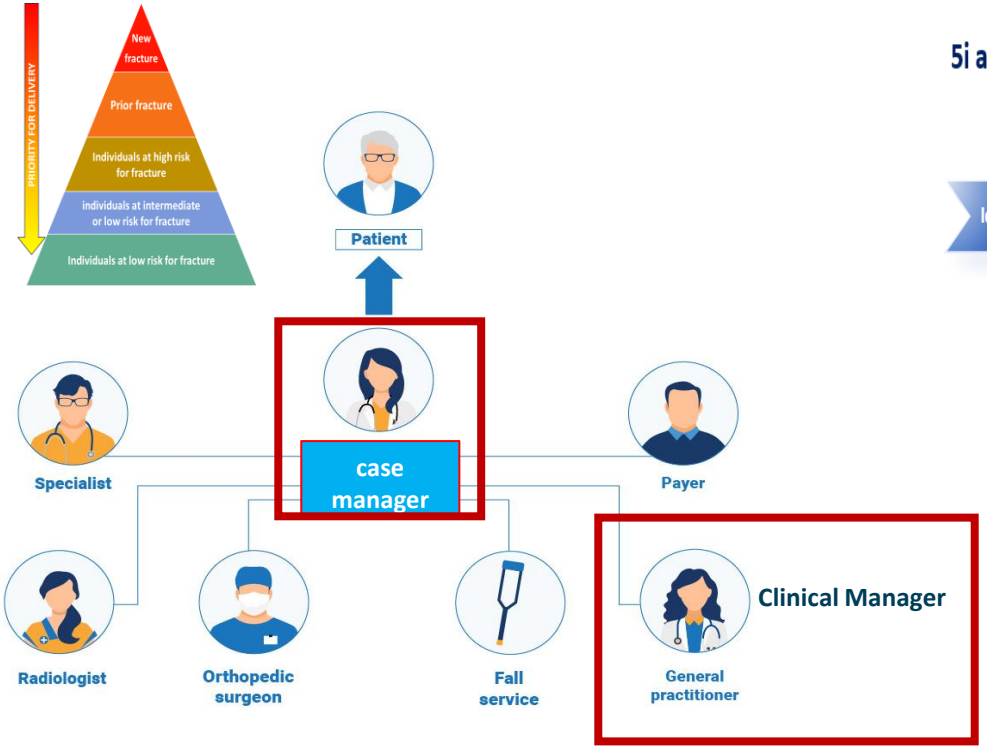
1. Patient-Centered - Transmural- Multiprofessional and Coordinated care model usually hospital-based



Javaid MK, et al, Osteoporosi Int 2020; Akesson K, et al, Osteop Int 2022

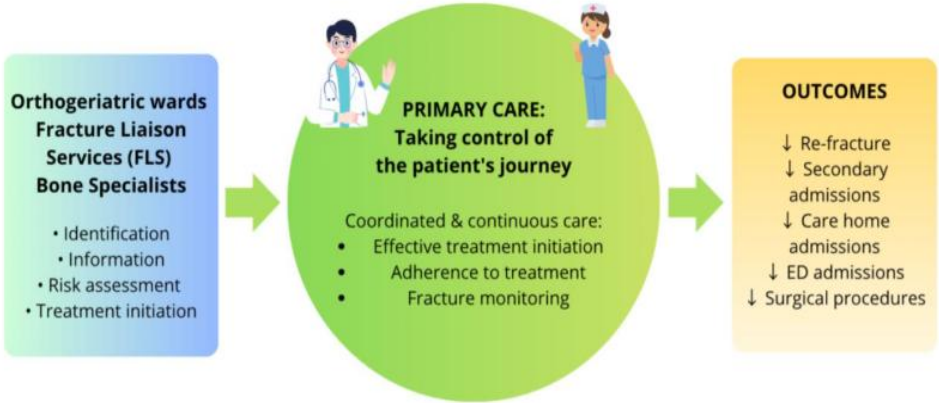
Fracture Liaison Service e Casa della Comunità

Patient-Centered - **Transmural**- **Multiprofessional** and **Coordinated** care model usually hospital-based and **transitioning to home**



Fracture Liaison Service: state of the art

1. Coordinated -Transmural- Multiprofessional care model usually hospital-based and **strongly connected with community**



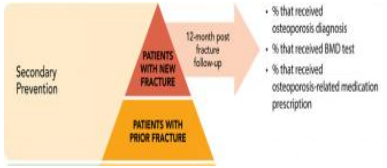
2. Designed to provide Systematic case-finding and initiation to the most appropriate treatments patients **aged 50 and over** at risk of fragility fracture

3. Aimed to reduce the burden of subsequent falls and fractures at individual and HC level **starting from those at the highest risk**

Grignaschi S, Ruggiero C et al, under press 2026

The 2024 UK clinical guideline for the prevention and treatment of osteoporosis

Celia L. Gregson[1,2] · David J. Armstrong[3] · Christina Avgerinou[4,5] · Jean Bowden[25] · Cyrus Cooper[6,7,8] · Lucy Douglas[9,10] · John Edwards[11,12] · Neil J. L. Gittoes[13] · Nicholas C. Harvey[6,7] · John A. Kanis[14] · Sarah Leyland[15] · Rebecca Low[16,17] · Eugene McCloskey[18] · Katie Moss[19] · Jane Parker[26] · Zoe Paskins[20] · Kenneth Poole[21] · David M. Reid[22] · Mike Stone[23] · Julia Tomson[15] · Nic Vine[27] · Juliet Compston[24] · National Osteoporosis Guideline Group (NOGG)

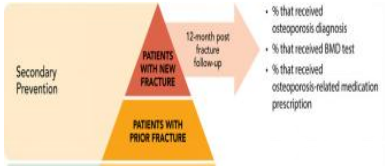


The guideline is intended for all healthcare professionals involved in the prevention and treatment of osteoporosis and fragility fractures, *including* ***primary care practitioners*** *and relevant specialists in secondary care* including rheumatologists, gerontologists, gynaecologists, endocrinologists, and orthopaedic surgeons.....***Primary care physicians should have sufficient training in this area with efficient access to up-to-date evidence-based resources and guidelines, and continual professional development (CPD) opportunities*** (Strong recommendation).

1. Pharmacological treatment options
2. Falls interventions
3. Screening and case finding

The 2024 UK clinical guideline for the prevention and treatment of osteoporosis

Celia L. Gregson[1,2] · David J. Armstrong[3] · Christina Avgerinou[4,5] · Jean Bowden[25] · Cyrus Cooper[6,7,8] · Lucy Douglas[9,10] · John Edwards[11,12] · Neil J. L. Gittoes[13] · Nicholas C. Harvey[6,7] · John A. Kanis[14] · Sarah Leyland[15] · Rebecca Low[16,17] · Eugene McCloskey[18] · Katie Moss[19] · Jane Parker[26] · Zoe Paskins[20] · Kenneth Poole[21] · David M. Reid[22] · Mike Stone[23] · Julia Tomson[15] · Nic Vine[27] · Juliet Compston[24] · National Osteoporosis Guideline Group (NOGG)



1. Pharmacological treatment options for Primary Care

a) Offer oral ***bisphosphonates*** (alendronate or risedronate) or intravenous zoledronate as the most costeffective interventions.

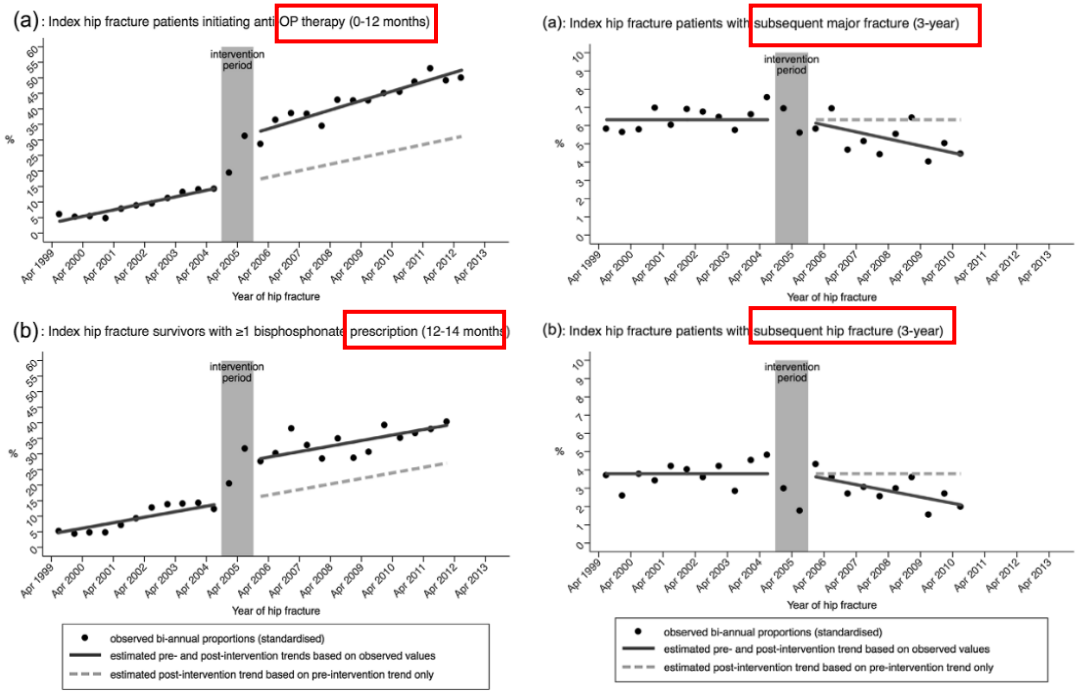
b) Availability of ***parenteral drug therapies in primary care and community healthcare*** settings (Strong recommendation).

c) The patient and the primary care practitioner are ***made aware that denosumab treatment*** should not be stopped or delayed without discussion with a healthcare professional (Strong recommendation).

d) Primary care clinicians should ***always have in mind the possibility of vertebral fracture in postmenopausal women and men aged ≥ 50 years who present with acute onset back pain***, especially thoracic pain, if they have risk factors for osteoporosis (Strong recommendation).

Anti-osteoporosis medication prescriptions and incidence of subsequent fracture among primary hip fracture patients in England and Wales: an interrupted time-series analysis

Samuel Hawley, MSc[1], Jose Leal, DPhil[2], Antonella Delmestri, PhD[1], Daniel Prieto-Alhambra, PhD[1,3,4], Nigel K Arden, MD[1,3], Cyrus Cooper, MD[1,3], M Kassim Javaid, PhD[1,3,*], Andrew Judge, PhD[1,3,*], and The REFReSH study group

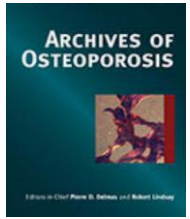


Sample: 11.3 million patients - UK practices- 7% UK population.

Intervention: NICE TA 87 in January 2005 and the first authorisation of generic forms of alendronic acid in August 2005.

NICE TA 87 gave for the first time guidance on clinical thresholds for prescribing various anti-osteoporosis medications among post–menopausal women having sustained a clinically apparent osteoporotic fracture (i.e. in secondary prevention).
It recommended the use of bisphosphonates for the treatment of women aged 75 years or older without the need for prior dual energy X-ray absorptiometry (DEXA) scanning.

Effectiveness of an integrated hospital-community care pathway for fragility fractures' secondary prevention: the PROMOTER-II study



Laura Bogliolo[1] · Silvia Grignaschi[2] · Catherine Klersy[3] · Pietro Perotti[4] · Simona Dalle Carbonare[4] · Silvia Balduzzi[2] · Michela Milanesi[1] · Giuseppe Giuffrè[5] · Carmelinda Ruggiero[6] · Maria Cristina Caffetti[2]

- **9186 subjects from 50 years**, resident in Pavia province (**n: 436.406**), enrolled at the time of hospital admission due to ICD-9-CM codes

- admission due to major FF, in the period **2016–2018** and **2019–2020** **before and after the implementation of the IHCP**

-re-fracture rate: 5.2/100 person/year

-mortality rate: 13.4/100 person/year

Variable	Refractures rate per 100 person-year (95%CI)	Refractures Multivariable model Model chi²(10) 107.94, $p<0.001$ Harrell's C 0.62		Mortality rate per 100 person-year (95%CI)	Mortality Multivariable model Model chi²(10) 1323.68, $p<0.001$ Harrell's C 0.74	
	$N=5.2$ per 100 p/year (4.8–5.7)	HR (95%CI)	p-value	$N=13.4$ per 100 p/year (12.7–14)	HR (95%CI)	p-value
Age			**<0.001**			**<0.001**
<=71	2.7 (2.2–3.3)	1		3.1 (2.6–3.7)	1	
72–80	5.6 (4.9–5.6)	1.83 (1.43–2.36)	<0.001	8.8 (7.8–10.0)	2.70 (2.17–3.36)	<0.001
81–87	6.6 (5.7–7.6)	2.00 (1.56–2.58)	<0.001	15.4 (14.1–17.0)	4.15 (3.37–5.11)	<0.001
>87	6.7 (5.8–7.8)	1.80 (1.38–2.34)	<0.001	30.2 (28.2–32.4)	7.06 (5.77–8.65)	<0.001
Sex			**0.310**			**<0.001**
F	5.4 (4.9–5.9)	1		11.6 (10.9–12.3)	1	
M	4.7 (4.0–5.6)	0.90 (0.75–1.10)		19.1 (17.6–20.7)	1.78 (1.61–1.98)	
IHCP implementation			**<0.001**			**0.046**
Before	4.5 84.0–5.0)	1		12.7 (11.9–13.6)	1	
After	6.1 (5.5–6.8)	1.34 (1.15–1.57)		14.1 (13.2–15.1)	1.10 (1.00–1.21)	
Treatment			**0.139**			**<0.001**
Untreated	5.2 (4.8–5.7)	1		15.2 (14.5–16.0)	1	
Inappropriately	6.0 (4.6–7.8)	1.34 (1.00–1.80)	0.048	0.4 (0.2–1.1)	0.05 (0.02–0.14)	<0.001
Appropriately	3.9 (2.3–6.5)	0.81 (0.48–1.35)	0.416	6.2 (4.2–9.2)	0.55 (0.37–0.82)	0.003
Appropriately and adherent	4.3 (3.0–6.7)	0.85 (0.54–1.34)	0.487	2.1 (1.1–3.8)	0.18 (0.10–0.34)	<0.001
Site of index FF			**<0.001**			**<0.001**
Humerus/wrist	3.6 (3.1–4.2)	1		6.4 (5.7–7.1)	1	
Vertebra	4.2 (3.4–5.1)	1.13 (0.88–1.45)	0.349	10.1 (8.9–11.4)	1.40 (1.19–1.66)	<0.001
Hip	7.2 (6.5–8.0)	1.64 (1.35–1.98)# *#hip vs vertebra p=0.001*	<0.001	21.0 (19.8–22.3)	1.98 (1.74–2.25)# *#hip vs vertebra p<0.001*	<0.001

Integrated care for fragility fractures under DM 77/2022

From hospital to community, together for lifelong bone health

1. ACUTE CARE
Fracture and stabilisation

Hospital (Orthopaedics / Orthogeriatrics)

- Diagnosis and surgical stabilisation
- Early geriatric assessment
- Identification of fragility fracture
- Alert to COT and FSE 2.0

Discharge planning
Automated hand-off to community services (COT, FLS, GP)

2. TRANSITION AND COMMUNITY CARE
Integrated services through DM 77/2022

Territorial Operations Centre (COT)

- Manages patient flow across settings
- Coordinates referral to outpatient FLS and community services
- Uses FSE 2.0 alerts and logistics support
- Ensures continuity of care

Discharge notification

Coordinates care pathway

General Practitioner (GP)

- Co-manages the patient
- Receives FSE 2.0 alerts
- Monitors metabolic parameters
- Renews/switches treatments in collaboration with FLS

Clinical follow-up and shared care

Specialist assessment and treatment initiation

Community House (CdC)

- Multi-professional entry point (~50,000 residents)
- Outpatient FLS and specialist clinics
- BMD/metabolic evaluation (DXA, labs)
- Integrated services (GP, nurse, specialists)
- Telemedicine and remote consultations

Home support and monitoring

Rehabilitation and functional recovery

Family and Community Nurse (IFeC)

- Proactive home visits
- Supports treatment adherence
- Home-hazard assessment and fall prevention
- Gait and balance coaching
- Remote monitoring and teleconsultations

Community Hospital (OdC)

- Short-stay, low-intensity inpatient care (15–20 beds)
- Post-acute rehabilitation
- Continuation of physical therapy
- Stabilisation of bone therapies
- Step-down care closer to home

3. LONG-TERM MANAGEMENT
Adherence, monitoring and fall prevention

Treatment adherence
- Regular monitoring (3, 6, 12 months)
- Long-term therapy (5–10 years)

Fall prevention
- Home safety interventions
- Physical activity and balance training

Remote care and telemedicine
- Virtual check-ins (CdC or home)
- Reduced geographical barriers

Ongoing coordination
- GP, IFeC, FLS and community services
- Shared data via FSE 2.0

Quality indicators and audit
- Capture, assessment, treatment initiation
- Adherence rates
- Outcomes and continuous improvement

Fascicolo Sanitario Elettronico 2.0 (FSE 2.0)
Shared data, real-time alerts, notifications and performance monitoring

Clinical data and alerts ⟷ Shared access ⟷ Monitoring and reporting

Regional and national monitoring
Quality indicators (QIs), audits and population health evaluation

EXPECTED OUTCOMES

- **Appropriate and timely treatment initiation**
  With personalised bone protection
- **Sustained adherence**
  1- to 2-year adherence rates >75%
- **Fewer secondary fractures and falls**
  Improved mobility and function
- **Lower mortality and long-term dependency**
  Better quality of life

A more connected system for stronger bones and healthier lives

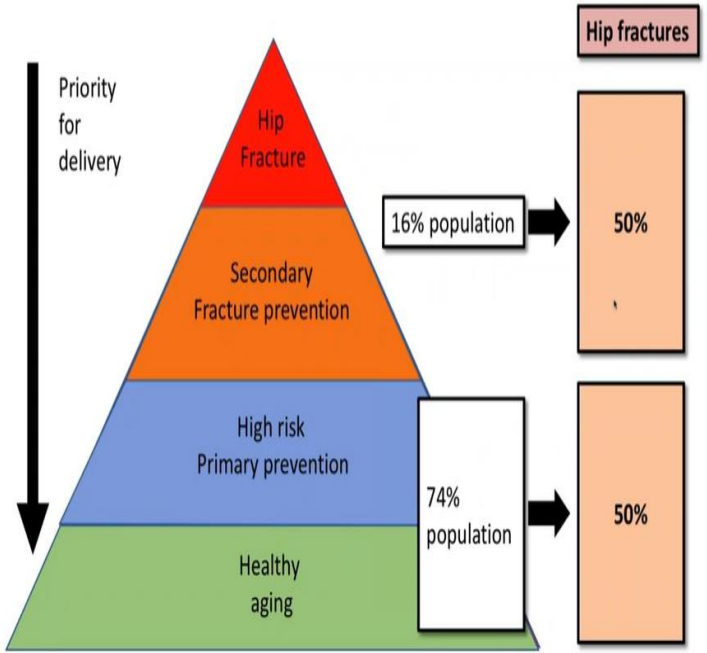
Outline

- FLS to close the care gap in secondary prevention of fragility fractures
  - main features and scope

- Tips to setting up and FLS
  - what does it takes? methodology and resources

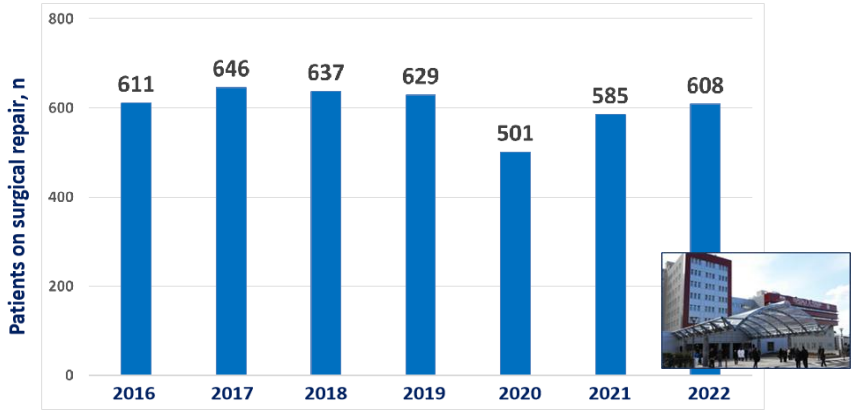
How setting up a Fracture Liaison Service

1. Not every FLS is effective — outcomes scale with model intensity.
Conoscere il contesto nosologico per valutare le modalità e la fattibilità dell'intervento



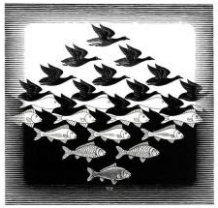
Department of Health Prevention Package for Older People: Falls and Fractures - Effective interventions in health and social care, 2009

%= Identify- Iniatiate - Investigation / To be Identified -Initiated- Investigated



1°: dobbiamo conoscere il denominatore - Fonte SDO

SPECIFIC KPIs in a feasible care PATHWAY



1. Directional & Organizational
2. Core & All Professionals
3. Transmural Actors

KPI 1. Hip fracture

8-10 days

OG ward

Rehab Settings & Home

KPI 14. PROMS

24 weeks

40 days

KPI 2. Major fractures

KPI 3. Surgery<48
KPI 4. Weight-bearing
KPI 5. Walking test
KPI 6. Falls-Fracture Prevention
KPI 7.Medication Revision
KPI 9. Communication

OG/ FLS Out-patient

OG/ FLS Out-patient

KPI 6. Falls-Fracture Prevention
KPI 7.Medication Revision
KPI 9. Communication
KPI 10. Assessment Guidelines
KPI 11. Vertebral Fracture

52 weeks

KPI 12. Persistence
KPI 15. Re-fracture

KPI 13. Database
KPI 16. Audit

How setting up a Fracture Liaison Service

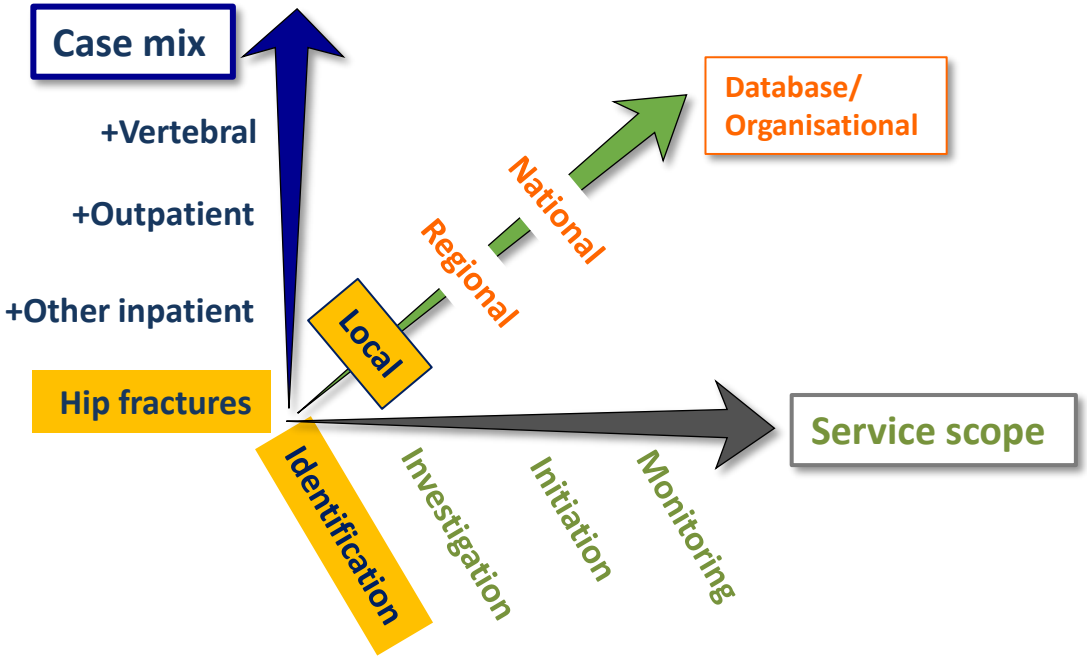
1.Patient Identification
2. Patient Assessment
3. Timing of Post-Fracture Assessment
4. Identification of Vertebral Fx
5. Adherence to Guidelines
6. Secondary Causes of Osteoporosis
7. Falls Prevention Service
8. Multidimensional Assessment
9. Treatment Initiation
10. Treatment Review
11. Communication Strategy
12. Long-Term Management
13. Database

Key Performance Indicators required to track and measure performance at each stage of the care pathway.

Identify and intervene for the largest possible number of patients at high risk of fracture; these patients should be started on the most effective treatments as soon as possible (0–90 days) following a fracture and monitored over time.

How setting up a Fracture Liaison Service

4. start with the smallest scalabel unit



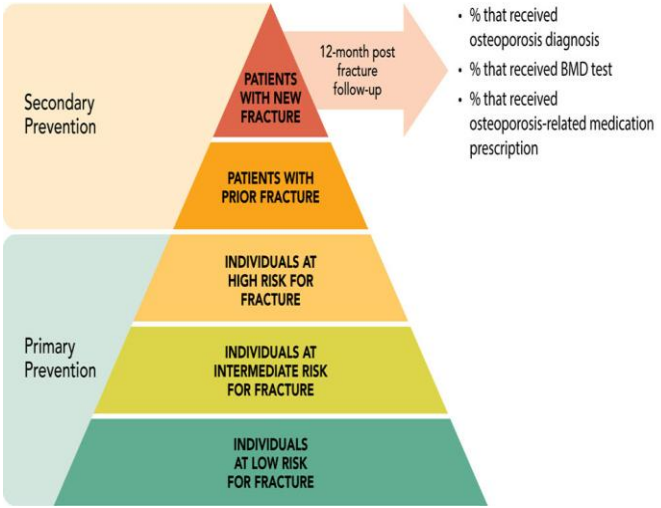
Rule of thumb

How setting up a Fracture Liaison Service

4. start with the smallest scalabel unit by measuring what you are doing

Gennaio- Giugno 2020	Frattura femorale			Nov- Dic 2020
KPIs and standars of care	Attivo	Inattivo	N (%) <90gg	Obiettivo
1. Identificazione paziente	x		100 (30%)	Identificati e monitorati
2. Valutazione paziente	x		30%	70-90%
3. Tempi valutazione post-frattura	x			8-12 settimane
4. Identificazione Fx vertebrali		x		Approccio clinico-strumentale/FLS
5. Attinenza linee guida	x		50%	Lg regionali-nazionali
6. Cause secondarie OP	x		15%	70-90%
7. Servizio prevenzione cadute		x		70-90%
8. Valutazione multidimensionale	x			70-90%
9. Avvio trattamento	x		90%	70-90%
10. Revisione trattamento	x			70-90%
11. Strategia comunicazione		x		Comunicato al MMG/ 50-90% criteri
12. Gestione lungo-termine	x			>12 mesi frattura
13. Database	x		20%	Sistema rgionale-nazionale

Revisionare il processo dal punto di vista del paziente e del servizio



5. Use local data not impressions and methodology for improvement

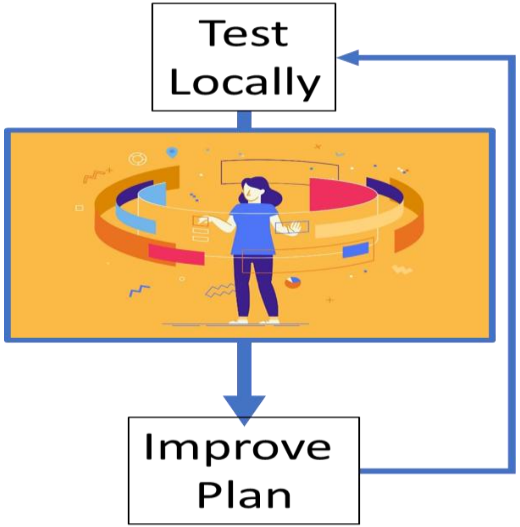
Berwick: triple aim

1. Effective
2. Efficient
3. Patient Experience

FLS name	Number of cases submitted	Number of fields (out of 29) with 20% or greater missing data – n	Hip case ascertainment – %	Non-hip case ascertainment – %	Within 90 days (diagnosis to assessment) – %	Within 90 days (diagnosis to DXA) – %	Bone therapy missing – %	Falls assessment done or referred – %	Patients followed up (of those prescribed bone therapy or referred for further clinical opinion/GP) – %
Barnet Hospital Fracture Liaison Service	156	3	*	17.8	93.6	77.1	20.5	91.7	83.3
Bromley Healthcare Falls and Fracture Prevention Service	283	2	6.9	38.7	100	92.4	31.1	100	78.2
Broomfield Hospital	382	9	27.5	30.9	93.7	15.9	5	1.6	0
Dorset County Hospital	536	20	81.3	59.8	90.9	63	36.2	0.9	0
East Lancashire Hospitals NHS Trust	273	3	*	26.3	96	72.5	33.3	8.4	62.5
East Surrey Hospital	233	2	*	22.6	5.2	6.1	*	99.6	0
FLS West Berkshire	358	3	5.1	43.8	96.6	81.2	*	18.2	63.1
Guys and St Thomas' NHS Foundation Trust	284	21	15.0	62.4	4.9	*	98.7	9.5	0
King's College Hospital – Denmark Hill site	79	7	*	24.3	98.7	*	100	2.5	0
Medway NHS Foundation Trust	436	12	59.0	53.2	0	*	70.9	0.9	2.2
Milton Keynes University Hospital Foundation Trust	134	12	6.0	22.2	95.5	34.1	44	47	60
Musgrove Park Hospital	811	0	106.5	74.8	77.2	80.5	3.3	65.8	73.7
North Bristol NHS Trust	1,111	9	94.3	81.5	74.9	57.9	2.3	55.1	49.3
North Tees and Hartlepool NHS Foundation Trust	553	9	52.9	53.4	99.8	53.3	14.5	53.9	0
Nottingham University Hospitals	1,250	11	77.2	63.6	99.4	0	82.2	33	0
Oxfordshire Fracture Prevention Service	1,210	7	54.7	70.7	73.8	53.7	0.8	24.9	26.9
Peterborough and Stamford Hospitals NHS Foundation Trust	260	2	5.6	28.5	92.3	67.8	100	95.8	0
Poole General Hospital	69	15	*	3.5	0	0	95.8	40.6	0
Portsmouth and Southeast Hampshire	936	16	11.9	57.0	91.1	72.5	1.6	0.2	0
Queen Elizabeth Hospital, Woolwich	109	7	7.1	13.8	*	0	0	1.8	5.3
Royal Surrey County Hospital	251	1	7.9	38.7	92.8	74.3	13.9	93.2	59.6
Royal Wolverhampton Hospital NHS Trust	285	16	7.8	26.9	96.1	*	60.7	1.1	0
Sandwell and West Birmingham Hospitals NHS Trust	86	11	2.6	1.2	51.2	18.5	69.8	90.7	0
St George's Hospital	725	15	127.0	131.3	43.7	68.7	51.6	46.9	15.7
Sunderland Royal Hospital	584	2	63.6	49.2	99.1	56.6	90.5	67	30.2
The Haywood Hospital Burslem Stoke-on-Trent	644	0	15.8	38.8	84	83.6	15.1	2.6	45.5
The Hillingdon Hospitals NHS Foundation Trust	110	0	5.0	24.8	90.9	70.8	0	5.5	50
The Ipswich Hospital NHS Trust	944	14	87.2	80.7	35.2	25.9	10.9	52.1	19.3
The Rotherham NHS Foundation Trust	109	8	*	20.6	86.2	86.1	31.8	16.5	0
United Lincolnshire Trust	1,218	13	56.1	63.0	0	86.8	0	0	0
University Hospital Lewisham	191	11	43.2	52.0	74.3	74.5	27.7	31.9	36
University Hospital Llandough	344	10	2.4	32.2	86.6	*	18.9	3.5	13.2
University Hospital of North Durham and Darlington Memorial Hospital	835	14	47.4	46.4	76.2	43.1	22.2	2.2	48.1
University Hospitals Birmingham NHS Foundation Trust	643	4	45.4	58.3	72.3	21.3	20.3	57.4	68.1
University Hospitals Bristol NHS Foundation Trust	679	12	100.6	81.1	20	63.9	0.3	0.6	38.9
West Suffolk Fracture Liaison Service	219	3	29.4	22.4	63.5	74.7	6.4	57.1	76.3
Wye Valley NHS Trust	231	4	*	33.9	98.3	0	0.9	97	0.8
Yeovil Hospital	795	6	97.5	98.3	46.2	*	12.6	30.8	71.8
Overall (Average)	**18,356**	**–**	**35.6**	**45.5**	**66.9**	**46.5**	**33.2**	**32.3**	**36.4**

SMART aim

Specific, Measurable, Attainable, Relevant, Time-bound



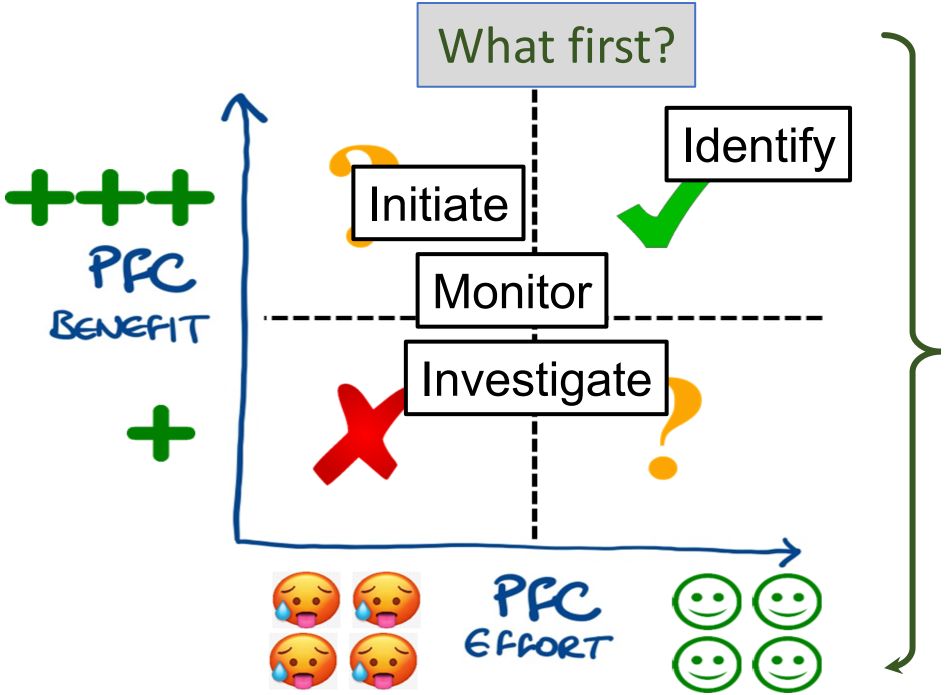
How improving a Fracture Liaison Service

5. Use local data not impressions and methodology for improvement

Berwick: triple aim

1. Effective
2. Efficient
3. Patient Experience

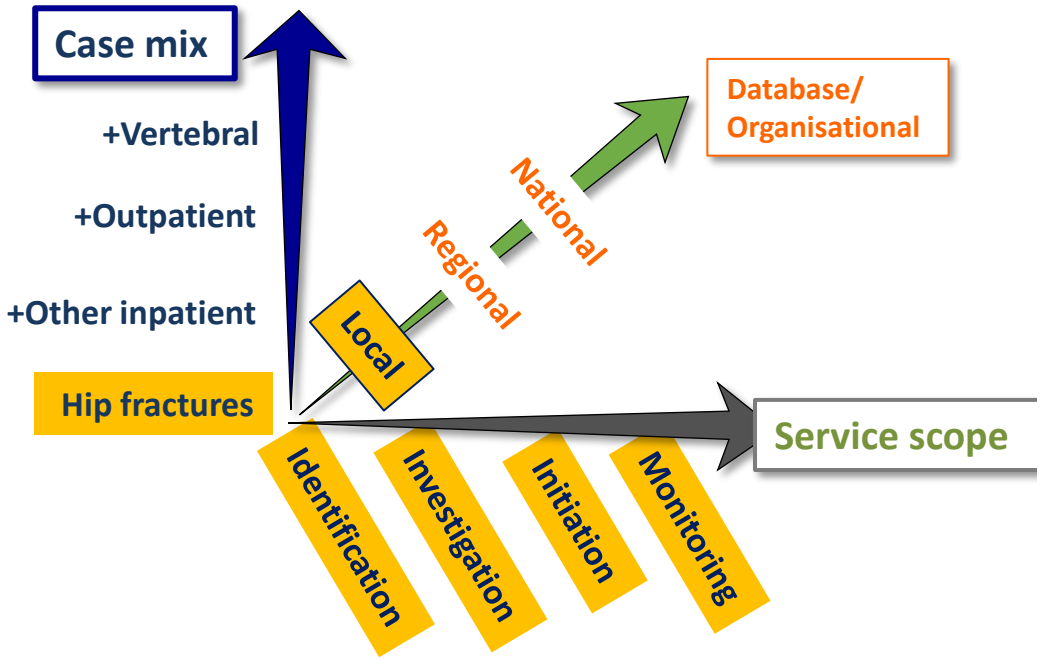
FLS name	Number of cases submitted	Number of fields (out of 29) with 20% or greater missing data – n	Hip case ascertainment – %	Non-hip case ascertainment – %	Within 90 days (diagnosis to assessment) – %	Within 90 days (diagnosis to DXA) – %	Bone therapy missing – %	Falls assessment done or referred – %	Patients followed up (of those prescribed bone therapy or referred for further clinical opinion/GP) – %
Barnet Hospital Fracture Liaison Service	156	3	*	17.8	93.6	77.1	20.5	91.7	83.3
Bromley Healthcare Falls and Fracture Prevention Service	283	2	6.9	38.7	100	92.4	31.1	100	78.2
Broomfield Hospital	382	9	27.5	30.9	93.7	15.9	5	1.6	0
Dorset County Hospital	536	20	81.3	59.8	90.9	63	36.2	0.9	0
East Lancashire Hospitals NHS Trust	273	3	*	26.3	96	72.5	33.3	8.4	62.5
East Surrey Hospital	233	2	*	22.6	5.2	6.1	*	99.6	0
FLS West Berkshire	358	3	5.1	43.8	96.6	81.2	*	18.2	63.1
Guys and St Thomas' NHS Foundation Trust	284	21	15.0	62.4	4.9	*	98.7	9.5	0
King's College Hospital - Denmark Hill Site	79	7	*	24.3	98.7	*	100	2.5	0
Medway NHS Foundation Trust	436	12	59.0	53.2	0	*	70.9	0.9	2.2
Milton Keynes University Hospital Foundation Trust	134	12	6.0	22.2	95.5	34.1	44	47	60
Musgrove Park Hospital	811	0	106.5	74.8	77.2	80.5	3.3	65.8	73.7
North Bristol NHS Trust	1,111	9	94.3	81.5	74.9	57.9	2.3	55.1	49.3
North Tees and Hartlepool NHS Foundation Trust	553	9	52.9	53.4	99.8	53.3	14.5	53.9	0
Nottingham University Hospitals	1,250	11	77.2	63.6	99.4	0	82.2	33	0
Oxfordshire Fracture Prevention Service	1,210	7	54.7	70.7	73.8	53.7	0.8	24.9	26.9
Peterborough and Stamford Hospitals NHS Foundation Trust	260	2	5.6	28.5	92.3	67.8	100	95.8	0
Poole General Hospital	69	15	*	3.5	0	0	95.8	40.6	0
Portsmouth and Southeast Hampshire	936	16	11.9	57.0	91.1	72.5	1.6	0.2	0
Queen Elizabeth Hospital, Woolwich	109	7	7.1	13.8	*	0	0	1.8	5.3
Royal Surrey County Hospital	251	1	7.9	38.7	92.8	74.3	13.9	93.2	59.6
Royal Wolverhampton Hospital NHS Trust	285	16	7.8	26.9	96.1	*	60.7	1.1	0
Sandwell and West Birmingham Hospitals NHS Trust	86	11	2.6	1.2	51.2	18.5	69.8	90.7	0
St George's Hospital	725	15	127.0	131.3	43.7	68.7	51.6	46.9	15.7
Sunderland Royal Hospital	584	2	63.6	49.2	99.1	56.6	90.5	67	30.2
The Haywood Hospital Burslem Stoke-on-Trent	644	0	15.8	38.8	84	83.6	15.1	2.6	45.5
The Hillingdon Hospitals NHS Foundation Trust	110	0	5.0	24.8	90.9	70.8	0	5.5	50
The Ipswich Hospital NHS Trust	944	14	87.2	80.7	35.2	25.9	10.9	52.1	19.3
The Rotherham NHS Foundation Trust	109	8	*	20.6	86.2	86.1	31.8	16.5	0
United Lincolnshire Trust	1,218	13	56.1	63.0	0	86.8	0	0	0
University Hospital Lewisham	191	11	43.2	52.0	74.3	74.5	27.7	31.9	36
University Hospital Llandough	344	10	2.4	32.2	86.6	*	18.9	3.5	13.2
University Hospital of North Durham and Darlington Memorial Hospital	835	14	47.4	46.4	76.2	43.1	22.2	2.2	48.1
University Hospitals Birmingham NHS Foundation Trust	643	4	45.4	58.3	72.3	21.3	20.3	57.4	68.1
University Hospitals Bristol NHS Foundation Trust	679	12	100.6	81.1	20	63.9	0.3	0.6	38.9
West Suffolk Fracture Liaison Service	219	3	29.4	22.4	63.5	74.7	6.4	57.1	76.3
Wye Valley NHS Trust	231	4	*	33.9	98.3	0	0.9	97	0.8
Yeovil Hospital	795	6	97.5	98.3	46.2	*	12.6	30.8	71.8
Overall (Average)	18,356	–	35.6	45.5	66.9	46.5	33.2	32.3	36.4



How does it affect measures of

- outcome
- process
- balancing

Fragility Fracture Prevention
Efficacy and Sustainability and Scalability

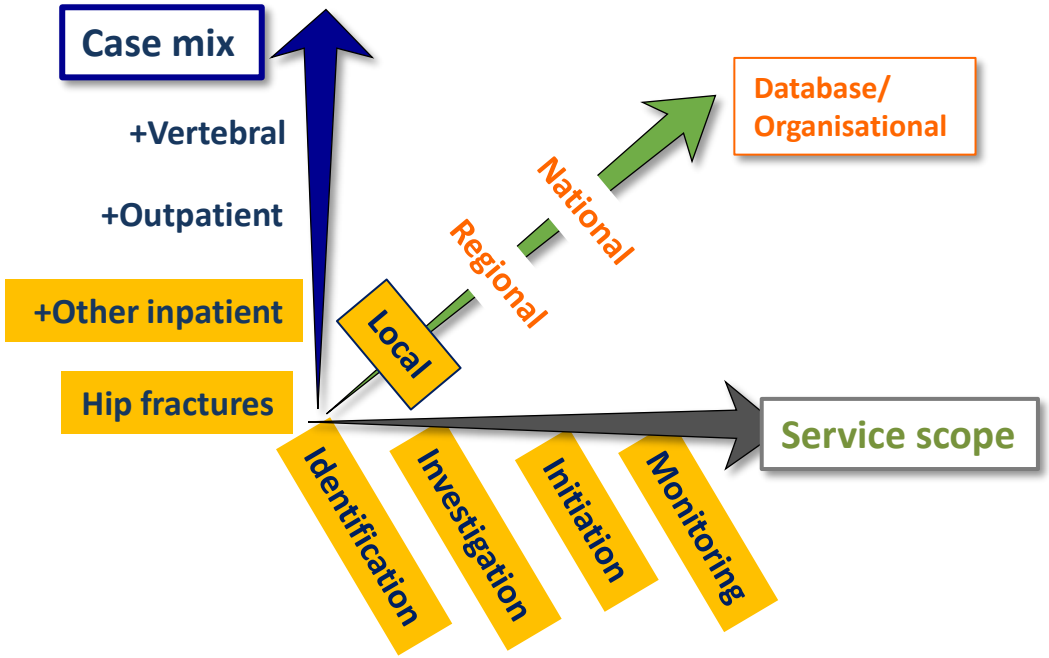


Ottimizzazione del percorso ortogeriatrico del paziente con frattura di femore

Presenza di una figura di **Case Manager** che predispone e riporta in relazione di dimissione l'appuntamento per:

- **Visita ortogeriatrica multidisciplinare** a 30-40 giorno
- **Esami bioumorali** programmati 7 giorni prima della visita
- **Esami strumentrali** da programmare contestualmente alla visita

Fragility Fracture Prevention
Efficacy and Sustainability and Scalability



Attivazione del percorso per la gestione dei pazienti dimessi dopo ricovero per frattura Maggiore

- Target: paziente ricoverato per frattura da fragilità extra-femore (**circa 300 pazienti/anno**)
- Attribuzione di **diagnosi di frattura da fragilità**, indicazione a ricovero, **attivazione case manager**
- Indicazione **entro 90 giorni** dalla dimissione a **esami strumentali e visita osteometabolica**

Fragility Fracture Prevention - Efficacy and Sustainability

High Added Value for the System = **Big Population benefit (Denominator)**

Competencies:

- bone specialists
- case managers
- clinical manager (GPs)

Methodology:

- tools
- oriented to priorities

Background

What about MI recurrence?

MI recurrence is estimated at 5-7% over a median follow-up of 10 years, with higher risk in the first year and lower rates in subsequent years.

(Smolina K et al, Circulation, 2012; Bruno F et al, Int J Card 2022)

Hip	630	19	3.02	42	6.67	84	13.33
Proximal humerus	997	26	2.61	52	5.22	117	11.74
Multiple fractures	214	13	6.07	20	9.35	42	19.63
All other fractures*	1138	30	2.64	57	5.01	120	10.54

*Includes femur, spine, pelvis, clavicle, elbow, tibia/fibula, and other fragility fractures

Effectiveness of fracture liaison service in reducing the risk of secondary fragility fractures in adults aged 50 and older: a systematic review and meta-analysis

Osteoporos Int
2024

Musa Sani Danazumi[1,2] · Nicol Lightbody[3] · Gordana Dermody[4]

The primary characteristics broadly included

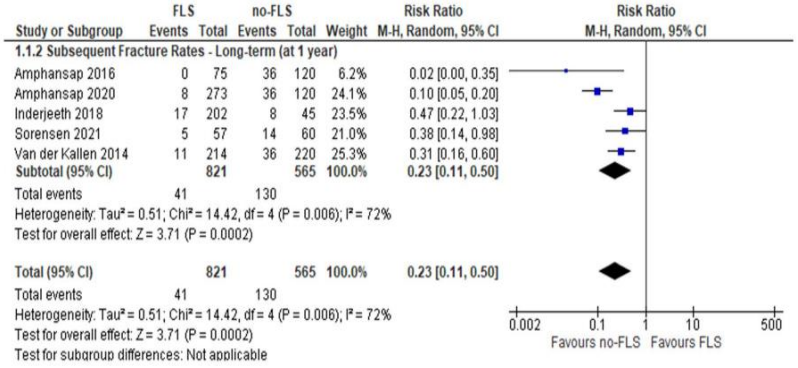
(1) identification of patients with fragility fracture **when patients access hospital care**;

(2) evaluation of risk using different tests and/or procedures;

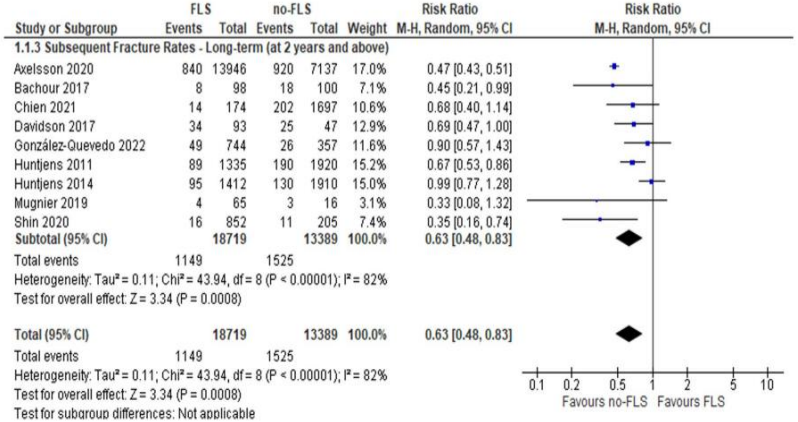
(3) establishment of a diagnosis, treatment recommendations, and/or **initiation**;

(4) outpatient follow-up either with the FLS or **referral to primary care doctor**;

(5) education and communication with the patient's physician at **handover f**rom the FLS to the primary care physician.



b: Subsequent fracture rate – long-term (at 1 year)



c: Subsequent fracture rate – long-term (at 2 years and above)

Effectiveness of fracture liaison service in reducing the risk of secondary fragility fractures in adults aged 50 and older: a systematic review and meta-analysis

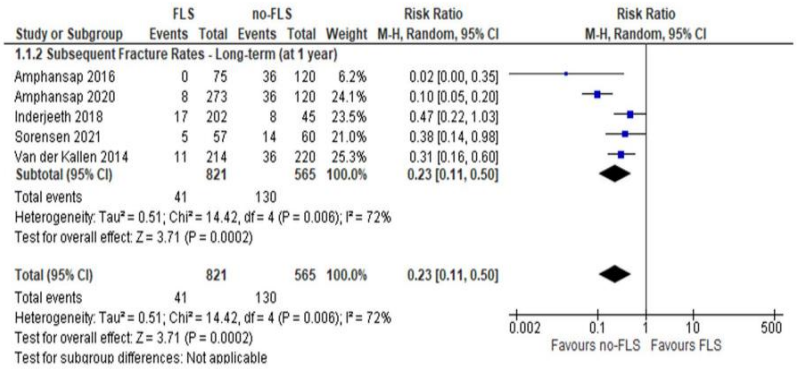
Osteoporos Int 2024

Musa Sani Danazumi[1,2] · Nicol Lightbody[3] · Gordana Dermody[4]

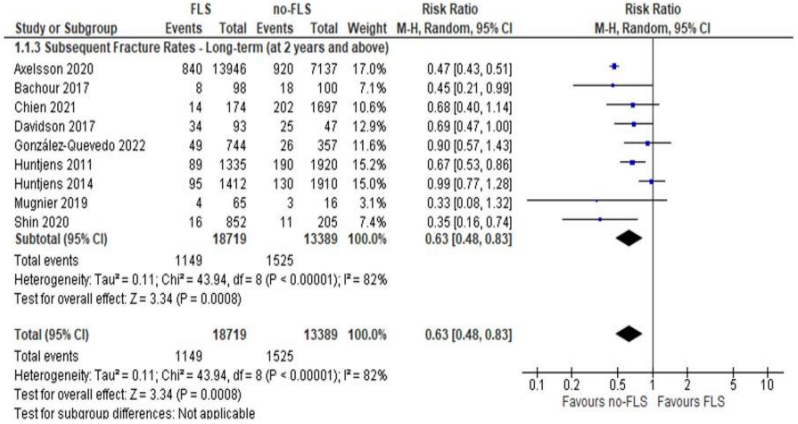
The **process** of identifying patients at risk for secondary fracture varied based on the health system:

- 67%: identifies, investigates, and initiates **<u>treatment without</u> a referral to primary care physicians** (***best practice***)

- Inderjeeth et al: ED information system to detect minimal trauma fracture prior to discharge
- Eekman et al: direct referral from ED to FLS of minimal trauma fracture



b: Subsequent fracture rate – long-term (at 1 year)



c: Subsequent fracture rate – long-term (at 2 years and above)

Fracture liaison services improve outcomes of patients with osteoporosis-related fractures: A systematic literature review and meta-analysis

Chih-Hsing Wu [a,b,*], Shih-Te Tu [c], Yin-Fan Chang [a], Ding-Cheng Chan [d,e,f], Jui-Teng Chien [g], Chih-Hsueh Lin [h], Sonal Singh [i], Manikanta Dasari [j], Jung-Fu Chen [k], Keh-Sung Tsai [l,**]

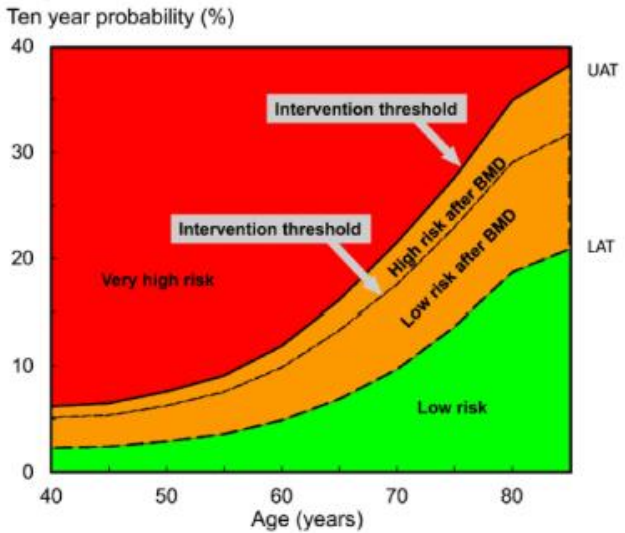
Patients' Outcome	Follow-up duration, m	Without FLS	With FLS	p	NNT
Subsequent Fractures	6-72	13.4%	6.4%	<.05	20
Mortality	6- 72	15.8%	10.4%	<.05	33
BMD testing	3- 26	48.0%	23.5%	<.05	4
Initiation	3- 72	17.2%	38.0%	<.05	5
Adherence	6- 48	34.1%	57.0%	<.05	5
Subsequent Falls	?	?	?	?	?

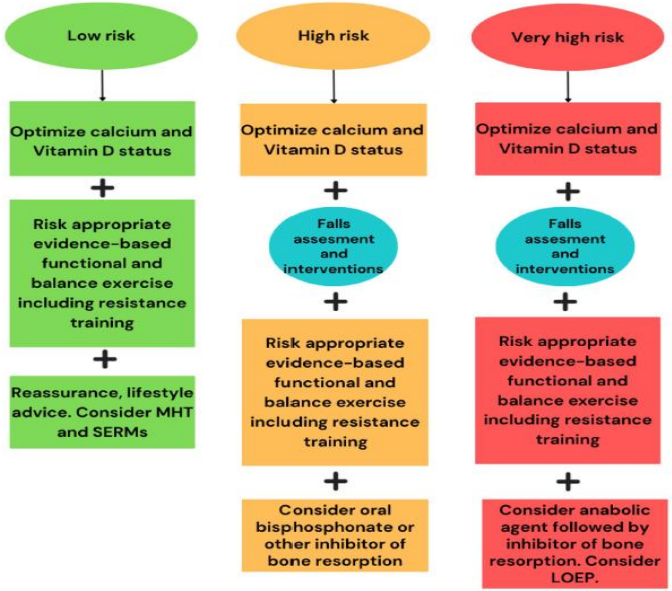
Wu CH et al, Bone 2018

Position paper: a coordinated approach to fracture and fall prevention from seven international organizations

Nathalie van der Velde[1,2] · Lotta J. Seppala[1,2] · Gulistan Bahat[3] · Hubert Blain[4] · Alvaro Casas Herrero[5,6,7] · Nicholas C. Harvey[8,9,10] · Tahir Masud[11] · René Rizzoli[12] · Jean-Yves Reginster[13] · Carmelinda Ruggiero[14] ·

EGM European Geriatric Medicine





MHT=menopausal hormone therapy, SERM=selective estrogen receptor modulator, LOEP=local osteo-enhancement procedure. Low, high and very high risk correspond to risk categories in Figure 3. For exercise recommendations, we refer to *Strong, steady and straight: UK consensus statement on physical activity and exercise for osteoporosis [30].*

Fig. 4 Treatment pathways and fall assessment/management according to the categorization of fracture risk. Adapted from [20]

WHO benchmarks for equitable hip-fracture care and osteoporosis treatment in older people

Manju Chandran[1,2,3], Jotheeswaran A. Thiyagarajan[4] ✉, Majed Alokail[3,5], Olivier Bruyère[3,6], Nicl
Rene Rizzoli[3,8], Nicola Veronese[3,9,10] & Jean-Yves Reginster[3,5]

- **Hip-fracture surgery < 48 h**
- **Initiation of pharmacological treatment** for osteoporosis soon after fracture

«**Sentinel measures** of a health system's readiness for rapidly ageing populations»

«Change requires sustained political commitment, investment in workforce and digital infrastructure, and a shift in mindset that treats a fracture **not as the end of care but as the starting point** for lifelong bone-health management.

Table 1 | Optimizing timely hip-fracture care barriers and actionable strategies

Event	Potential barriers	Solutions and strategic implementations
ED assessment and triage	Inefficient triage due to lack of clear protocols Inability of ED staff to recognize fragility fractures due to insufficient knoweldge Lack of timely access to imaging	Clearly defined protocols for hip fracture triage in ED Fragility fracture recognition training for ED staff Standing orders for imaging if fracture suspected in older fallers Implementation of geriatric triage screening tools Pre-hospital notification systems to trigger hip-fracture care pathways
Surgical team consultation and planning; medical assessment and optimization	Presence of comorbidities that require assessment and stabilization Delays in acquisition of imaging tests Delays in obtaining laboratory results, ECGs or risk clearance Anticoagulation or polypharmacy concerns not addressed Delay in referrals to medical teams for management of comorbidities Delays in orthopaedic consultation No 24/7 orthopaedic team coverage (especially on weekends)	Standardized pre-operative care pathways Automated ED-to-orthopaedics alerts Hip fracture 'fast-track' protocol Multidisciplinary checklists for pre-surgical readiness Standing orders for labs and/or ECGs for suspected hip fractures Early orthogeriatric co-management
Hip-fracture surgery	Limited access to surgical scheduling systems and limited surgical slots Out-of-pocket expenses (especially in LMICs) Lack of theatre prioritization for hip fractures No target time for surgery set as standard (such as ≤48 h)	Dedicated surgical slots and/or teams Clinical checklists and care bundles Time-to-surgery audit benchmarks (e.g. national registry standards) Financial subsidies or bundled payment models Care Coordinator to ensure surgery readiness by 36–48 h
Post-operative care; in-hospital rehabilitative care; osteoporosis assessment and medication initiation	Insufficient inpatient physiotherapy and rehabilitative resources No delirium prevention protocols Osteoporosis not linked as the cause of the fracture Delays or inaccessibility to DXA and specialized labs to check for secondary osteoporosis Concern about starting osteoporosis medications too early after fracture and adverse effects of medicines No clear referral pathway to endocrinology and/or rheumatology No inpatient and/or bedside counselling of patients	Interdisciplinary rounds (physiotherapy, occupational therapy, nursing) Hip Fracture Care pathways with early mobilization targets Delirium screening and prevention protocols Referral to FLS for medication counselling, for treatment recommendations and to facilitate referrals to appropriate departments Standing orders for BMD testing post-fracture (as baseline for therapy monitoring once initiated) Digital health tools with embedded decision support for osteoporosis diagnosis and treatment and tracking of medication initiation
Discharge and outpatient follow-up	No post-discharge continuity of care No communication with primary care provider and no documentation of treatment plan Non-adherence to medications Inconsistent follow-up scheduling	FLS co-ordinator follow-up Discharge summaries with a clear osteoporosis treatment plan Integration with primary-care electronic medical record Telehealth follow-up with pharmacist and/or nurse National patient registries to track medication adherence

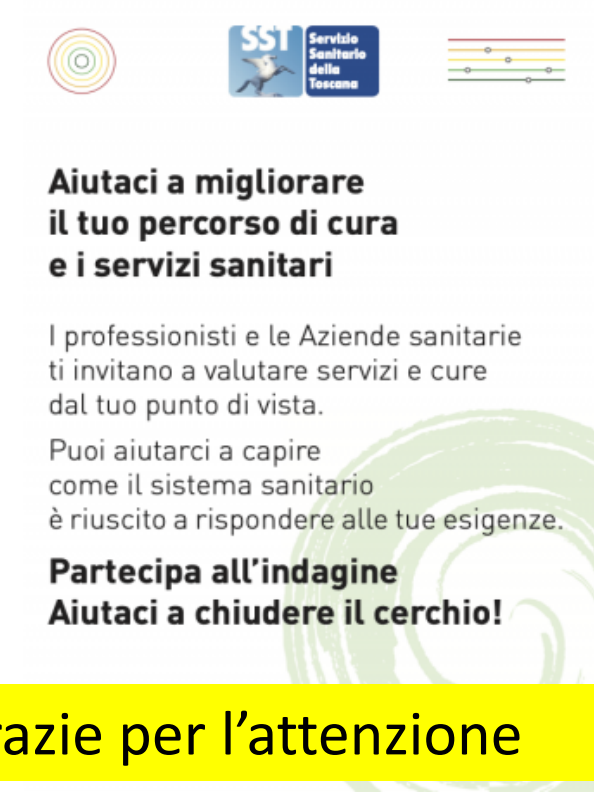
BMD, bone mineral density; DXA, dual-energy X-ray absorptiometry; ECG, electrocardiogram; ED, emergency department; FLS, fracture liaison services; LMICs, low- and middle-income countries.

What's matter to older persons?

Fracture Liaison/Prevention Service Patient Experience Survey

This survey aims to collect information about your experience of the care provided by the Fracture Liaison/Prevention Service. By completing this survey, you can help to improve the service for future patients. For each statement, please put a tick in the box that most closely represents how you feel.

		Statement	Strongly agree	Agree	Disagree	Strongly disagree	Not Applicable
Interactions	1	During my interactions with the Fracture Liaison/Prevention Service team I felt I was treated respectfully, as an individual.	☐	☐	☐	☐	☐
Investigations	2	During my bone density assessment (DXA scan) the person doing the scan explained what was going to happen and why.	☐	☐	☐	☐	☐
	3	The results of my bone density assessment (DXA scan) were explained to me clearly.	☐	☐	☐	☐	☐
Information	4	I have been given information about bone health and reducing my future fracture risk in a way that I could understand.	☐	☐	☐	☐	☐
	5	I have been given information about organisations where I can obtain further information or support (e.g. the Royal Osteoporosis Society).	☐	☐	☐	☐	☐
	6	I have had the opportunity to access information and/or education to help me manage my condition better.	☐	☐	☐	☐	☐
Intervention	7	I was as involved as I wanted to be in decisions about my care and treatment by the Fracture Liaison/Prevention Service team.	☐	☐	☐	☐	☐
	8	I feel that the benefits and side effects of any treatment I was offered were adequately explained.	☐	☐	☐	☐	☐
	9	I feel that I have a good understanding of the treatment I am taking or that I've been offered for my osteoporosis.	☐	☐	☐	☐	☐
	10	I know who to contact to discuss any concerns about my bone health and / or my treatment.	☐	☐	☐	☐	☐



Grazie per l'attenzione

Incidence, risk factors, prognosis of periprosthetic fractures post hip fracture: unveiling protective role of anti-osteoporotic medication

Shao-Wei Lo[1] · Hung-Kuan
Chen-Yu Wang[4,8]

Periprosthetic fractures: an unrecognized osteoporosis crisis

Neil Binkley[1] · Brian Nickel[2] · Paul A. Anderson[2]

				Failure probability (%)			
Outcome	Patient No	event	(%)	1y	2y	3y	4y
All-cause mortality							
Periprosthetic fracture	443	146	(33.0)	16.3	28.7	37.9	46.7
Second hip fracture	2285	681	(29.8)	18.37	29.5	40.2	50.0
Subsequent major osteoporotic fracture							
Periprosthetic fracture	443	33	(7.5)	4.8	8.1	10.4	13.3
Second hip fracture	2285	85	(3.7)	2.2	4.8	6.9	8.1

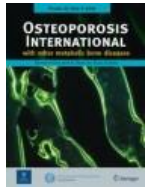
Outline

- Services for secondary prevention of fragility fractures
  - main features and scope

- Tips to setting up and FLS
  - what does it takes? methodology and resources

- Brief summary of local experience
  - what traps should be avoided

Post-fracture care programs for prevention of subsequent fragility fractures: a literature assessment of current trends



K.E. Åkesson[1,2] · K. Ganda[3,4] · C. Deignan[5] · M.K. Oates[5] · A. Volpert[6] · K. Brooks[7] · D. Lee[8,9] · D.R. Dirschl[10] · A.J. Singer[11]

2022

Program model	Inpatient care	Orthogeriatric inpatient care[a]	Outpatient care	Post-discharge care	Coordinator based	Primary prevention
Fracture liaison service (FLS) or Fracture prevention service (FPS)	Yes/no	Yes	Yes	Yes	Yes	No
Orthogeriatric services (OGS) or Geriatric fracture center (GFC)	Yes/no	Yes	Usually no	Usually no	Yes/No	No
Osteoporosis liaison service (OLS)	Yes	Yes	Yes	Yes	Yes	Yes
Other post-fracture care (PFC)	Yes	Yes	Yes	Usually yes	Usually yes	No

• Orthogeriatric Care Program

The fourth step: watch your pathway using Key Performance Indicators (KPI)

1. Patient Identification
2. Patient Management drive by CGA
3. Patient Surgery<48h
4. Early weight-bearing
5. Short & long-term Functional Recovery
6. Falls and Fracture Prevention
7. Medication Review and Initiation
8. Post-Surgical Assessment & Management
9. Communication Strategy
10. Assessment Guidelines (X-ray; DXA)
11. Vertebral Fracture Identification
12. Long-term Management & Persistence
13. Re-fractures
14. PROMS
15. Database
16. Audit

Outcome measure: the measure ultimately you want to affect

i.e. number of patients >50 yrs on treatment after 12 months from index event

Process measures: reflects the way your system and your processes work to deliver what you want

i.e. number of patients able to be monitored at 12 months from index event

Balancing measures: they track if you are introducing problems in another part of the system

i.e. waiting list for assessment