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# “Closing the care gap to prevent the next fracture: The UK experience.”

MK Javaid

Associate Professor in Metabolic Bone Disease, University of Oxford

Hon Consultant Rheumatologist, Nuffield Orthopaedic Centre

# Declarations

In last five years received honoraria, travel and/or subsistence expenses from:

- Amgen, Eli Lilly, Medtronic, Novartis, Proctor and Gamble, Servier, Shire, Internis, Consilient Health, Stirling Anglia Pharmaceuticals, Mereo Biopharma, Optasia

Clinical lead for RCP FLS database audit

# Aims

- UK care gap
- FLS challenges
- Quality improvement

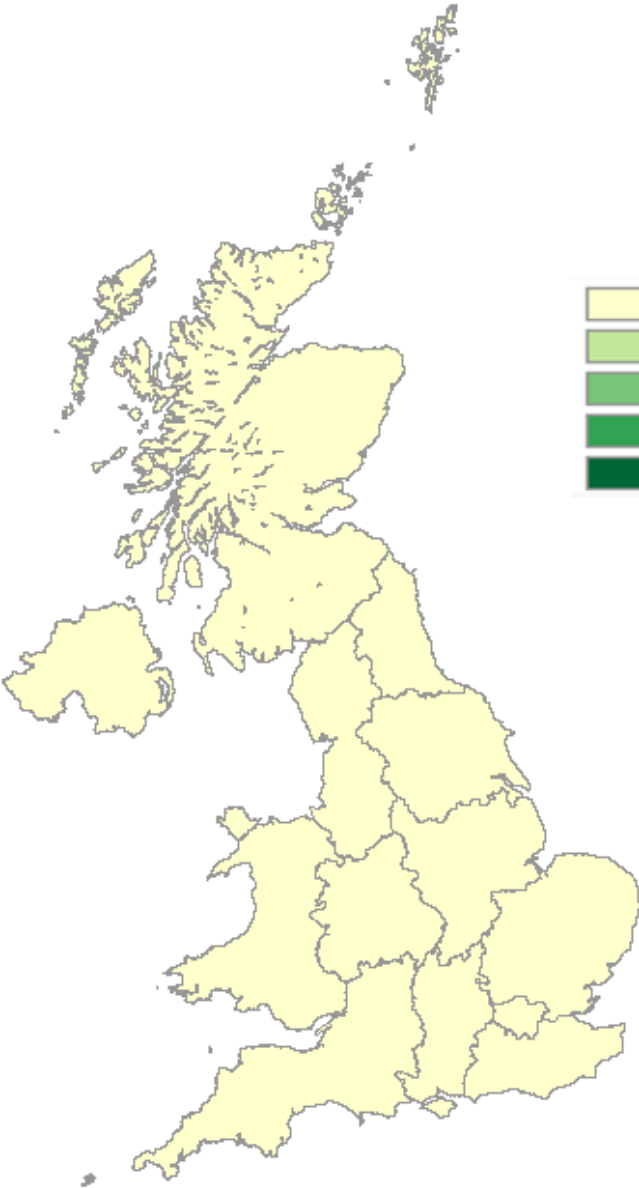
More than 80% of patients after a seeing a doctor with a fragility fracture receive inadequate care.

## Falling standards, broken promises

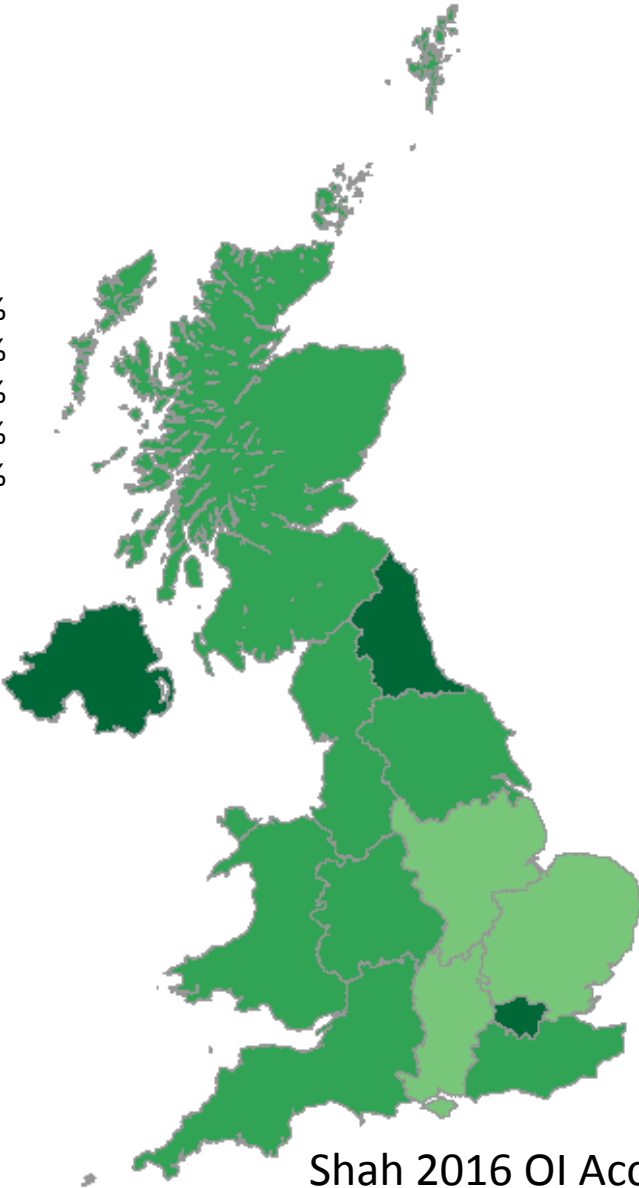
Report of the national audit  
of falls and bone health in  
older people 2010

Incident prescriptions of all anti resorptives before and after hip fracture

Prescriptions 0-6 months prior



Prescriptions 0-4 months post




What are the barriers?

# Prioritization for UK health care system-

Reduce  
Premature  
Mortality  
in young

Prevent  
Avoidable  
Morbidity  
in elderly

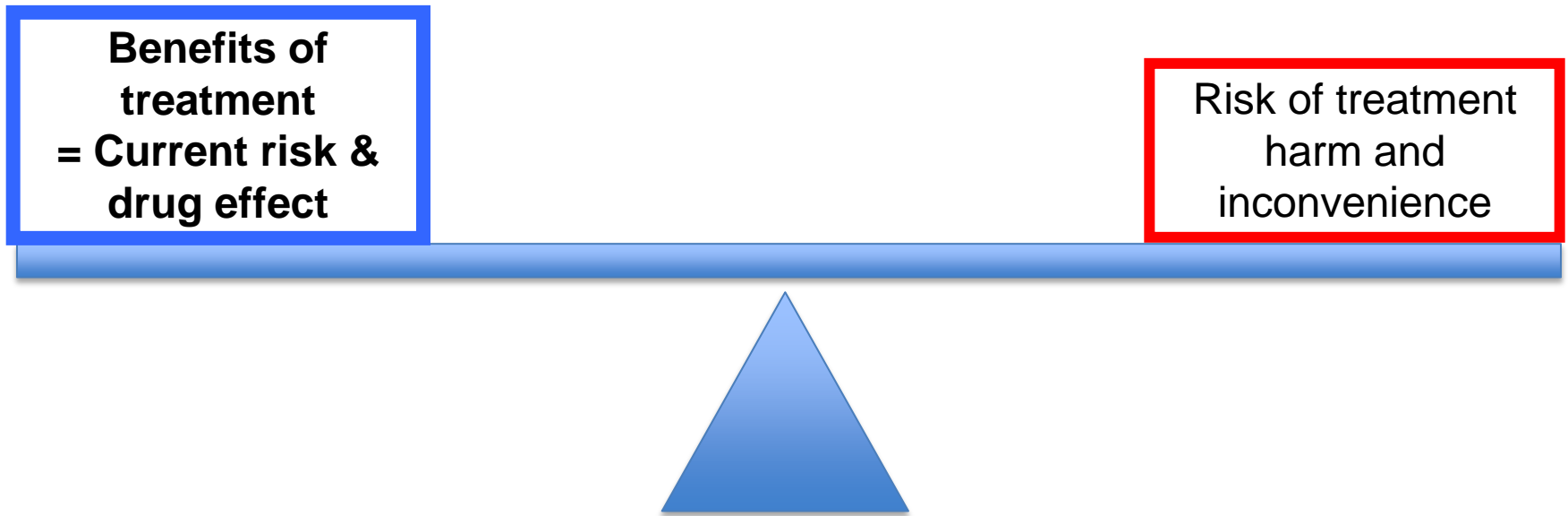


In 35 years:  
30% increase in >65yr  
100% increase in >85yr

Overwhelm health systems  
Divert investment away from younger

> URGENT need to address and prevent avoidable fractures

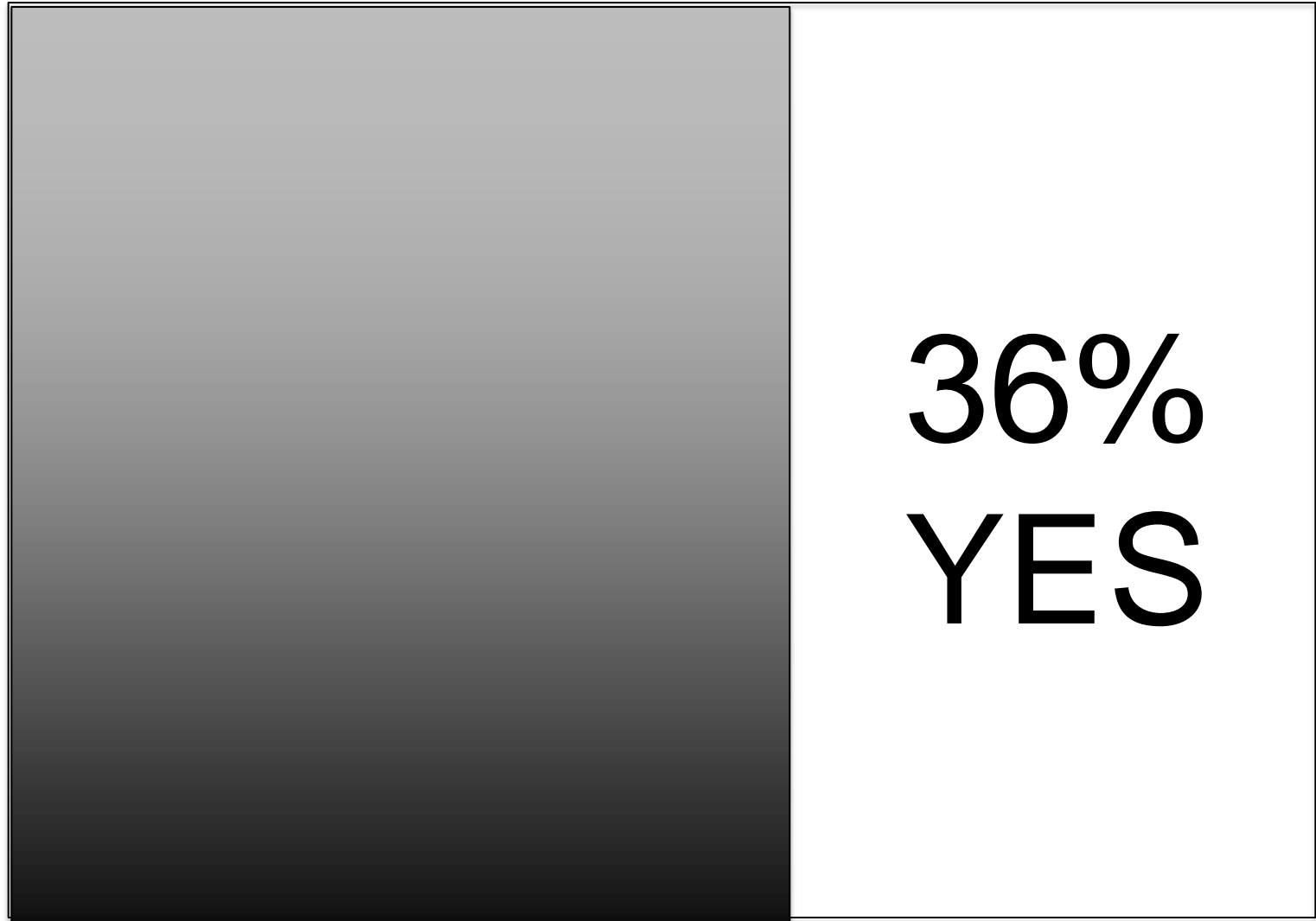


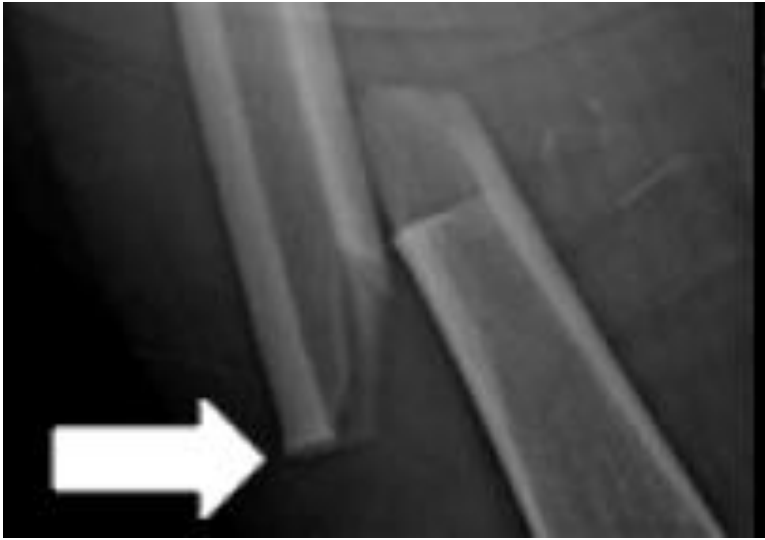


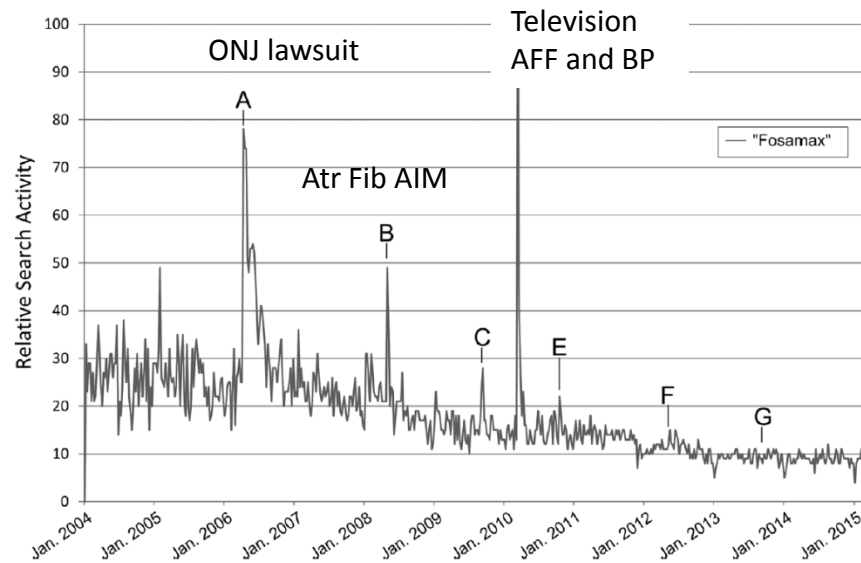
A post menopausal woman who has already had a fracture after the age of 45....

*Is your risk higher compared with women of the same age without a fracture?*

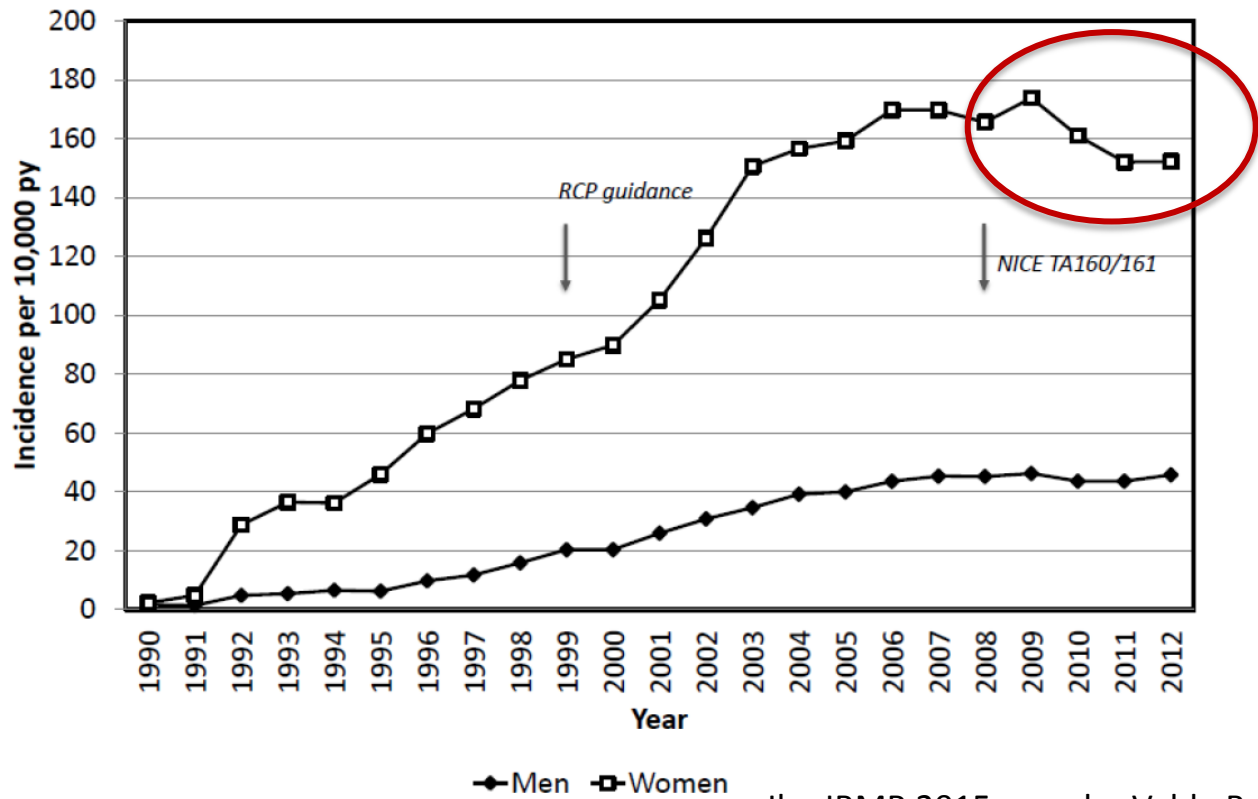
# Low awareness of osteoporosis and fragility fracture in the UK







## UK Incident Use of Alendronate

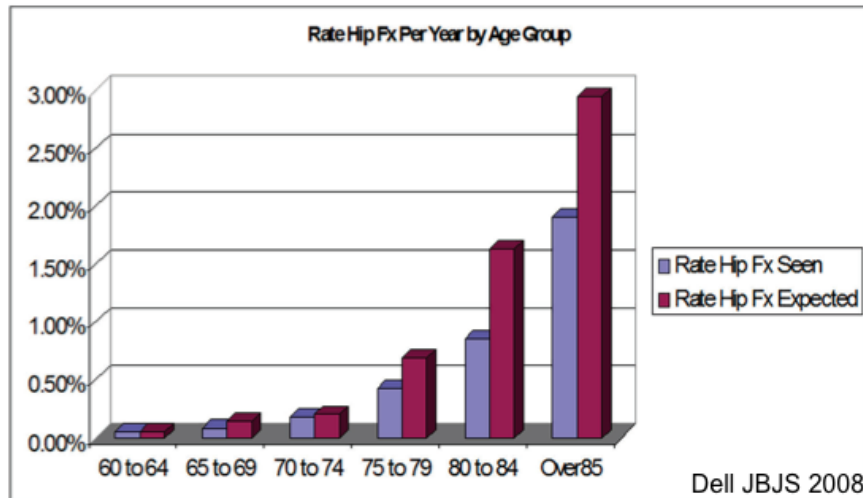


# Isn't effectiveness obvious?

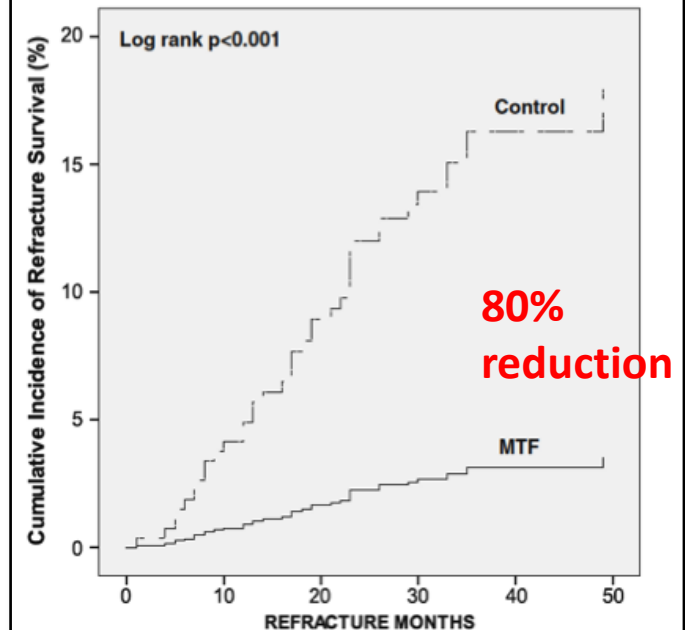
- Kaiser Southern California HMO

- All > 50 yr + fracture
- All > 60 y
- Assessed
- Treated
  - Drug
  - Falls
  - Education

**37%  
reduction  
in hip  
fracture**



## Concord results



**80%  
reduction**

Lih OI 2011



# Regional Evaluation of Fracture Reduction Services after hip Fracture (REFRESH)

Andrew Judge

M Kassim Javaid, Cyrus Cooper, Nigel Arden, Dani Prieto-Alhambra,  
Andrew Farmer, Janet Lippett, Rachael Gooberman-Hill, Jose Leal, Jasroop Chana,  
Alastair Gray, Michael Goldacre, Laura Graham, Sam Hawley, Sally Sheard, Sarah Drew

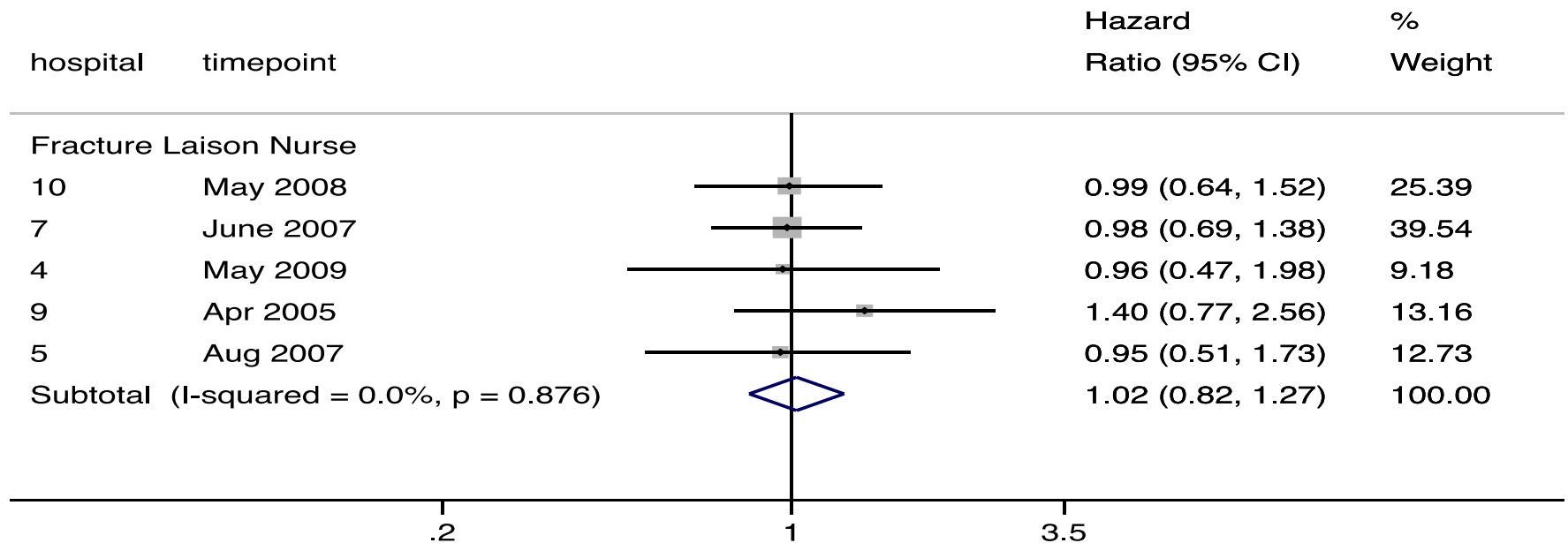
# Hospital coding: Primary hip fractures at 11 hospitals

## What was the effect of FLS on re-fracture rates?

Hospital	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
1	255	252	298	304	341	367	344	321	347	286	3,115
2	413	380	376	374	431	375	403	386	422	384	3,944
3	178	185	183	90	199	241	205	217	179	181	1,858
4	133	165	248	330	300	341	335	327	327	313	2,819
5	198	172	165	158	171	183	189	190	209	202	1,837
6	62	69	80	94	109	22	125	105	131	233	1,030
7	583	580	543	583	662	550	584	601	622	587	5,895
8	488	473	487	472	527	529	504	464	510	483	4,937
9	189	201	194	204	158	209	211	210	202	216	1,994
10	400	412	427	435	412	400	416	404	476	436	4,218
11	142	152	135	134	173	151	160	176	154	129	1,506
Total	3,041	3,041	3,136	3,178	3,483	3,368	3,476	3,401	3,579	3,450	33,153

# Findings: second fracture within 2-years before and after FLS implementation

Forest plot of Hazard Ratios for 2-year secondary hip fracture, by type of change in service delivery





Unable to detect a change in hip re-fracture rates  
after introduction of an FLS with over 33,000 hip fractures

Observational study:  
Before/ after time series design

Hip fractures – “too late”

Qualitative study–  
“Adherence is a major issue”

No FLS delivered monitoring

**Services pre-dated  
FLS standards**

Not every FLS is automatically effective

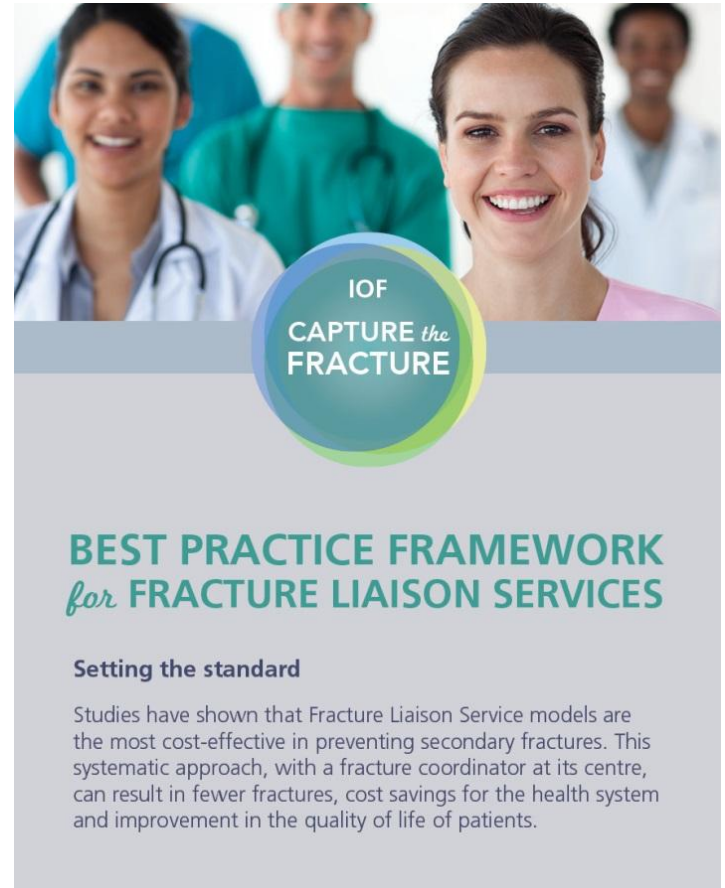
# IOF standards

## Aim:

1. Set the standard for FLS
2. Guidance
3. Benchmarking and fine-tuning

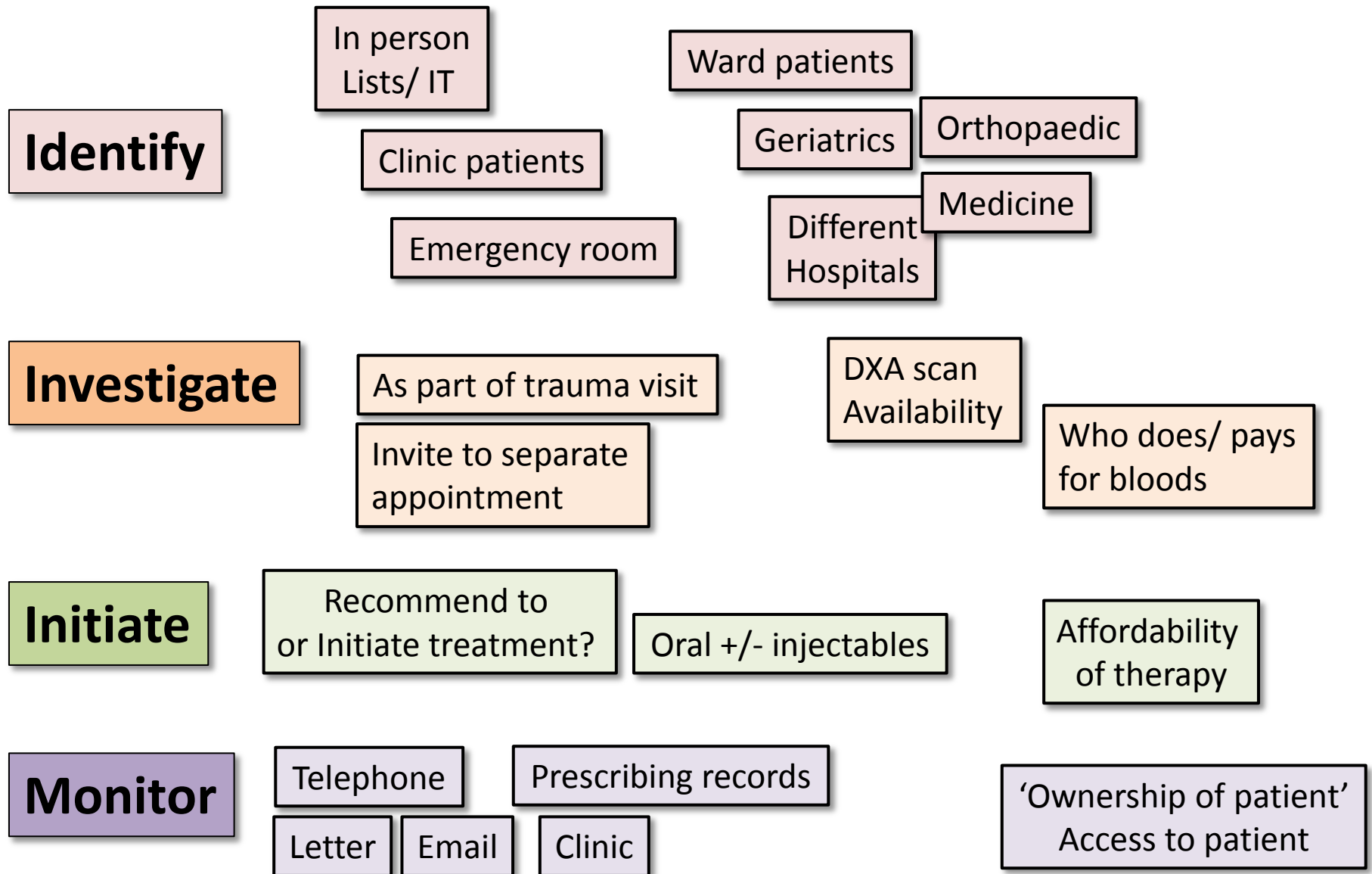
## 5 domains, 13 standards

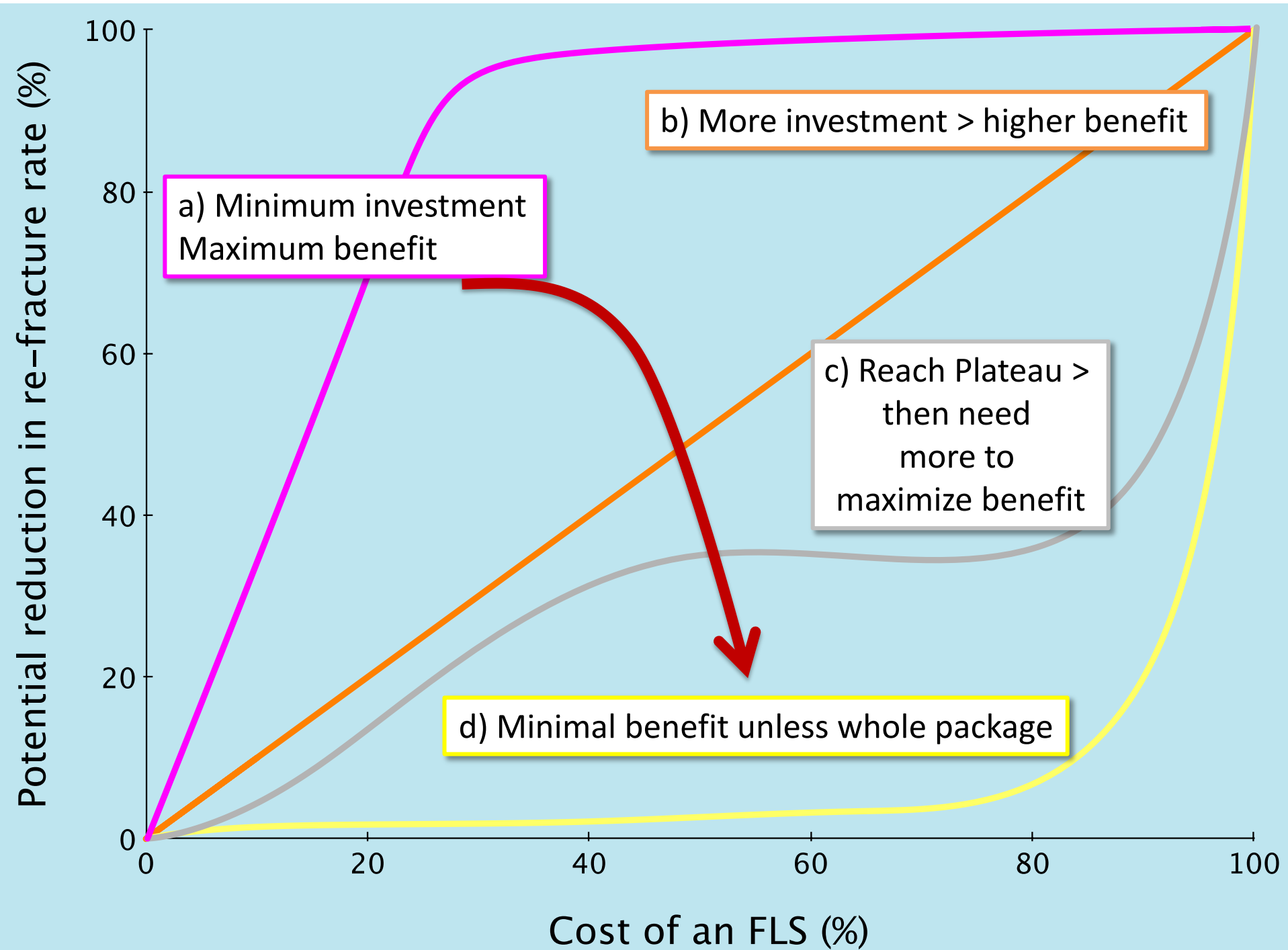
- Hip fracture patients
- Inpatient
- Outpatient
- Vertebral fracture patient
- Organization



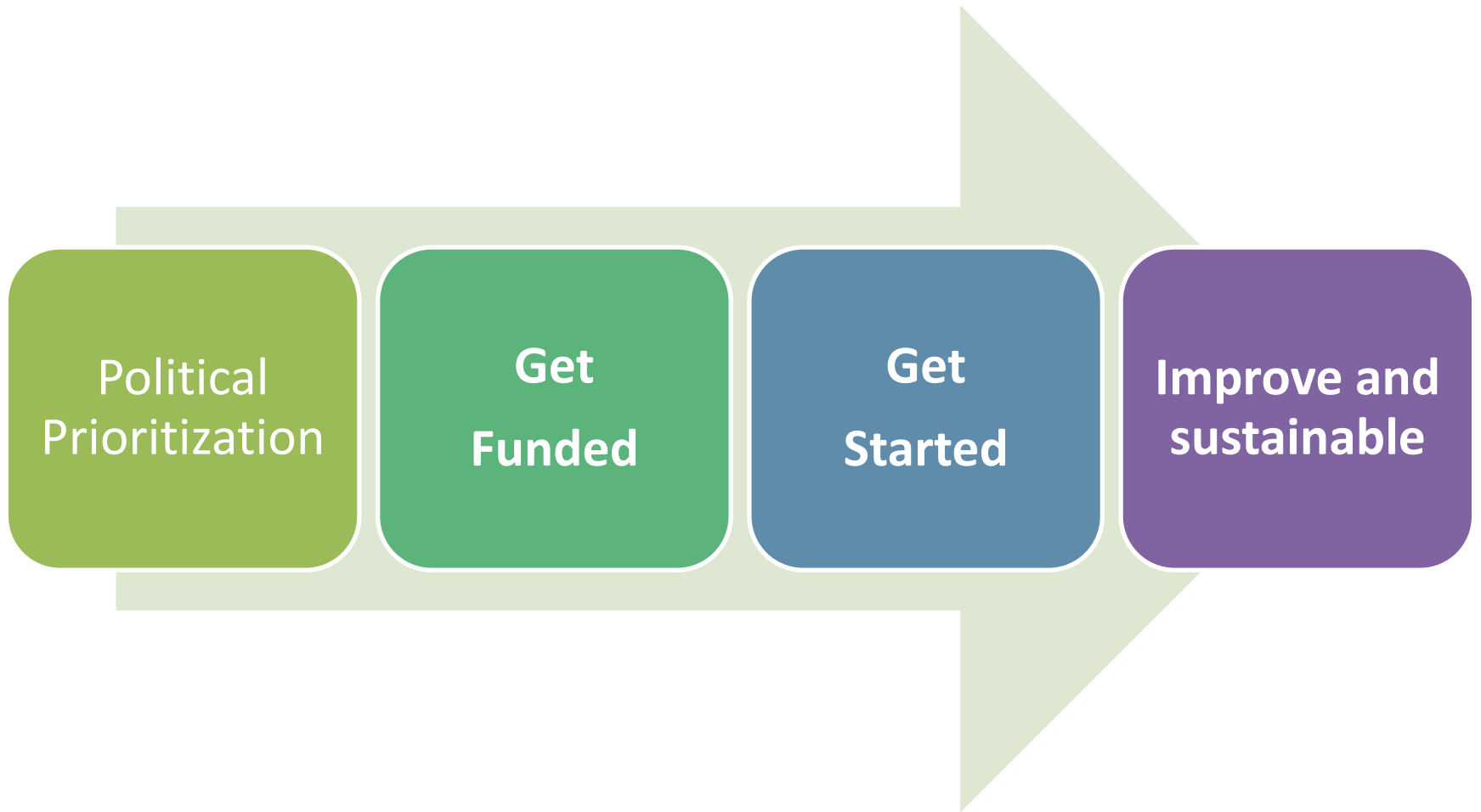


# Local decisions for an FLS > €€ vs. €€€€€€€€€€





# Key Steps in UK

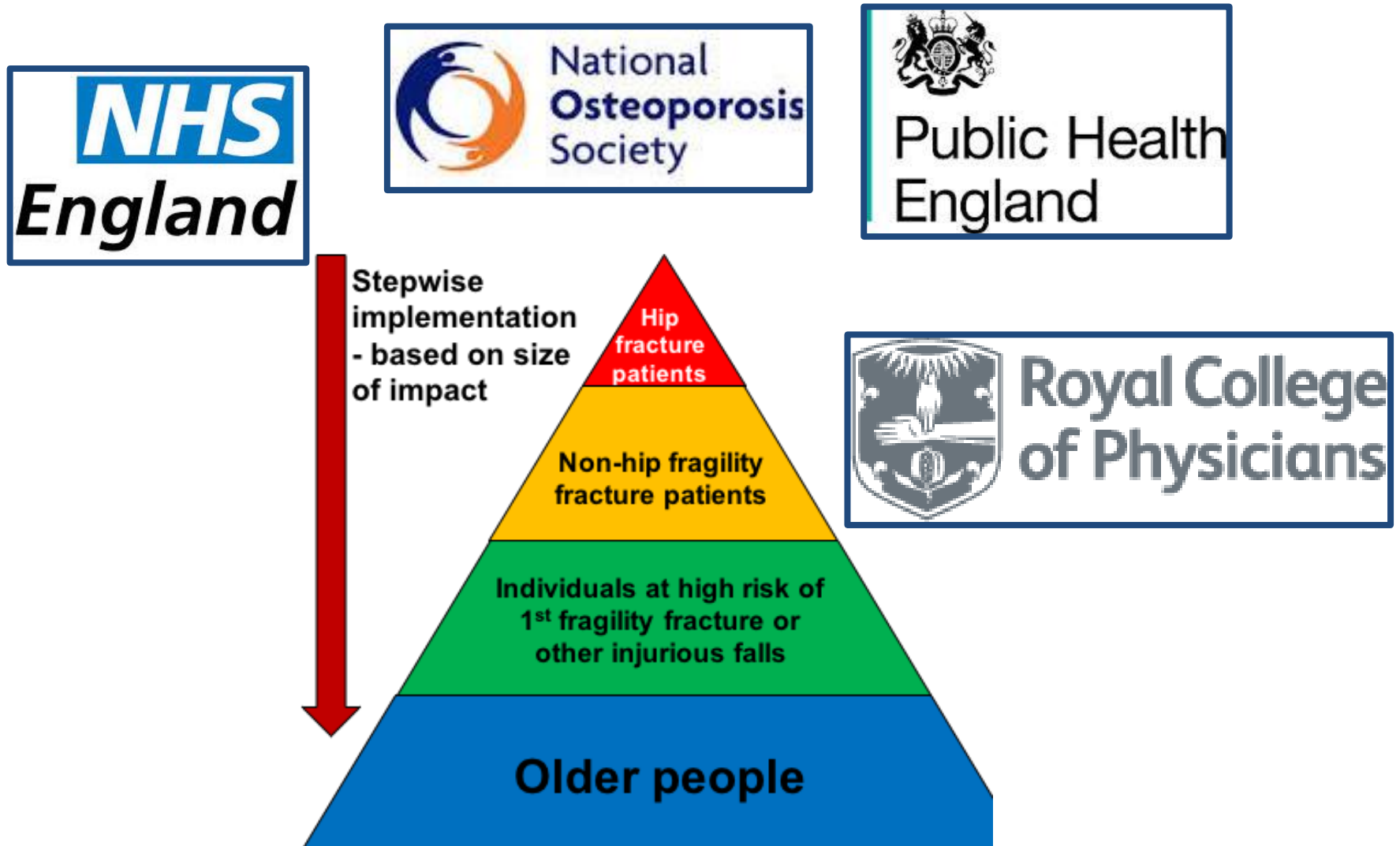




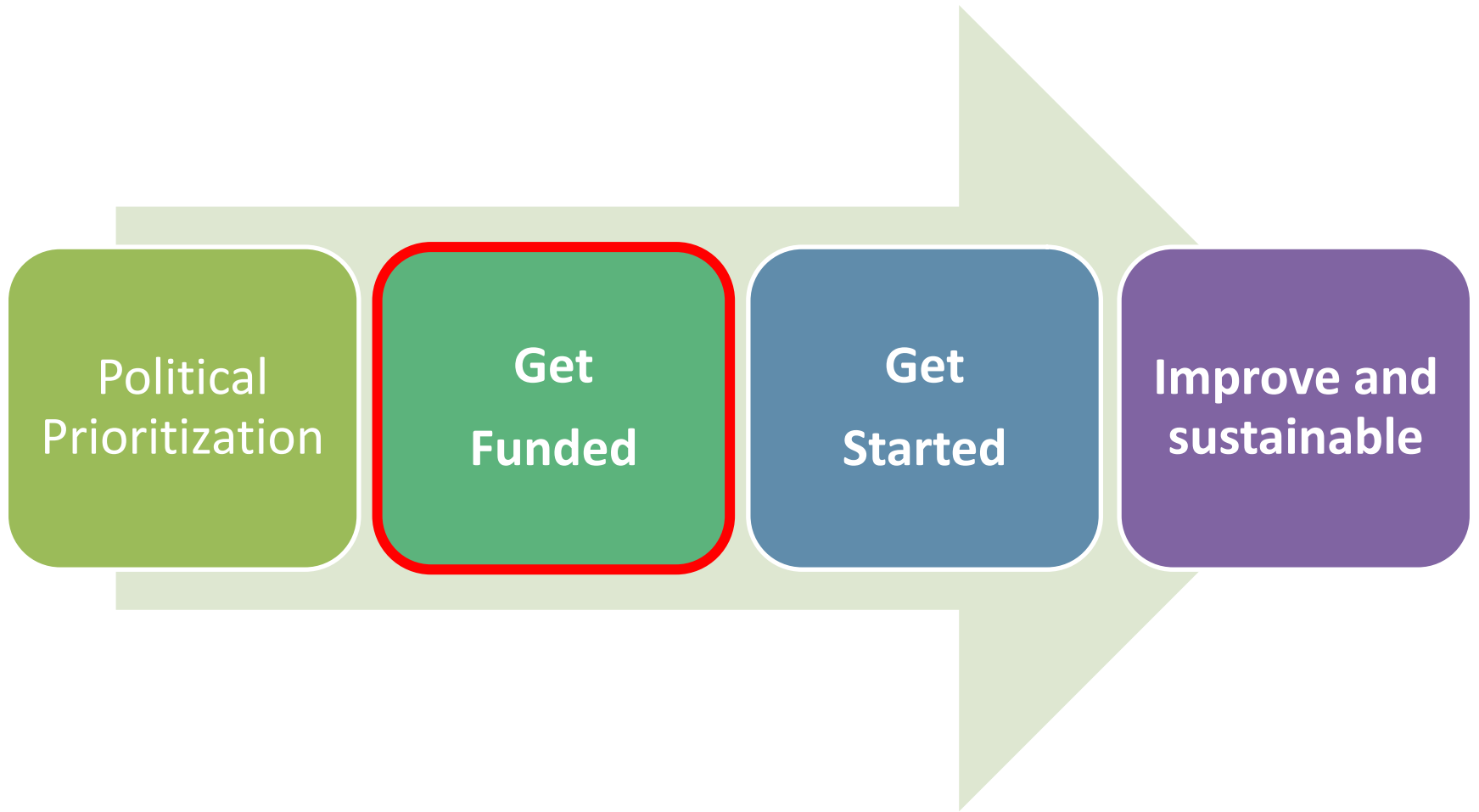
# Political Prioritization



Everyone had same message



# Step 2



# Who benefits vs. who pays?

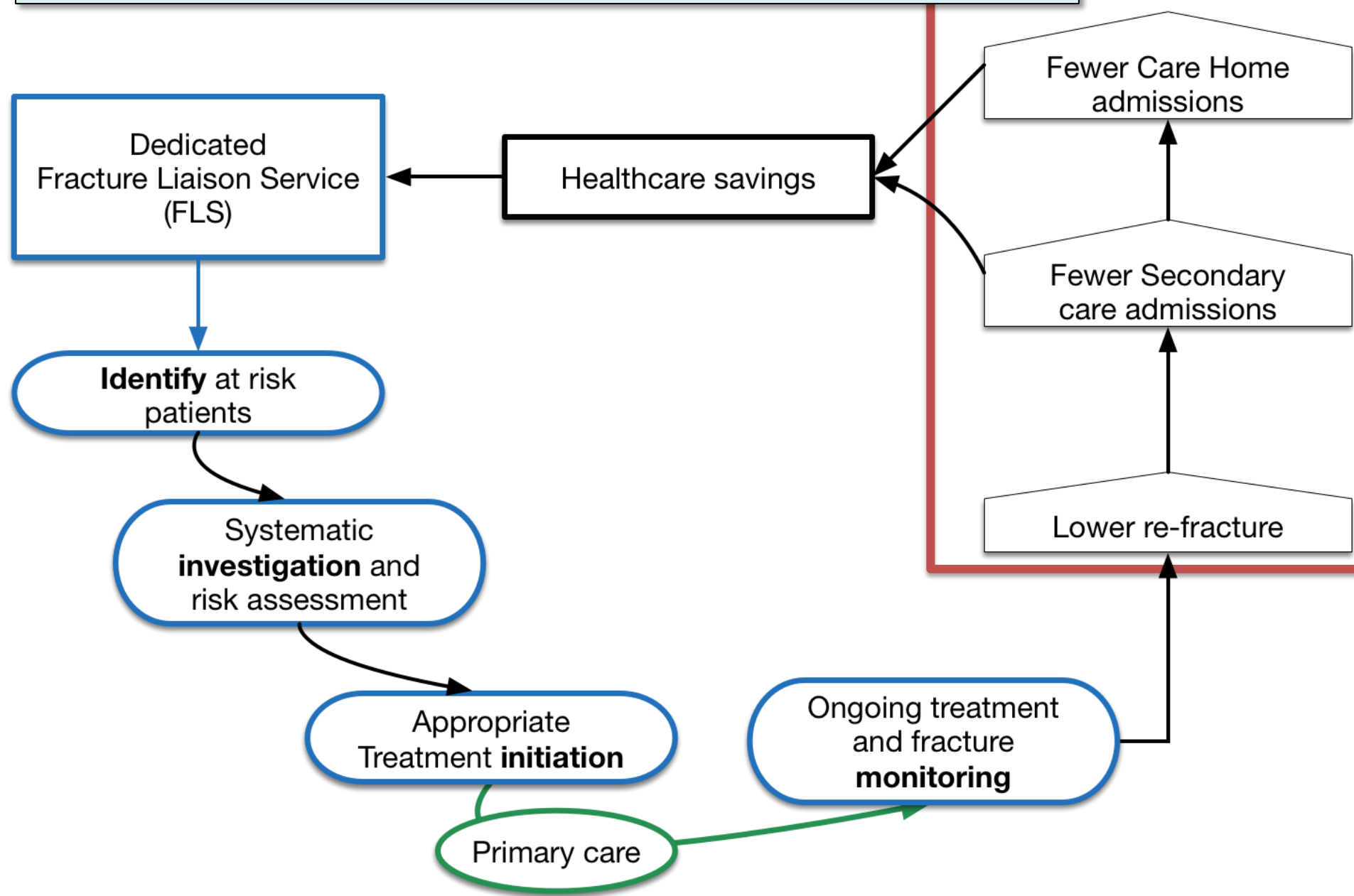
- Benefit
  - Community care / Social care
  - Patients and family
- Costs
  - Specific department in hospital
  - Lower emergency admissions / income
  - Regional health board

# The saving: 5 year Oxford model

- Population of 620,000

	Hip	Other inpatient	Outpatient	Vertebral	Total
Annual cases	622	695	2,414	555	4286
Proportion seen by FLS	95%	95%	85%	10%	
Number of fractures prevented after 5 years of FLS	288	152	152	97	629
Hospital savings at 5 years	£2,928,960	£172,064	£52,960	£314,862	£3,469,846
+ primary care/ social care/ community costs	£4,737,024	£210,064	£53,960	£336,784	£5,337,832

# The cost: How big should the FLS be?



# Identification is key

Fractured and attended at  
the Emergency Department

Captured by  
the system  
n = **1,674**

350 excluded:

- 68 deaths
- 89 trauma
- 141 bed-ridden or serious disease
- 52 other causes

Eligible  
n = 1,324

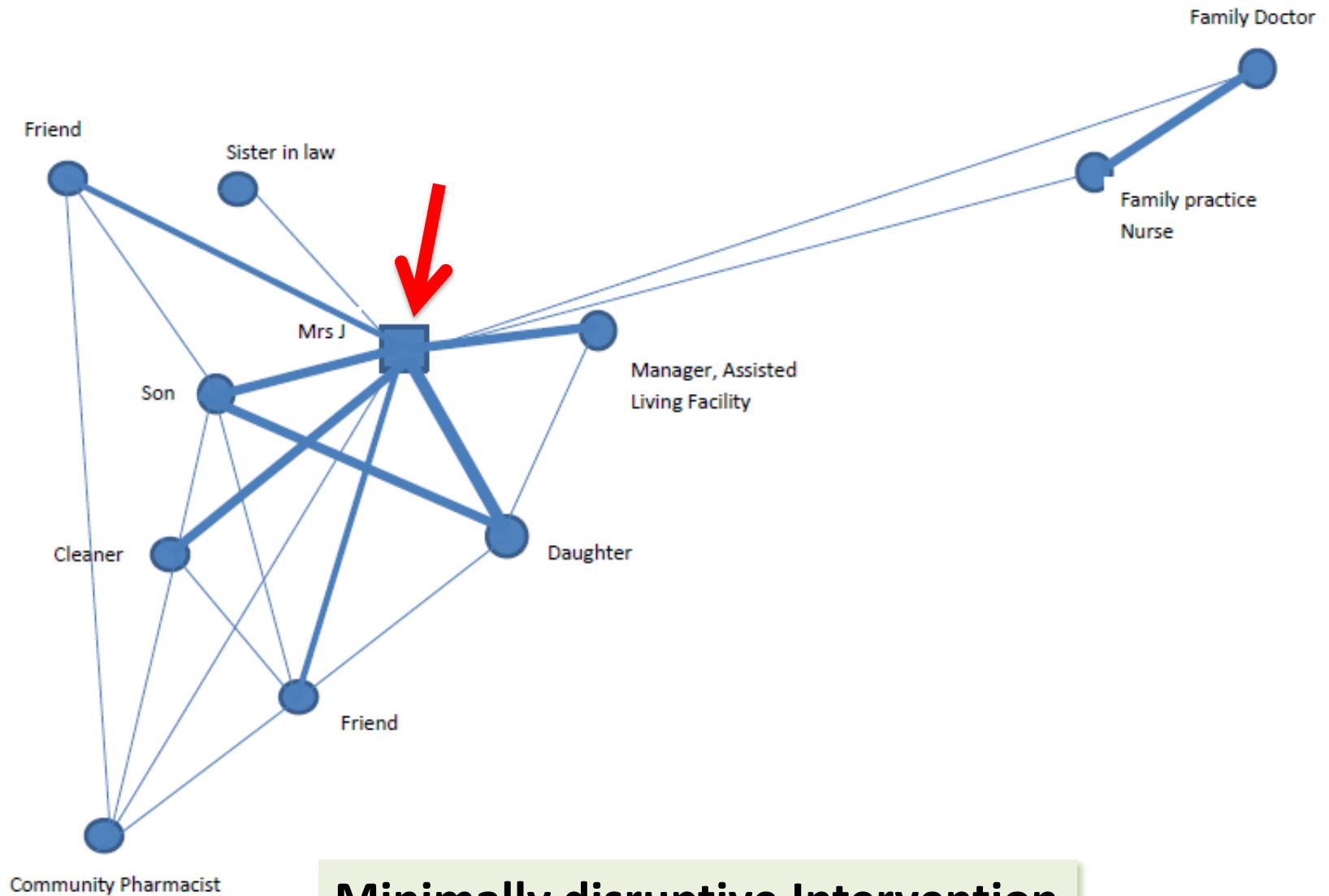
- 86 could not be located
- 46 already treated by specialist
- 441 declined participation

Entered the  
program  
n = **759 (57.3%)**

Prescribed an  
antiresorptive  
n = 549

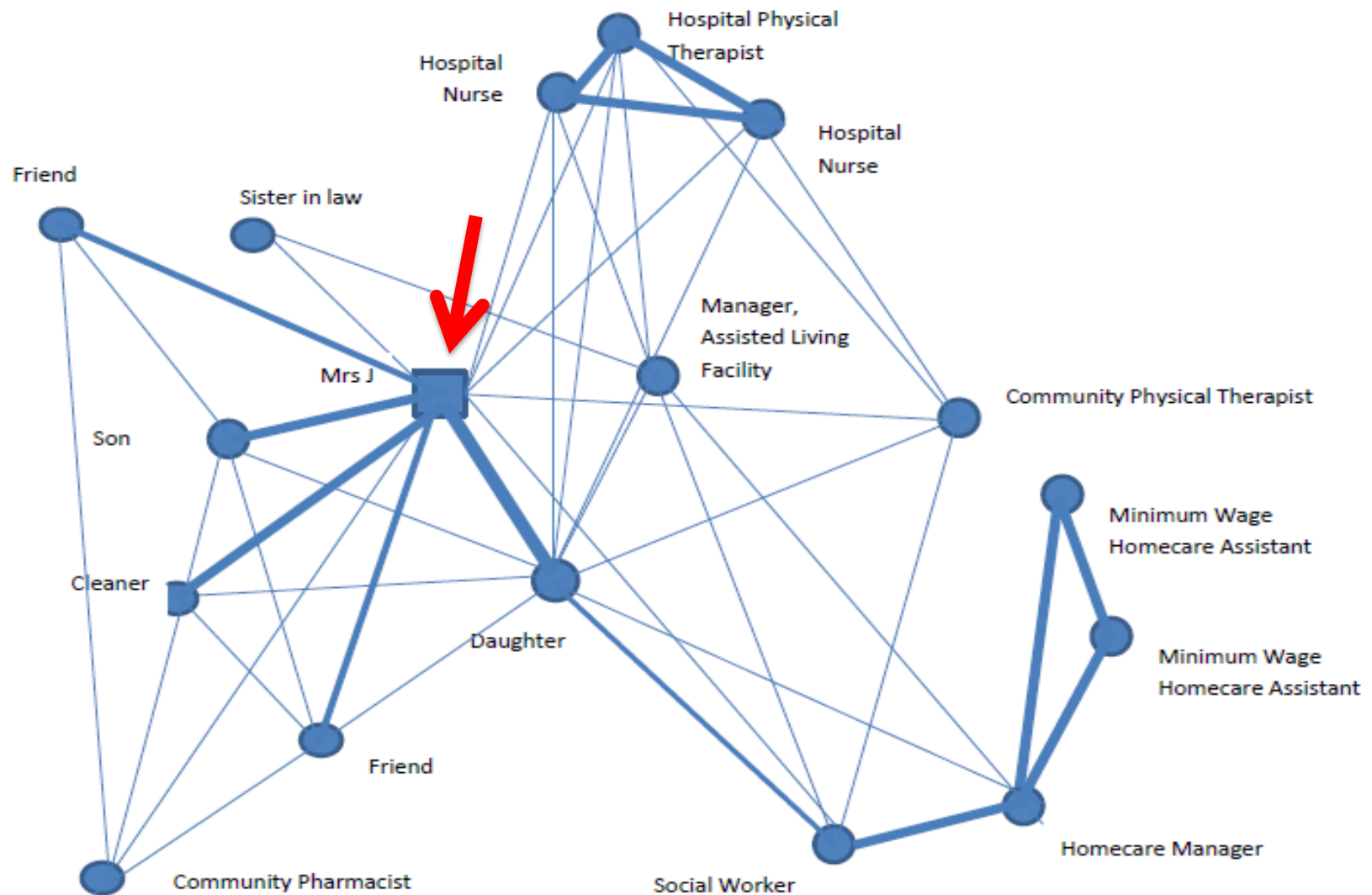
Need to find them all.

# 24 hours pre-hip fracture network



**Minimally disruptive Intervention**

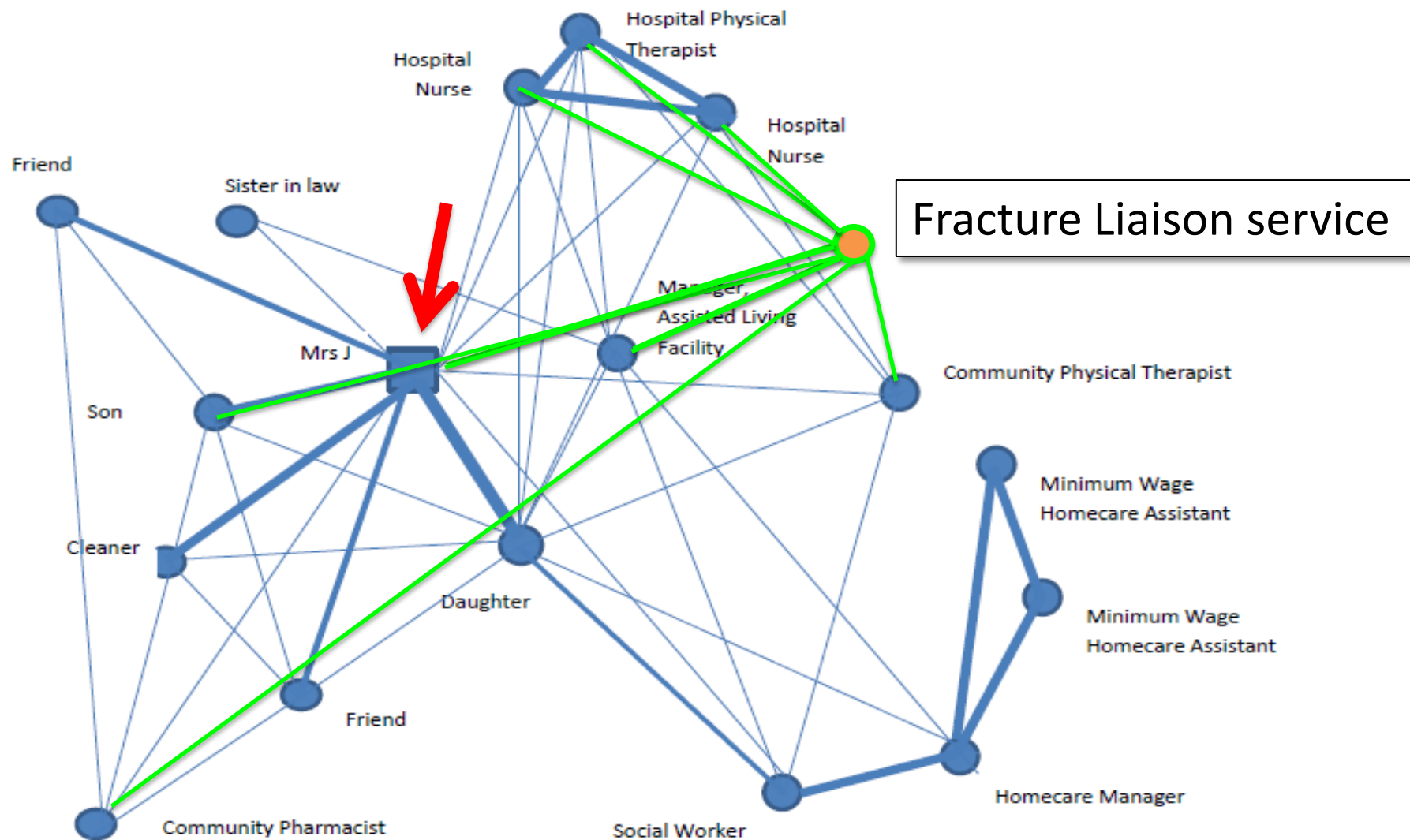
# 48 hours pre-discharge: having a fracture is a full time job



**Minimally disruptive Intervention**



# 48 hours pre-discharge: having a fracture is a full time job



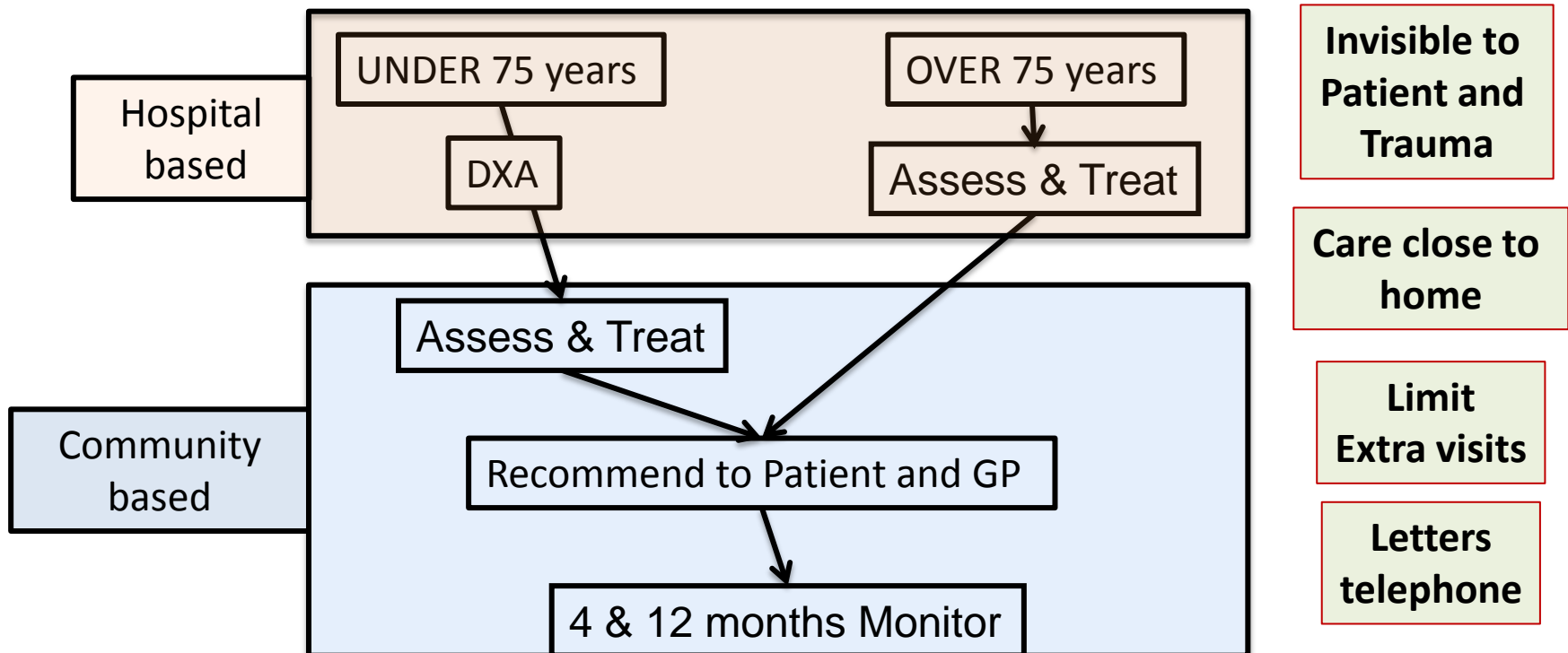
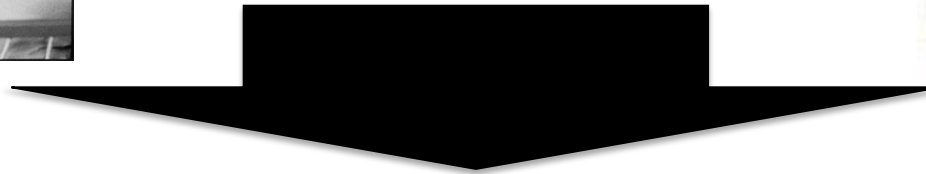
**Minimally disruptive Intervention**

# FLS: Minimally disruptive Intervention

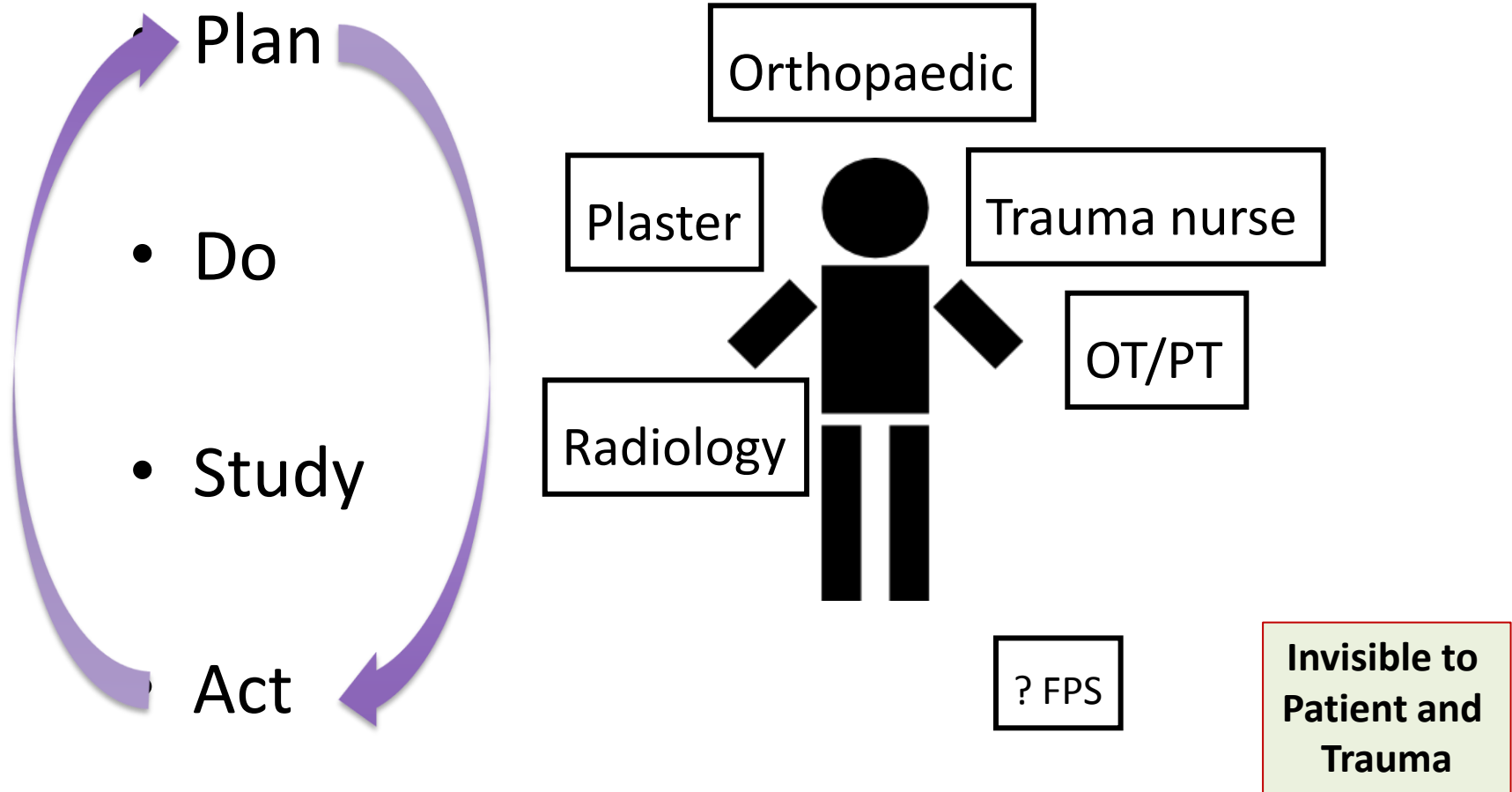


Trauma  
ward patient

Trauma  
clinic patient



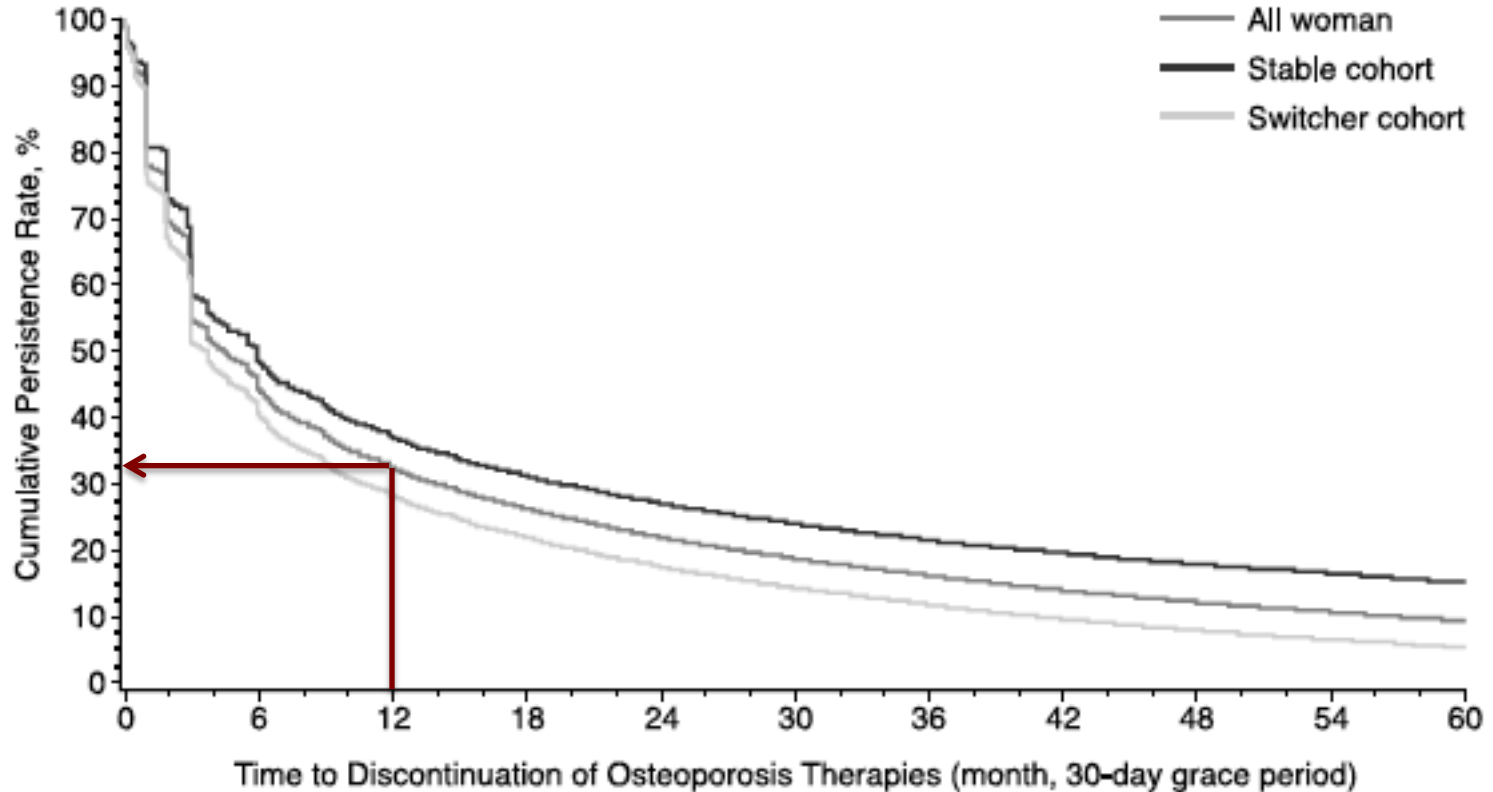
# PILOT – can it work in your hospital



# Monitoring

- Most important step

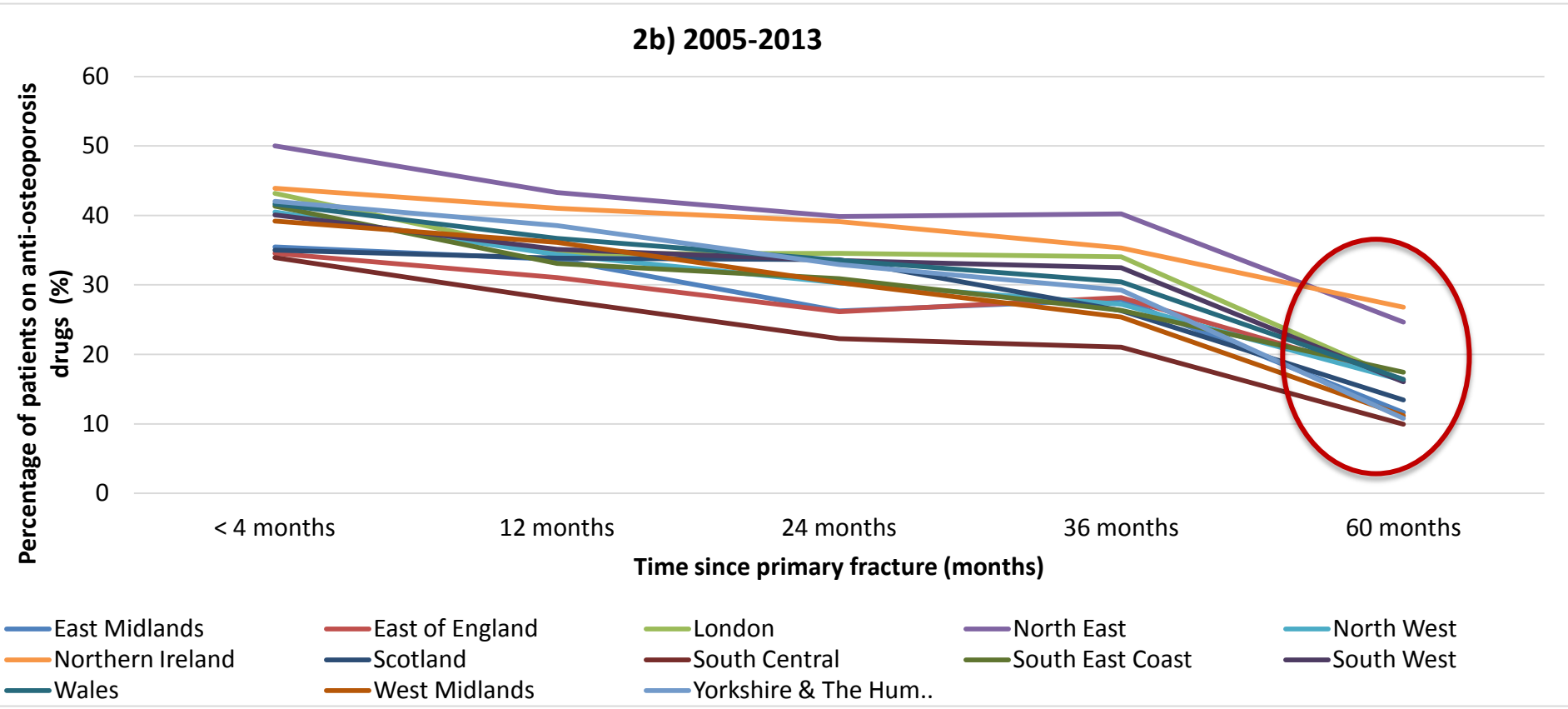
# Adherence matters: UK CPRD

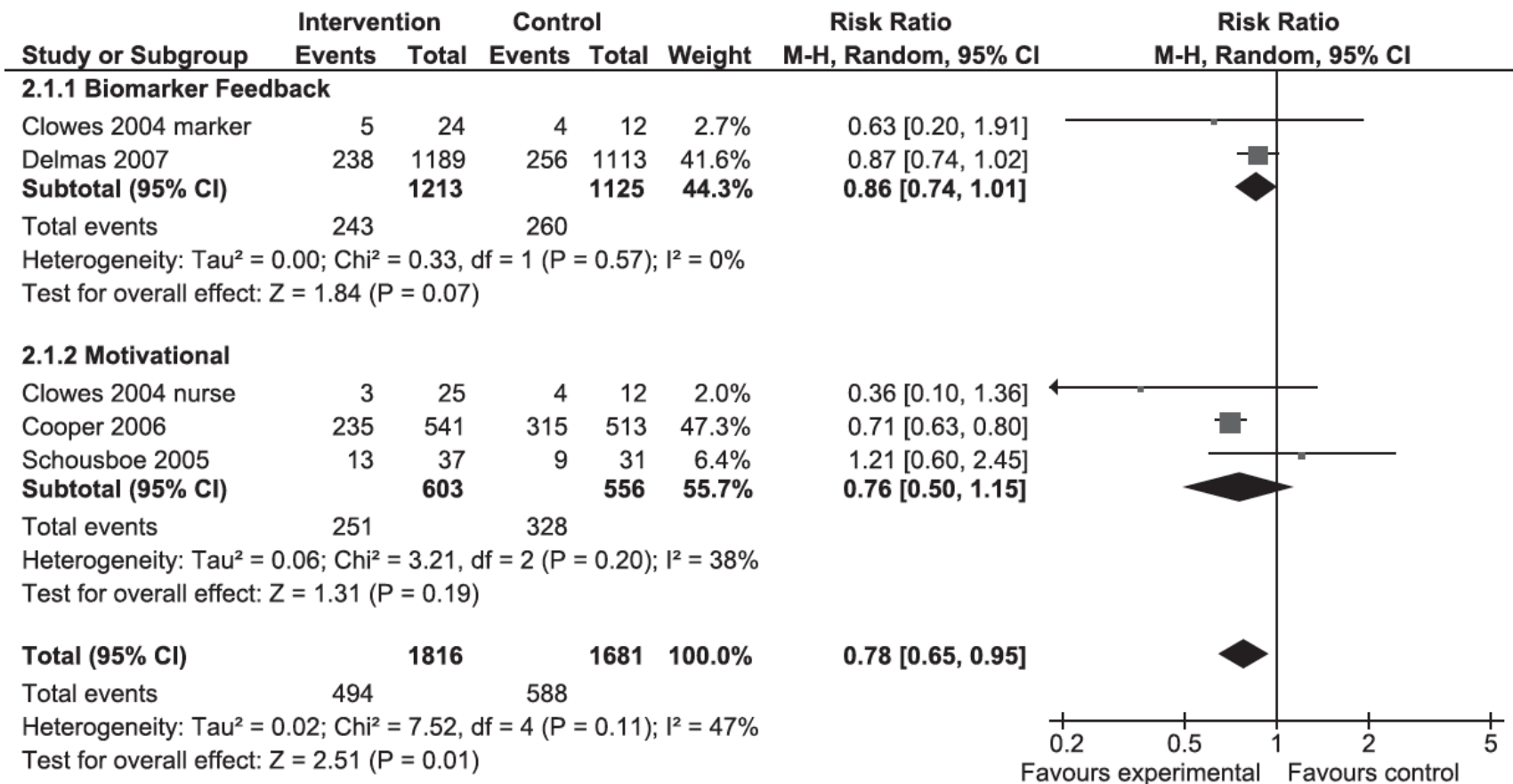


- 66,116 PMO women

# Prescriptions post hip fracture: UK CPRD

N= 13,069





Statistical but minimal clinical effect on adherence

# Poor adherence: then what?

- Non-adherence is no worse than other diseases.
- Minimal impact motivation
- Switch to intermittent parenteral therapy?

Zoledronate

Denosumab

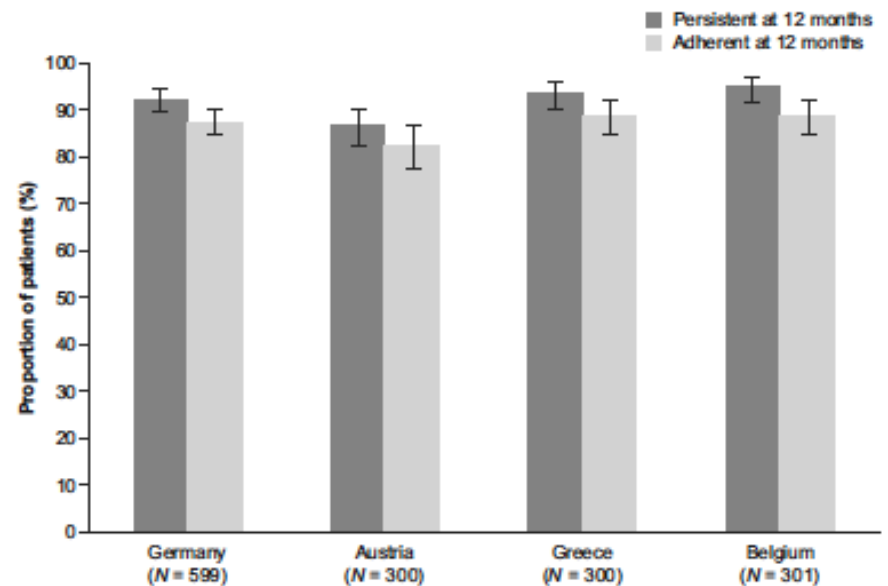


Fig. 1 Persistence with and adherence to denosumab at 12 months. Data are shown as percentage  $\pm$  95 % confidence interval. Persistence was defined as receiving the subsequent injection within 6 months  $\pm$  8 weeks of the previous injection. Adherence was defined as receiving two consecutive injections within 6 months  $\pm$  4 weeks of each other



# UK Key performance indicators

- Meaningful
- Measurable
- ~~• Fracture rates~~
- ~~• Re-fracture rates~~
- Time to first monitoring visit
- Number and % on anti-osteoporosis medication at 4 and 12 months
- Starting exercise within 4 months

.....from date fracture diagnosed in NHS



Instructions for use: We recommend you follow the 6 steps detailed below in order to develop your business case. To complement or improve your current service, you may wish to consider a maximum flexible approach to a maximum of 100% of the local population.

## Step Two

### Fracture Liaison Service Implementation Toolkit - Improvement Project Plan

#### Tasks

Commissioning organisation

[Enter here]

Provider organisation

[Enter here]

Project name

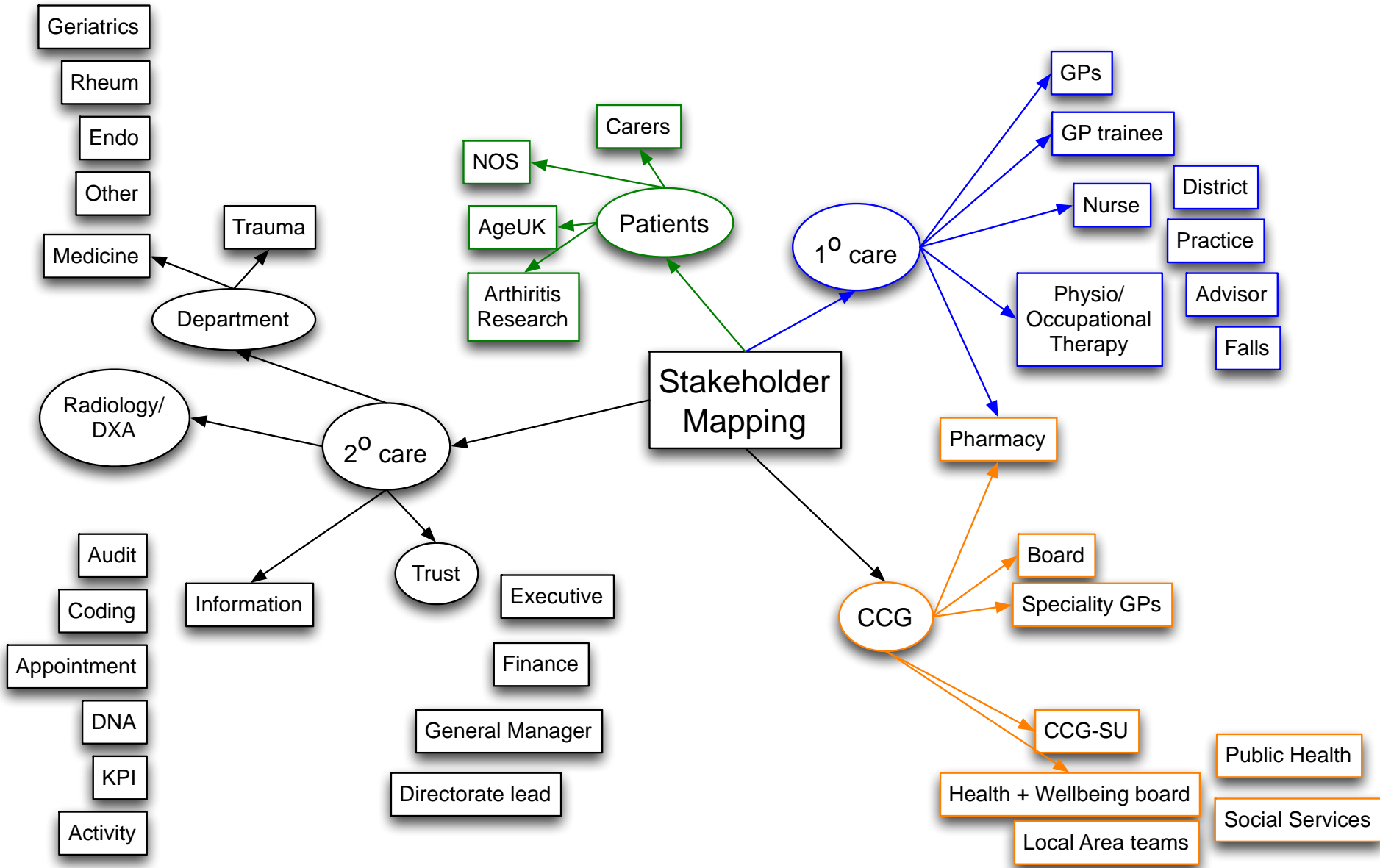
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Date

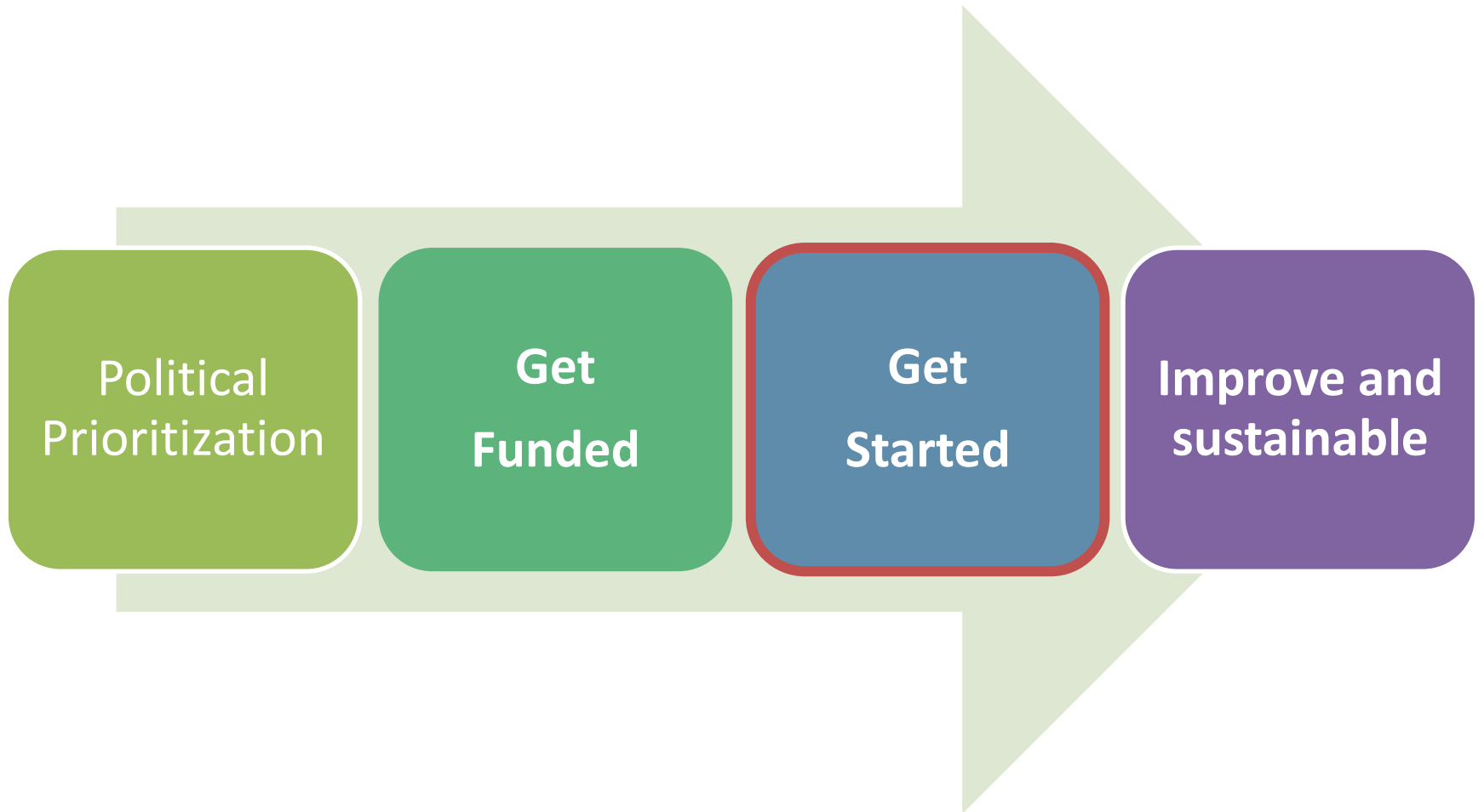
[Enter here]

Phase	Task	Sub task	Ref	Lead	Complete by	Comments/notes	Date completed
2. Define and scope	Scope the current service	[add new sub-task here]					
		Process map care pathway					
		Process map the patient journey					
		Describe current service including areas for improvement					
		Circulate document for consultation					
		Amend documents following stakeholder comment					
	Identify information needs	[add new sub-task here]					
		Identify information needed to understand current demand					
		Identify information needed to understand future demand					
		Identify information needed to understand costs of service					
3. Measure and understand	Understand need / demand for service	[add new sub-task here]					
		Request information identified in phase 2					
		Identify skilled support to carry out analysis					
		Carry out analysis of need / demand					
	Estimate capacity required	[add new sub-task here]					
		Request information identified in phase 2					
		Identify skilled support to carry out analysis					
		Carry out analysis of capacity required					
	[add new task here]	[add new sub-task here]					
		[add new sub-task here]					
		Finalise care pathway					
		Finalise service model					

# Oxford stakeholder map



# Step 3



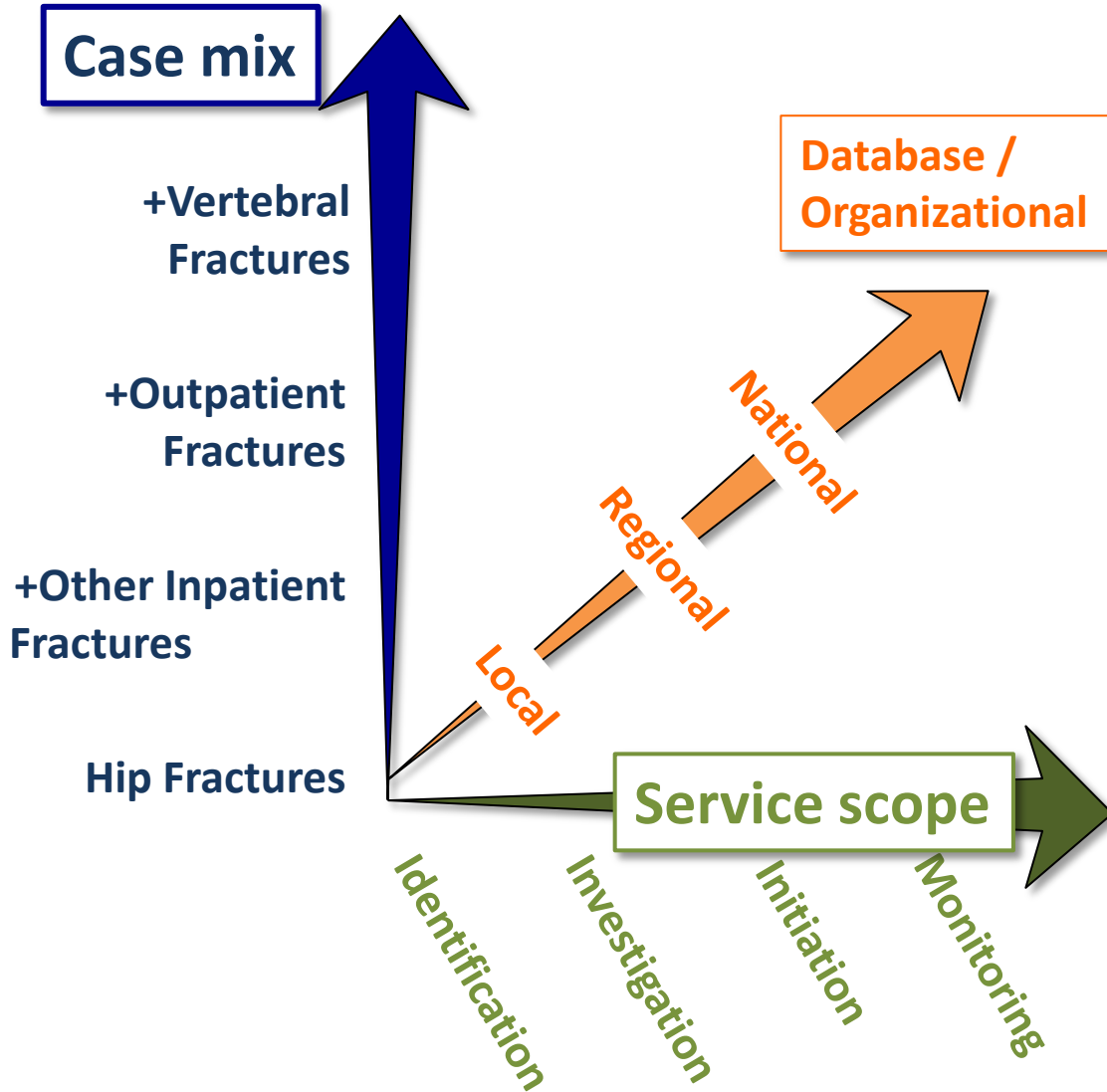
staged implementation

Set up core service

Widen case mix

Collect outcomes

# Staged implementation



# 0 – seeing patients

1. Job banding, hours, start/ end date
2. Vacancy control forms
3. Adverts & Short listed
4. Interview panel
5. Notice
6. Contracts
7. Occupational health
8. Induction / FPP
9. Mandatory training
10. Apprenticeships

The longer you take to start  
the shorter the time  
to demonstrate outcomes

6 month project manager  
Work with Local Patient group

# Make sure your team are trained



## Fracture Prevention Practitioner certification

- Foundation and Advanced
- Launch @ NOS 2014
- Web based podcast and assessment

### Introduction

#### Module 1 (Foundation) - Epidemiology of Osteoporosis

- Section 1 – Definition
- Section 2 – Incidence
- Section 3 – Risk Factors

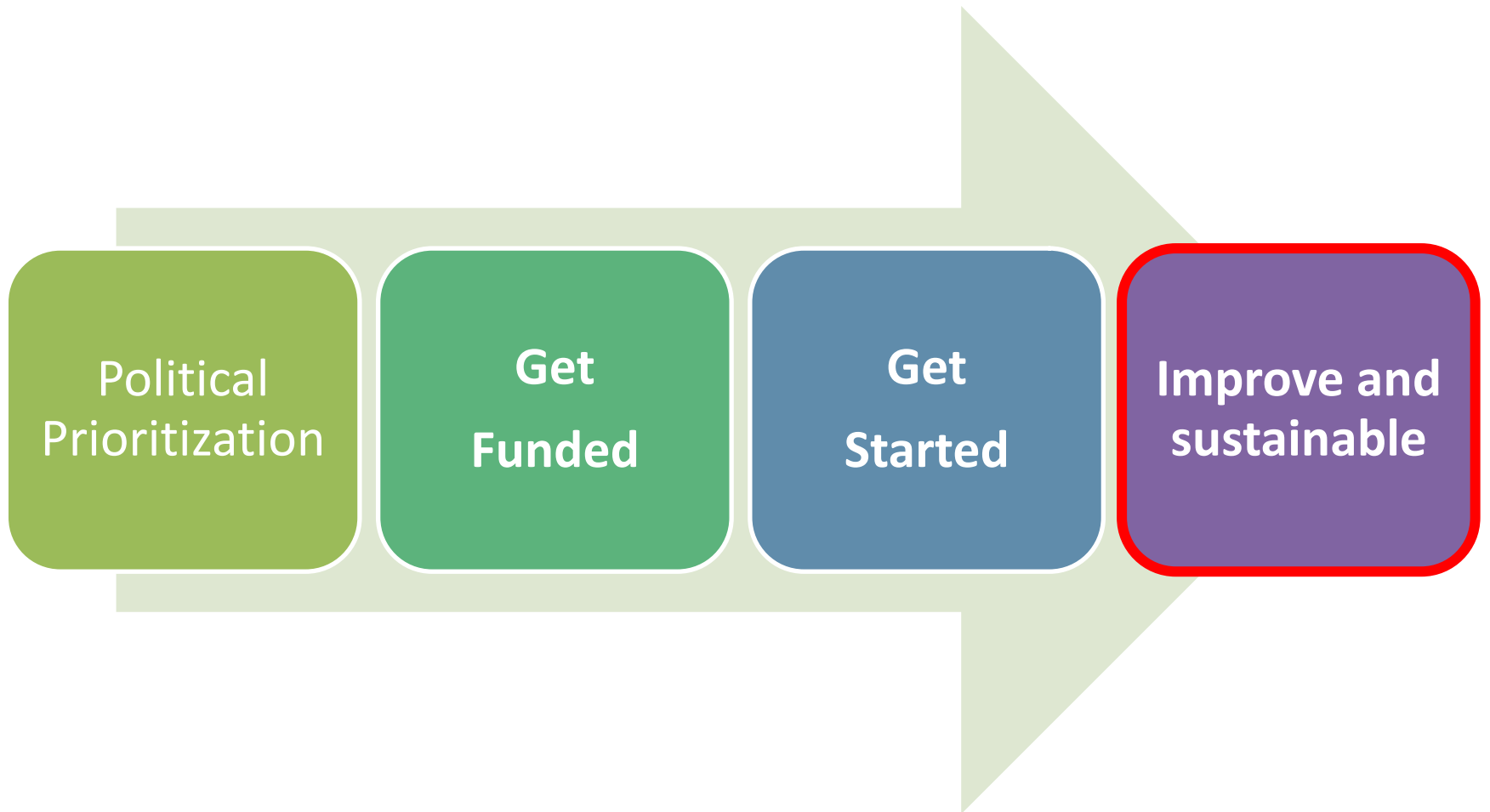
#### Module 2 (Foundation) – Fracture Risk Assessment

- Section 1 – Fracture Risk Assessment Tools
- Section 2 – Nutritional Assessments
- Section 3 – Bone Density Scanning (DXA)
- Section 4 – Impact of Osteoporosis on the Body





# Aims





FLS should perform



Royal College  
of Physicians

Fracture Liaison Service  
Database (FLS-DB)

FLS does perform

# Process

- FLS-DB Facilities audit
- The FLS-DB audit – patient centred

## Fracture Liaison Service Database (FLS-DB) facilities audit

FLS breakpoint: opportunities  
for improving patient care  
following a fragility fracture

May 2016

### Key recommendations

Service providers and commissioners (or local health boards (LHBs)) should use the data in this report to review local performance and inform quality improvement. This will require collaboration and these data should form a basis for discussion to inform and improve services.

#### For commissioners and LHBs

- **Commissioning** – clinical commissioning groups (CCGs) and LHBs should ensure that an effective FLS is part of its care pathway for secondary prevention of all fragility fracture groups.
- **Caseload** – CCGs and LHBs should ensure that FLSs are commissioned to identify and treat all fracture groups such as hip fracture inpatients, other (non-hip) fracture inpatients, outpatient-treated fracture patients and vertebral fractures.

#### For existing FLS providers

Services should review their current service to identify any gaps and variations in secondary fracture prevention and then take the necessary steps to address these issues.

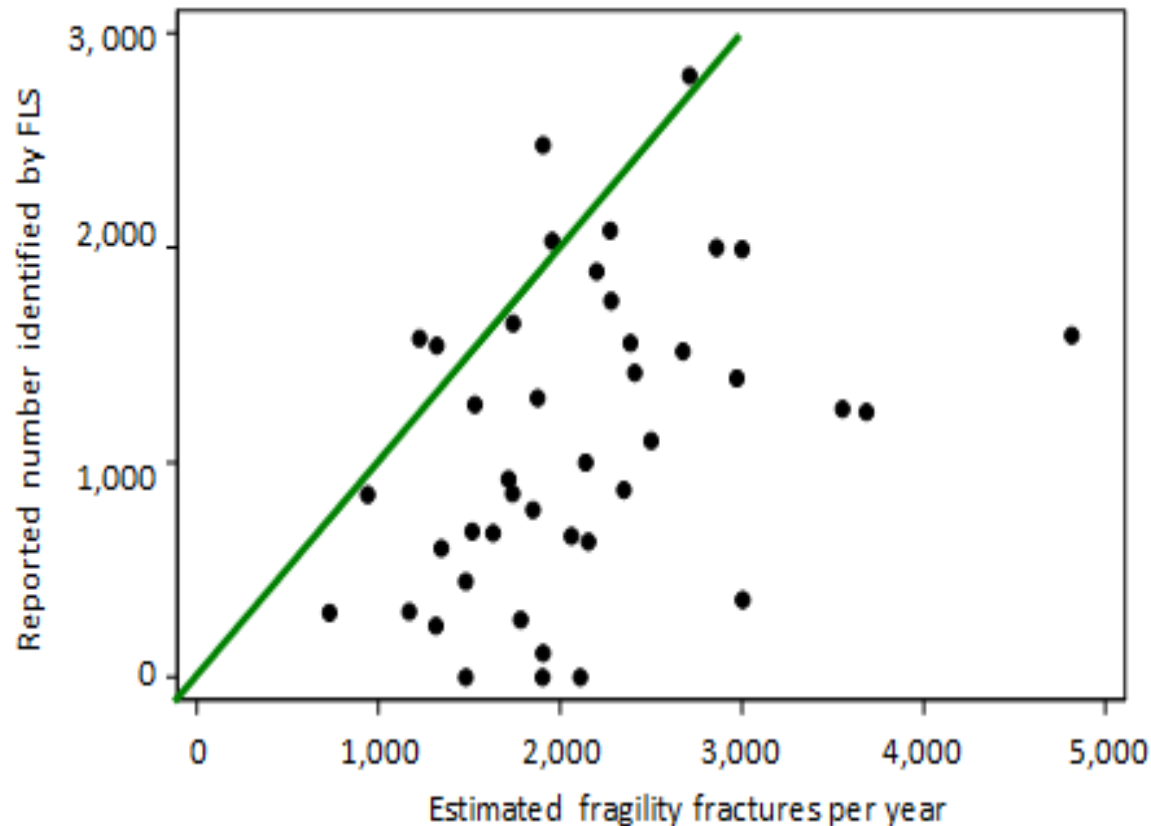
- **Identification** – FLSs should ensure that there is a process to identify all patients aged 50 years and over with a new fragility fracture, including hip fracture patients and those with newly reported vertebral fractures.
- **Bone health** – FLSs should ensure that all fragility fracture patients are assessed and receive treatment for bone health in line with NICE guidance.<sup>4,5,6</sup>
- **Falls assessments** – FLSs should link with local falls prevention services to ensure that falls assessments are performed in line with NICE guidance, and ensure rapid access to strength and balance classes that deliver the evidence-based 50 hours of supervised exercise.<sup>7,8</sup>
- **Information** – FLSs should ensure that core items (such as risk factors for bone health and falls and fracture risk score) are included in communications within different parts of the NHS, including primary care, and with patients.
- **Monitoring** – FLSs should ensure that there are clear local arrangements for monitoring patients who are recommended drug therapy; these should occur within 4 months of the fracture to check successful uptake, and every 12 months to check and encourage adherence to the treatment plan. Pathways for monitoring should be agreed and responsibility for ongoing review should be specified and audited.

In association with:



Commissioned by:

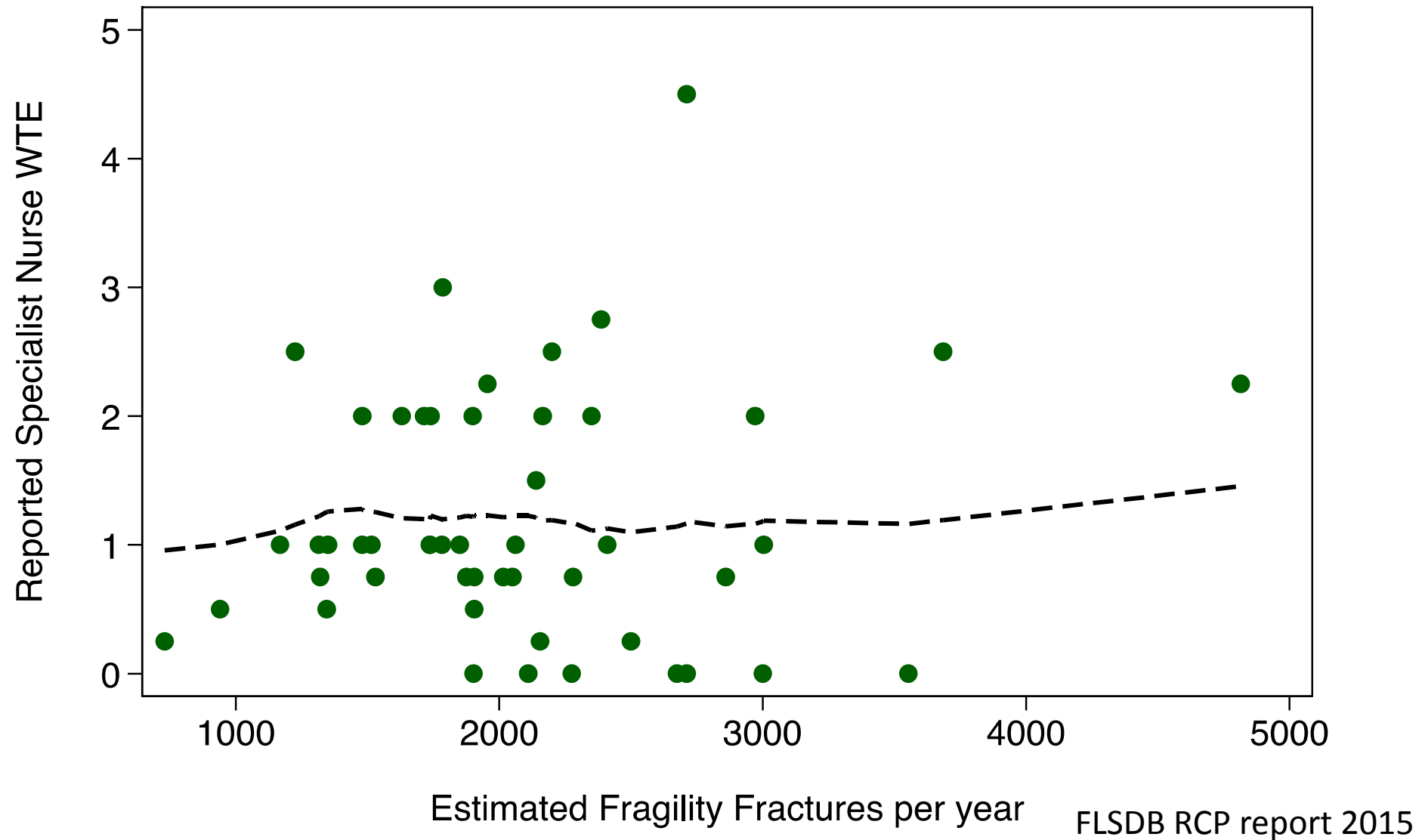
## Reported number of patients identified by FLS (n=52) vs estimated fragility fracture caseload



Most FLSs did not see as many patients as expected:

- 24% FLS >80% estimated caseload
- 57% LFS < 50% caseload

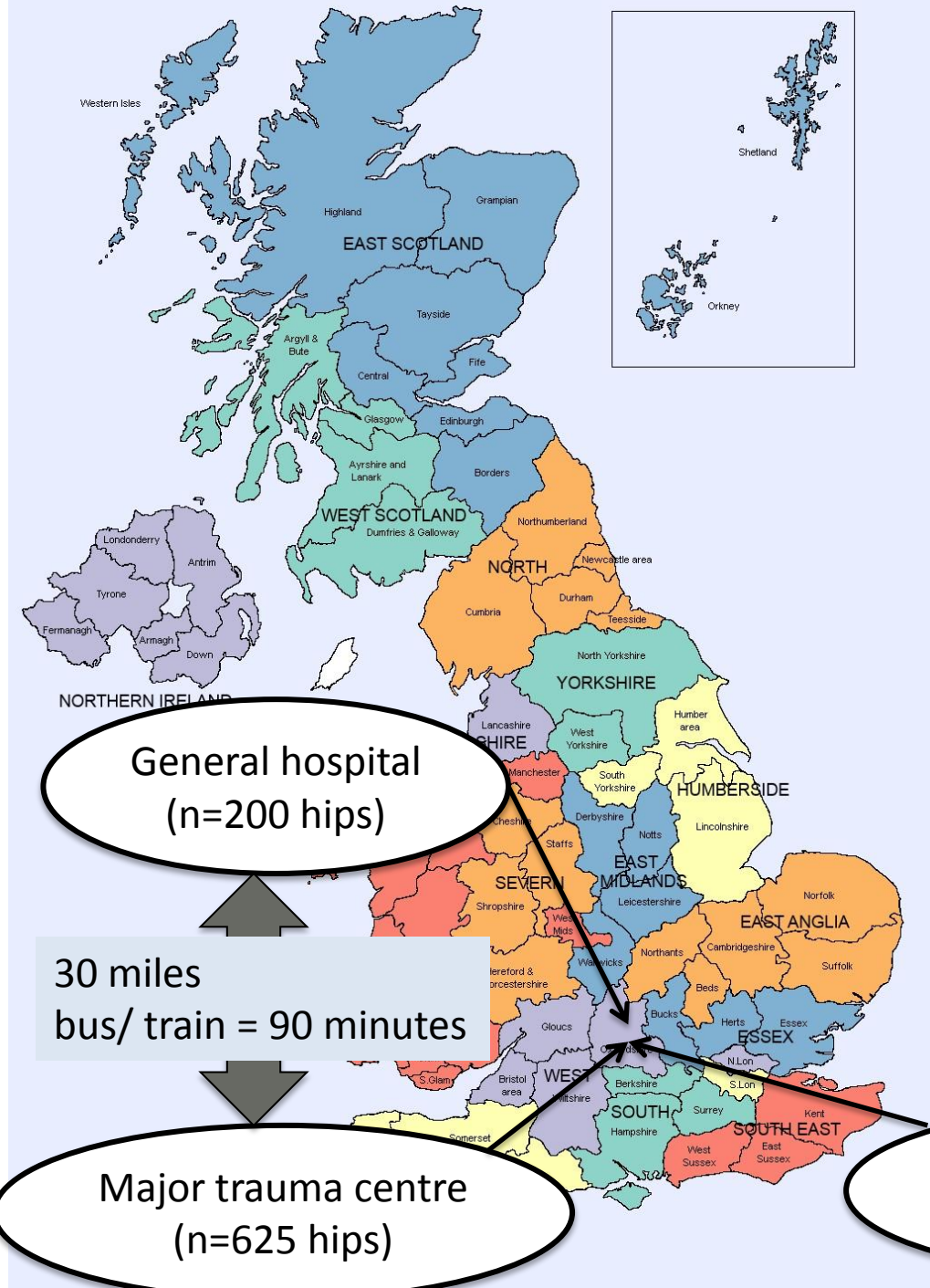
## Service structure: FLS nurse time and Estimated fragility fractures



# Investigation: Standard panel?

	England FLS n	England FLS %	England non FLS n	England non FLS %	Wales FLS n	Wales FLS %	Wales non FLS n	Wales non FLS %
Renal function tests	41	85.4	19	73.1	4	100.0	1	25.0
Serum Calcium	40	83.3	18	69.2	4	100.0	1	25.0
Liver function tests	38	79.2	18	69.2	4	100.0	1	25.0
Full blood count	37	77.1	19	73.1	2	50.0	1	25.0
Serum alkaline phosphate	37	77.1	17	65.4	4	100.0	1	25.0
Serum phosphate	37	77.1	15	57.7	4	100.0	1	25.0
Thyroid function	37	77.1	16	61.5	4	100.0	1	25.0
Serum 25OH vitamin D	36	75.0	16	61.5	3	75.0	1	25.0
Erythrocyte sedimentation rate / ESR Liver function	29	60.4	9	34.6	1	25.0	1	25.0
Coeliac disease screen	28	58.3	6	23.1	3	75.0	1	25.0
Serum Electrophoresis for myeloma screen	27	56.3	15	57.7	4	100.0	1	25.0
Serum Parathyroid hormone	26	54.2	12	46.2	3	75.0	1	25.0
Testosterone/ Sex hormone binding globulin	24	50.0	9	34.6	4	100.0	1	25.0
C-reactive protein	20	41.7	11					
Other	16	33.3	6					
Missing	6	12.5	6					
24 hour urinary calcium	3	6.3	2					
Spot urinary calcium	3	6.3	1					

Test	England (n=48)	Wales (n= 4)
Renal function tests	41 (85.4%)	4 (100%)
+ Serum Calcium	40 (83.3%)	4 (100%)
+ Serum phosphate	37 (77.1%)	4 (100%)
+ Serum alkaline phosphate	36 (75.0%)	4 (100%)
+ Liver function tests	36 (75.0%)	4 (100%)



# Oxford 3 hospital

General hospital  
(n=200 hips)

30 miles  
bus/ train = 90 minutes

Major trauma centre  
(n=625 hips)

Specialist Orthopaedic  
(DXA)



# Real time data

 **Royal College of Physicians**

FFFAP **Fracture Liaison Service Database (FLS-DB)**

Home | Patient Views | Reports | Import Data | Export Data | Downloads | Support

Muhammad Kassim Javaid / **John Radcliffe Hospital** Logout

Patient Record at John Radcliffe Hospital

Close Save

Patient	Investigation	DXA	Initiation	Assessment	Follow-up 12-16	Follow-up 48-56	Additional fractures
---------	---------------	-----	------------	------------	-----------------	-----------------	----------------------

**1. Patient identification**

Artemis ID

1.01

Fracture Liaison Service or site name Oxfordshire Fracture Prevention Service

1.02

Forename

# Real time data

## Report for Oxfordshire Fracture Prevention Service

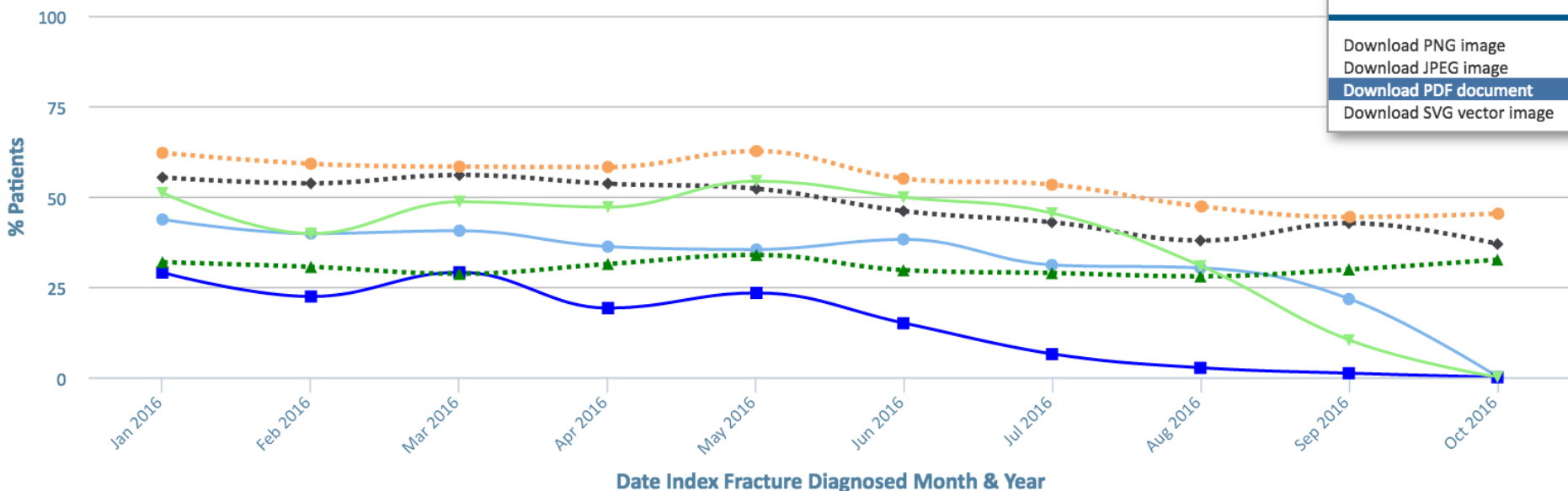
Print chart

Download PNG image

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Download PDF document

Download SVG vector image



● Patients offered a DXA %    ◆ DXAs offered National %    ■ Patients offered/referred for falls risk assessment %    ▲ Falls assessment National %  
 ▲ Patients offered Bone Protection medication %    ● Bone Protection Meds National %

Chart data is indicative status only - © Royal College of Physicians - Technology by Crown Informatics (ID: Main)

About this chart | How to used this chart

Records entered by Index Fragility Fracture(s) - Date diagnosed (data item 1.12)

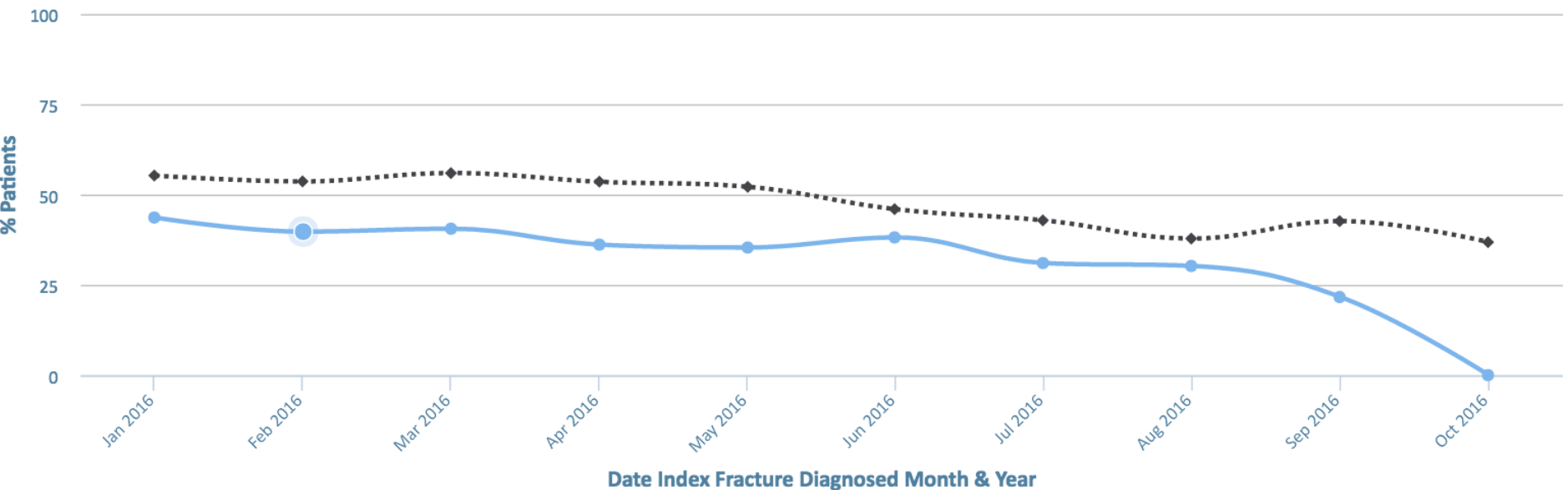
2016 Total = 1773

Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
220	189	227	219	249	189	203	189	88	0	0	0

Last Updated: 17/10/2016 17:41

# Real time data

## Report for Oxfordshire Fracture Prevention Service



[Patients offered a DXA %](#)  
 [DXAs offered National %](#)  
 [Patients offered/referred for falls risk assessment %](#)  
 [Falls assessment National %](#)  
 [Patients offered Bone Protection medication %](#)  
 [Bone Protection Meds National %](#)

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[out this chart](#) | [How to used this chart](#)

Records entered by Index Fragility Fracture(s) - Date diagnosed (data item 1.12)

**2016 Total = 1773**

Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
220	189	227	219	249	189	203	189	88	0	0	0

Last Updated: 17/10/2016 17:41

# Real time data

## Report for Oxfordshire Fracture Prevention Service

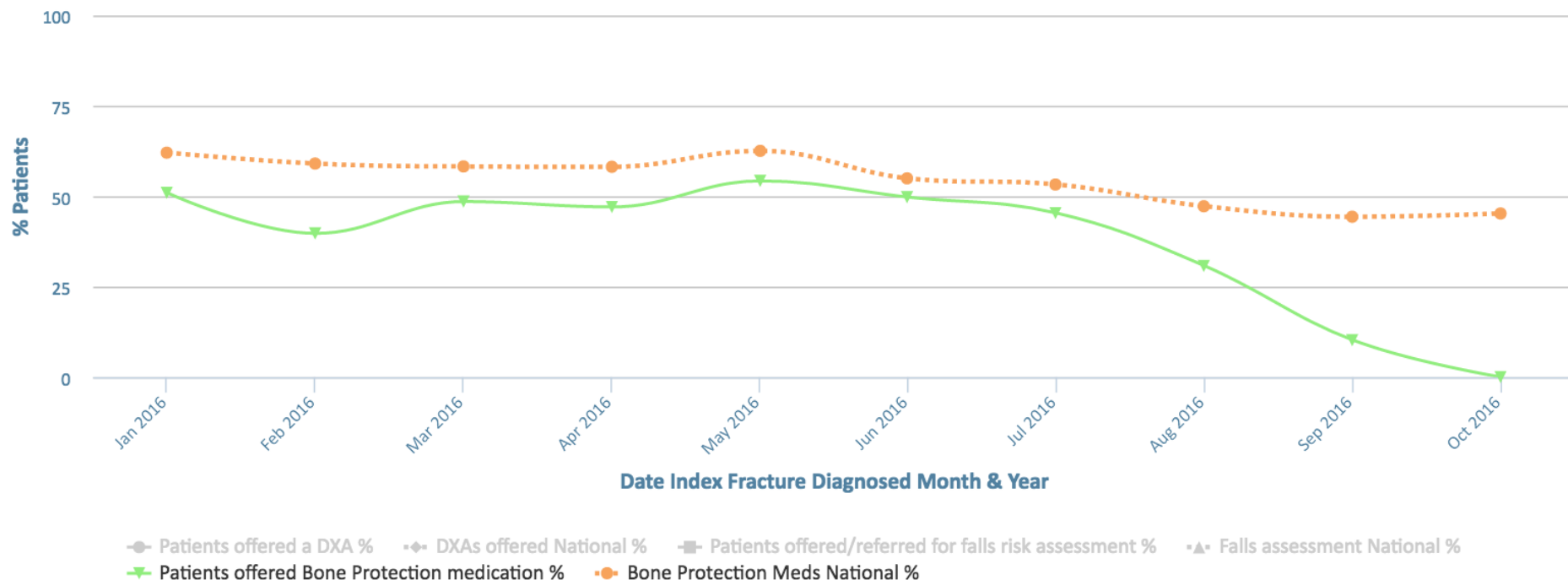


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[About this chart](#) | [How to used this chart](#)

Records entered by Index Fragility Fracture(s) - Date diagnosed (data item 1.12)

**2016 Total = 1773**

Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
220	189	227	219	249	189	203	189	88	0	0	0

Last Updated: 17/10/2016 17:41



**A work in progress....**

# Management: more than osteoporosis medication

- Paracetamol
  - Tramadol
  - (NSAIDS)
  - Opioid patches (3 days)
- 
- Bowel care
  - Physiotherapy
  - Interventional radiology

# Translation to patient care

13% of vertebral fractures are not reported by radiologists<sup>1</sup>

35% of reports are noted by clinicians and alter patient care<sup>2</sup>

Vertebral fractures are the single most preventable fracture with current therapies (60 – 90%)<sup>3</sup>

<sup>1</sup>Williams Eur J Rad 2009, <sup>2</sup>Freedman Spine J 2008, <sup>3</sup>Freemantle OI 2013

# Oxford audit

732 hip fracture patients

157 had previous imaging

65/157 had vertebral fracture(s)

45/65 (54%) not reported

30/65 (46%) mentioned in report





# Strategy

- Training
- Audit
- Staged introduction
- Feedback



[ABOUT US](#)

**WHAT WE DO**

[OSTEOPOROSIS &  
MUSCULOSKELETAL DISORDERS](#)

[DATA &  
PUBLICATIONS](#)

[GET INVOLVED](#)


[MEETINGS  
& EVENTS](#)

[NEWS &  
MULTIMEDIA](#)

 **WOMEN OVER 50 WILL EXPERIENCE**  **OSTEOPOROTIC FRACTURES. AS WILL**  **MEN**

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## VERTEBRAL FRACTURE TEACHING PROGRAM



**Vertebral Fracture Initiative**

The Vertebral Fracture Initiative has been developed to facilitate the understanding and teaching of osteoporotic spinal fractures for interested radiologists, clinicians and healthcare professionals. The Resource Documents contain the most recent studies and data linked to osteoporosis and vertebral fractures, with commentaries highlighting the key messages to learn and convey. The designed slides are there for you to use and can be easily inserted into your own presentations.

[START THE COURSE NOW >](#)

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### Faculty/Acknowledgement

**VFI Resource Document Lead Authors**

Judy Adams

Neil Binkley

# Stage 1- VFA

All patients with  
vertebral fragility fractures

Present with a  
fragility fracture

Have a VFA

FLS

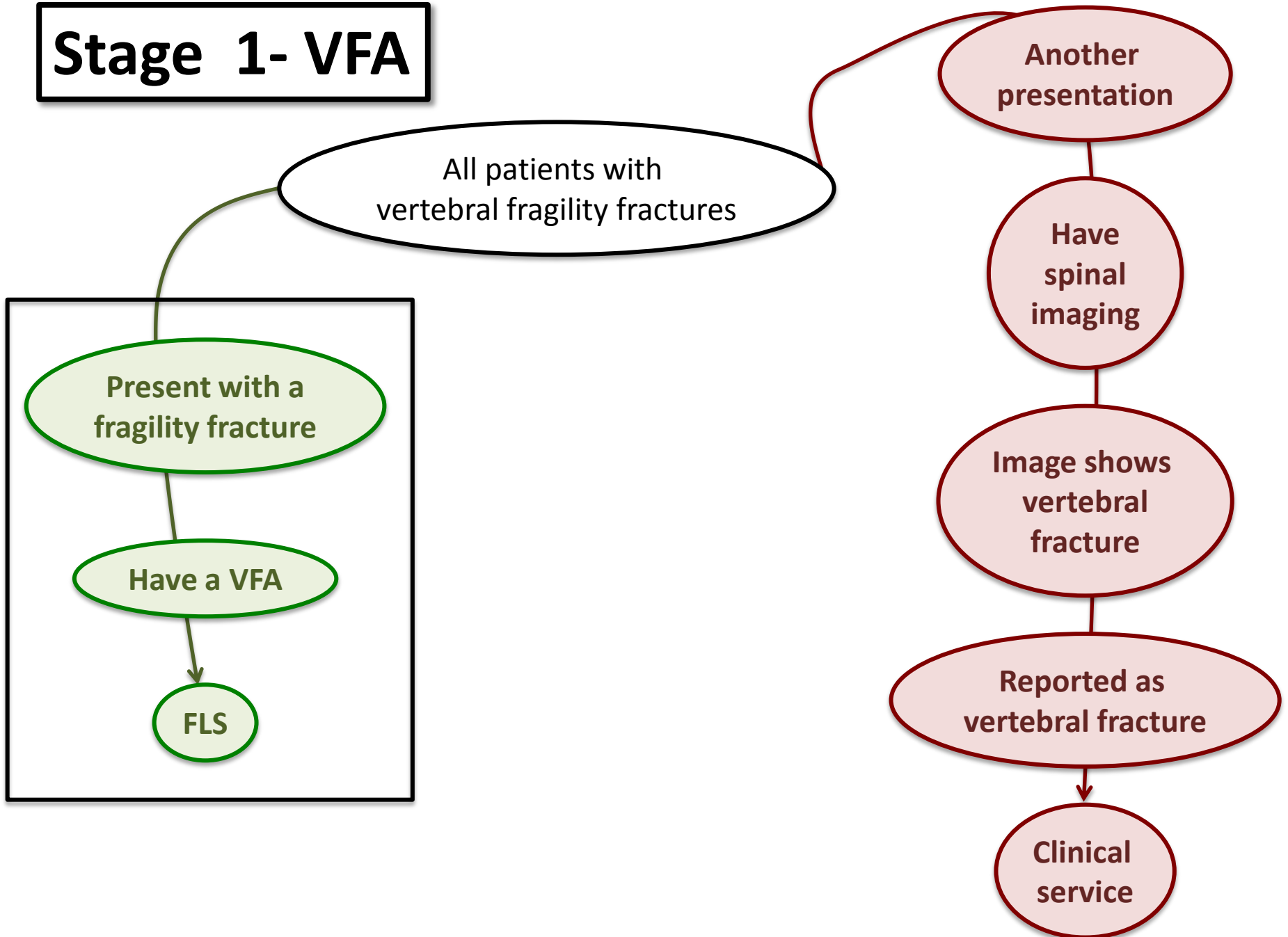
Another  
presentation

Have  
spinal  
imaging

Image shows  
vertebral  
fracture

Reported as  
vertebral fracture

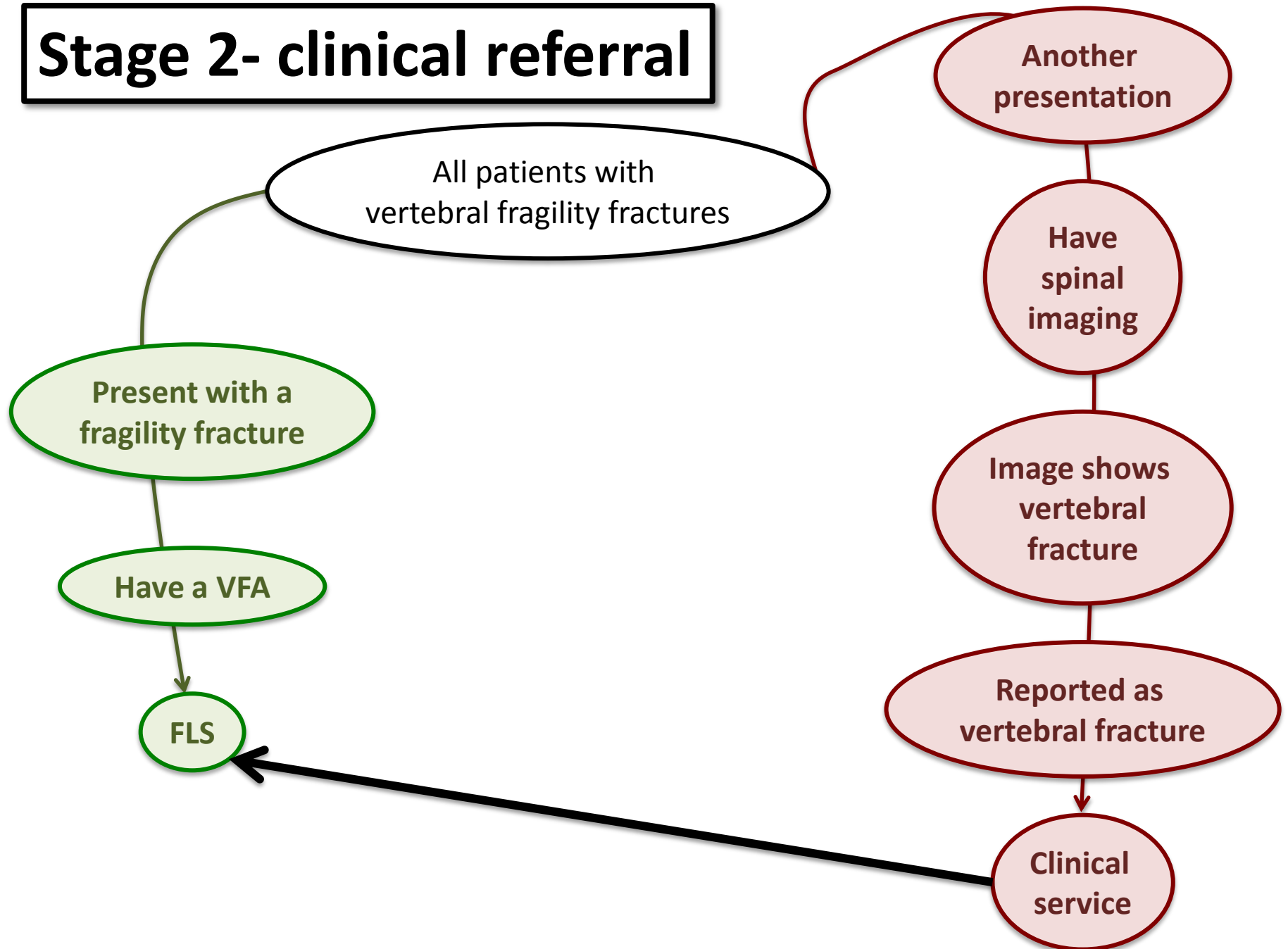
Clinical  
service



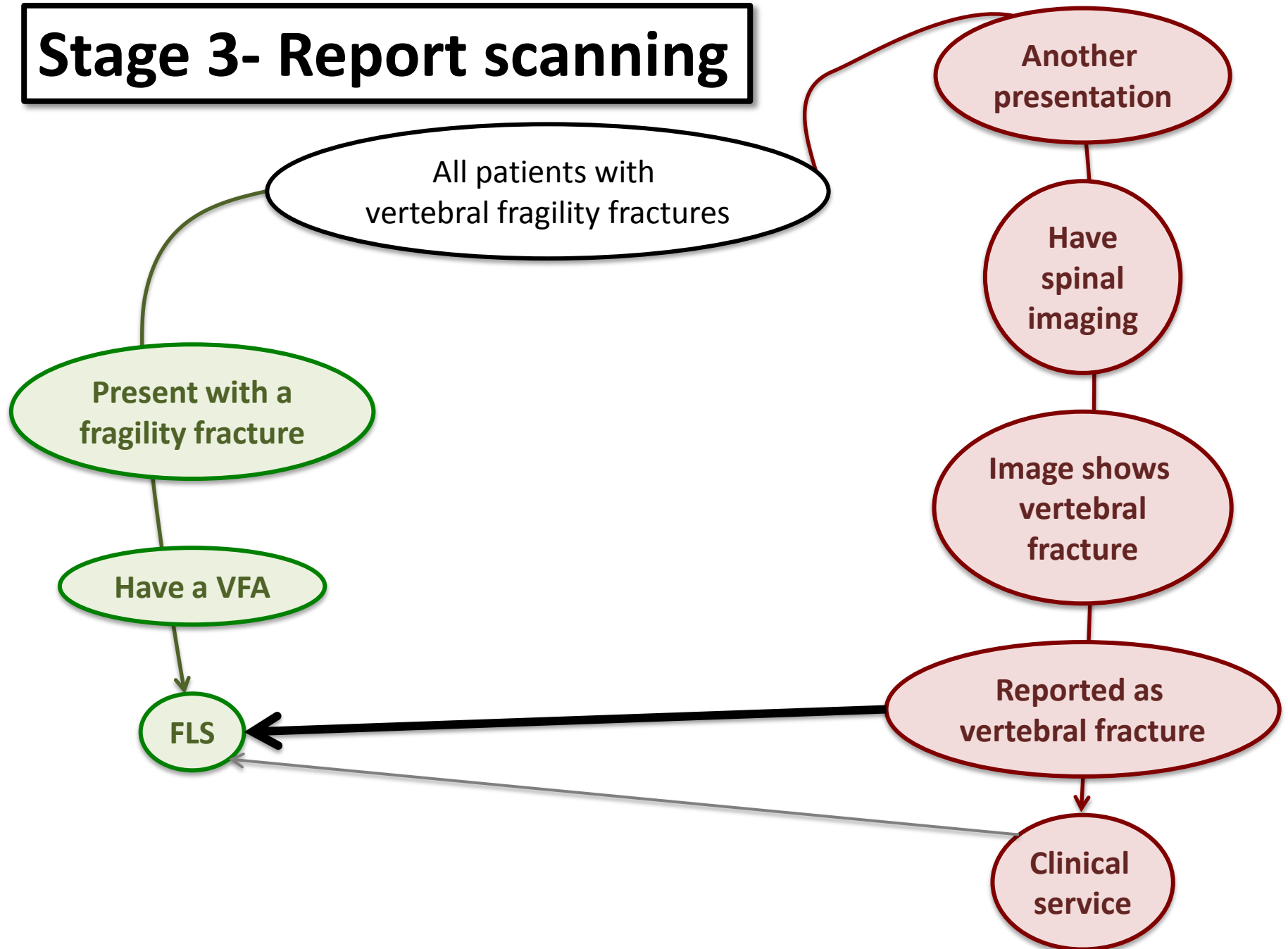
# ICSD 2015

- ▶ Lateral Spine imaging with Standard Radiography or Densitometric VFA is indicated when T-score is  $< -1.0$  and one or more of the following is present:
  - Women age  $\geq 70$  years or men  $\geq$  age 80 years
  - Historical height loss  $> 4$  cm ( $> 1.5$  inches)
  - Self-reported but undocumented prior vertebral fracture
  - Glucocorticoid therapy equivalent to  $\geq 5$  mg of prednisone or equivalent per day for  $\geq 3$  months

# Stage 2- clinical referral



# Stage 3- Report scanning



# Choose your words wisely

End plate depression

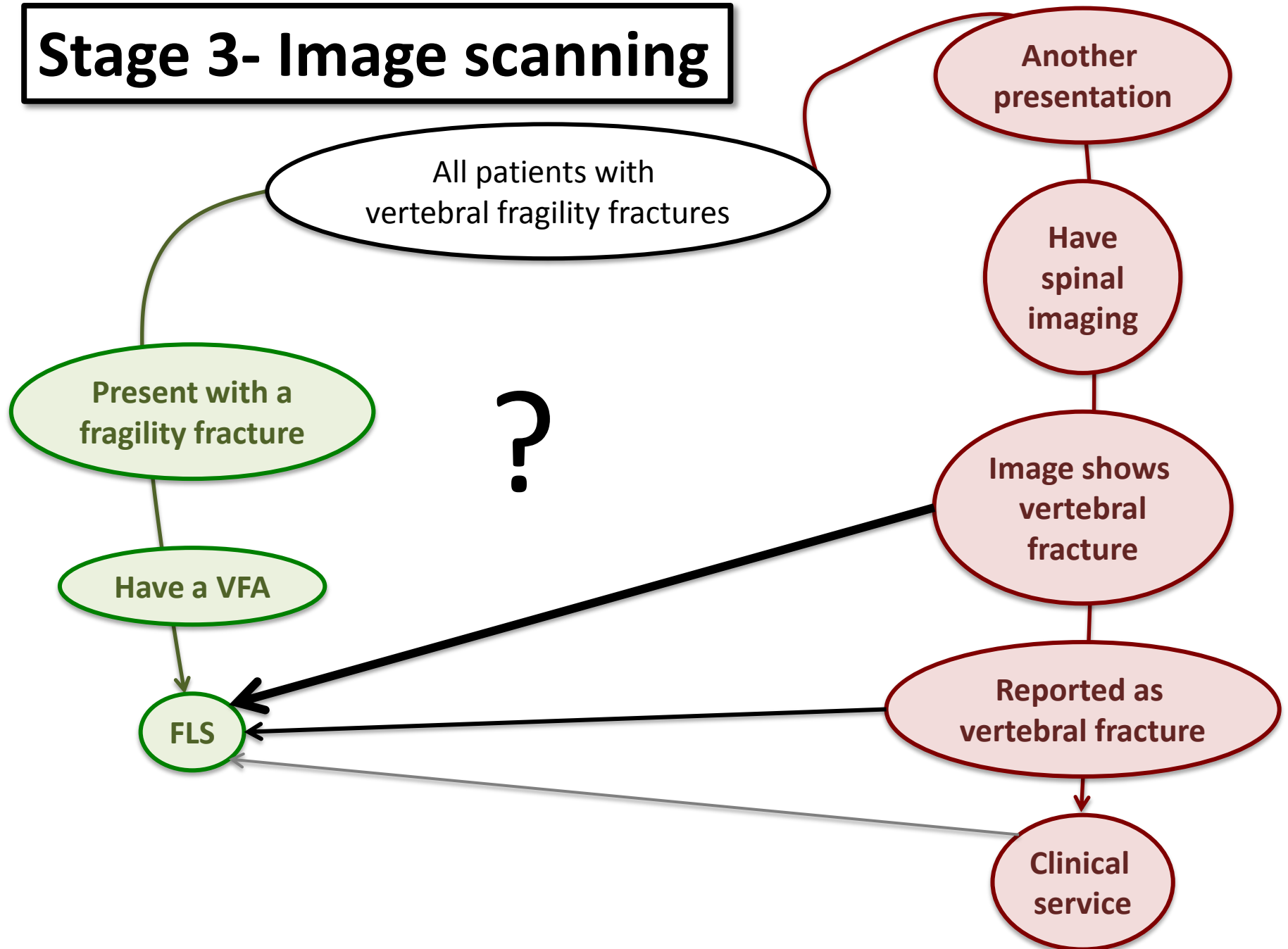
Vertebral deformity

Biconcave/ wedge deformity

Vertebral body height loss

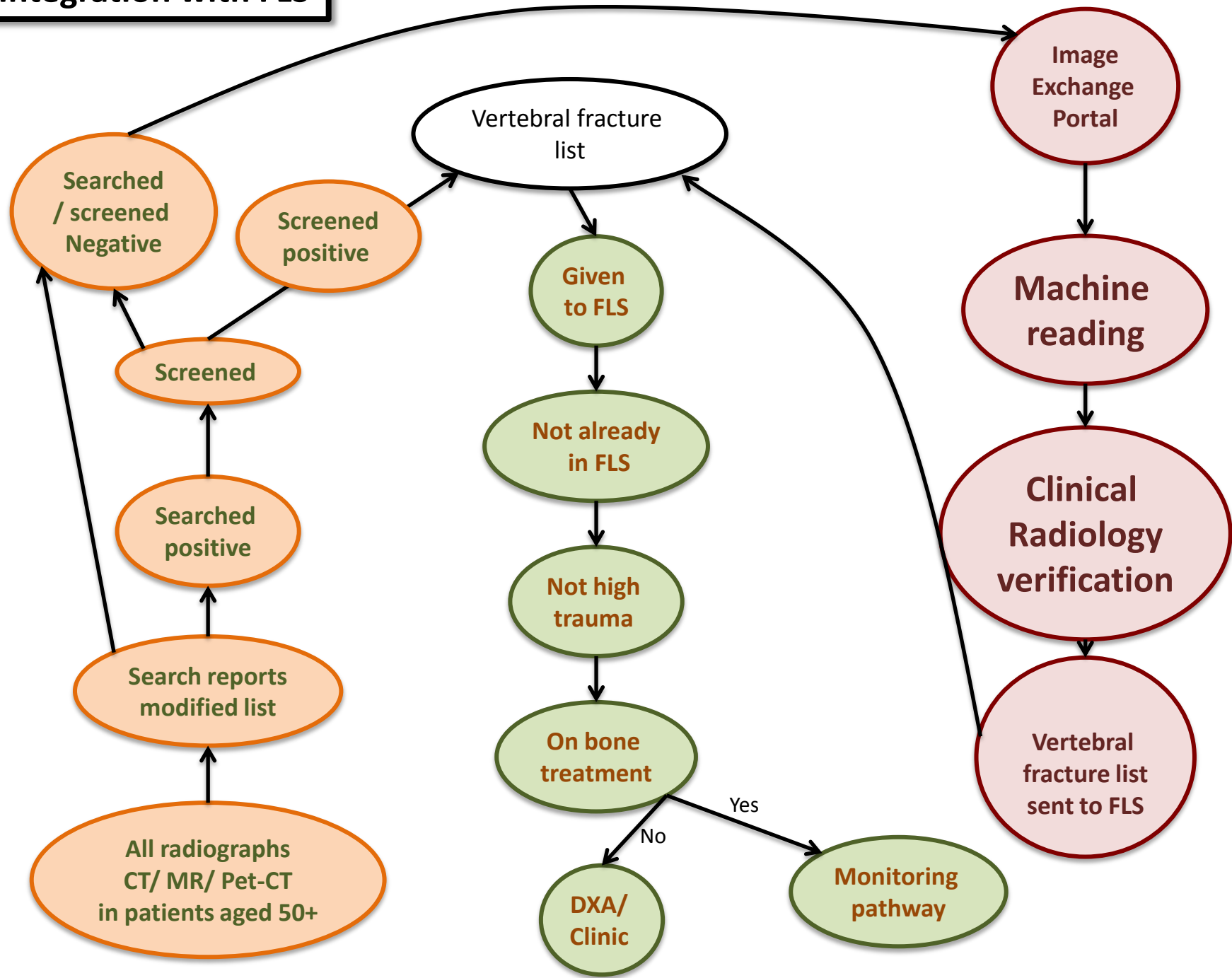
vertebral body collapse

# Stage 3- Image scanning



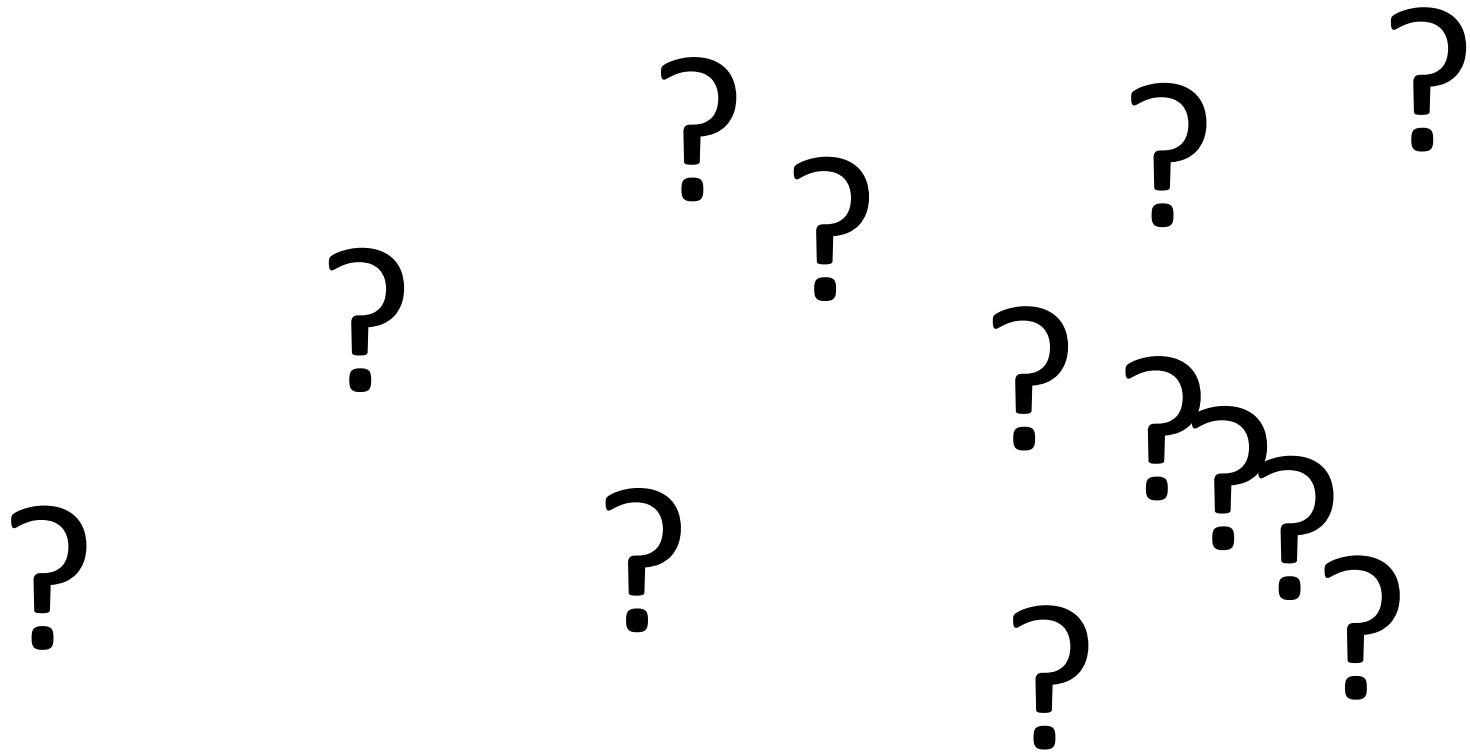


# Integration with FLS



# Falls

- Anti-osteoporosis Medication take >6 months to reduce fracture
- Falls interventions
  - Timely
  - Adhered to
    - Strength and Balance exercise program
    - Medication review
    - Eye sight
    - Home Occupational therapy review



Help is at hand



# MENTORSHIP PROGRAM

View

Edit

Manage display

IOF has developed a mentorship programme to enable FLS implementation worldwide. To achieve this goal, IOF wants to share knowledge and skills by connecting experienced FLS champions with any institutions willing to establish a new FLS.

## THE MENTORSHIP PROGRAMME INCLUDES TWO ASPECTS:

### 1. ON-SITE TRAINING DAY

This activity allows an FLS candidate (mentee) to benefit from a "one-day visit" at the FLS champion's institution (mentor). Material and certificate will be provided. IOF will cover the travel cost for the FLS candidate.

A limited number of on-site training days will be available each year.

If you want to establish an FLS and would like to apply for the on-site training day, please contact Muriel Schneider for more information.

### 2. CTF FLS WORKSHOP

This workshop aims to teach the basic steps on FLS implementation to a group of 15-20 FLS candidates (mentees) within the same country. In close collaboration with a national society, the CTF FLS workshop will be customized to the health system of the country by including local experts within the speaker panel. Course Materials and certificates of attendance will be provided to the mentees.

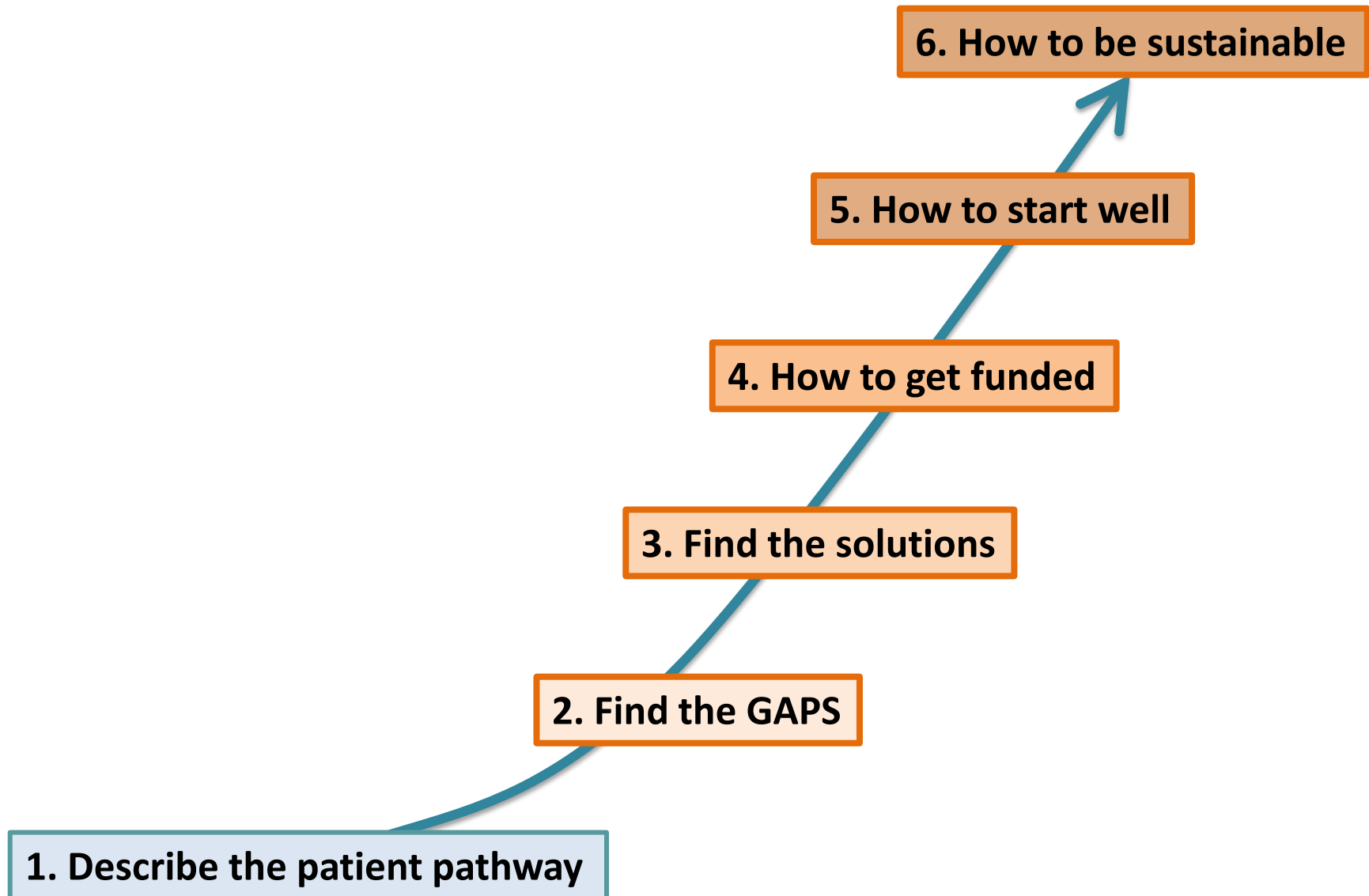
A limited number of workshops will be available each year.

If you are a national society and/or a well-established FLS and would like to organize a CTF FLS workshop in your country, please contact Muriel Schneider at [capturethefracture@iofbonehealth.org](mailto:capturethefracture@iofbonehealth.org) for more information.

5 site visits  
sponsored  
each year

2 workshops this  
year: Russia &  
Czech Republic

# Aims of Mentoring: Achieving the FLS escalator



# 1. Describe the patient pathway

## 2. Find the GAPS

Identification  
Investigation  
Initiation  
Monitoring

Hip

Other inpatients

Outpatients

Spine

clinical  
VFA  
Incidental

Numbers

Population

Fracture type

Sites

Databases

## 3. Find the solutions

## 4. How to get funded

Benefits

Costs

Patient  
Economic / Hospital  
Society / Family

## 5. How to start well

Prioritization  
Stepwise escalation

BPT framework

## 6. How to be sustainable

Does it work?

# Regional network

# Fracture Reduction in South Central Policy group



A  
network  
of every  
bone  
clinician/  
Nurse  
(11  
hospitals)



## AIM:

Every patient with a fragility fracture  
over the age of 50yr in South Central is:

1. Identified
2. Assessed
3. Treated effectively for at least five years  
*for both bone and falls health*

Fracture Liaison Service > Fracture Prevention Service



# What is the regional gap: 2009

## 2009 Case mix of patients receiving secondary fracture prevention

	Site	Inpatients		Outpatient	Vertebral fractures
		Hip fracture	Nonhip fracture		
Berkshire	Reading	Green	Red	Red	Red
	Wexham	Red	Red	Red	Red
Bucks	Milton Keynes	Red	Red	Red	Red
	Stoke Mandeville	Orange	Red	Red	Red
Oxfordshire	John Radcliffe	Green	Orange	Red	Red
	Horton	Red	Red	Red	Red

Green – systematic coverage

Orange – partial/ in development

Red – no coverage

# What is the regional gap: 2015

## 2015 Case mix of patients receiving secondary fracture prevention

	Site	Inpatients		Outpatient	Vertebral fractures
		Hip fracture	Nonhip fracture		
Berkshire	Reading	Green	Orange	Green	Red
	Wexham	Orange	Red	Red	Red
Bucks	Milton Keynes	Green	Green	Red	Red
	Stoke Mandeville	Green	Orange	Orange	Orange
Oxfordshire	John Radcliffe	Green	Green	Green	Orange
	Horton	Green	Green	Green	Red

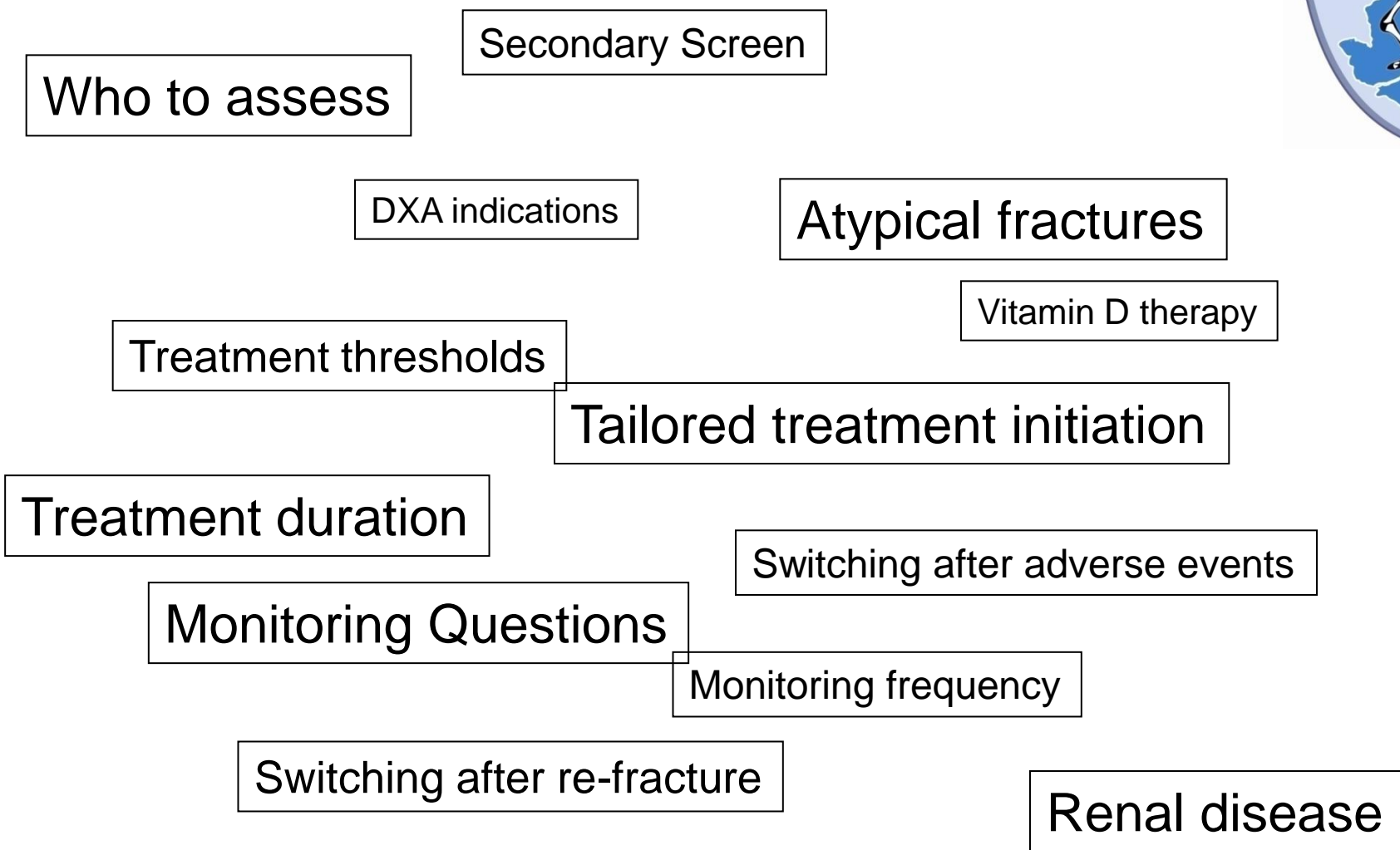
Green – systematic coverage

Orange – partial/ in development

Red – no coverage



# Developed shared guidance



# Developed shared guidance



Who to assess

Secondary Screen

DXA indications

Atypical fractures

Vitamin D therapy

Treatment thresholds

Tailored treatment initiation

Treatment duration

Switching after adverse events

Monitoring Questions

Monitoring frequency

Switching after re-fracture

Renal disease

# SUMMARY

- UK Focus on secondary fracture prevention
  - Multiple stakeholders > unified goal with patients
  - Population approach not hospital based
  - Start small and build up
  - Use the CTF (toolkit, implementation team, events)

Oxford Team past and present:

Cooper, Arden, Wass, Willett, Carr, Price, Glyn-Jones, Hamdy, Ramasay  
A Soni, K Leyland, S Sheard, R Warne, D Prieto Alhambra, A Judge, S Hawley,  
R Pinedo-Villanueva, G Round, R Batra, A Kiran, D Hunter

RUDY team

A Turner

J Barrett

J Hogg

R Popert

D Grey

N Grey

H Teare

J Kaye

R Luqmani

P Wordsworth

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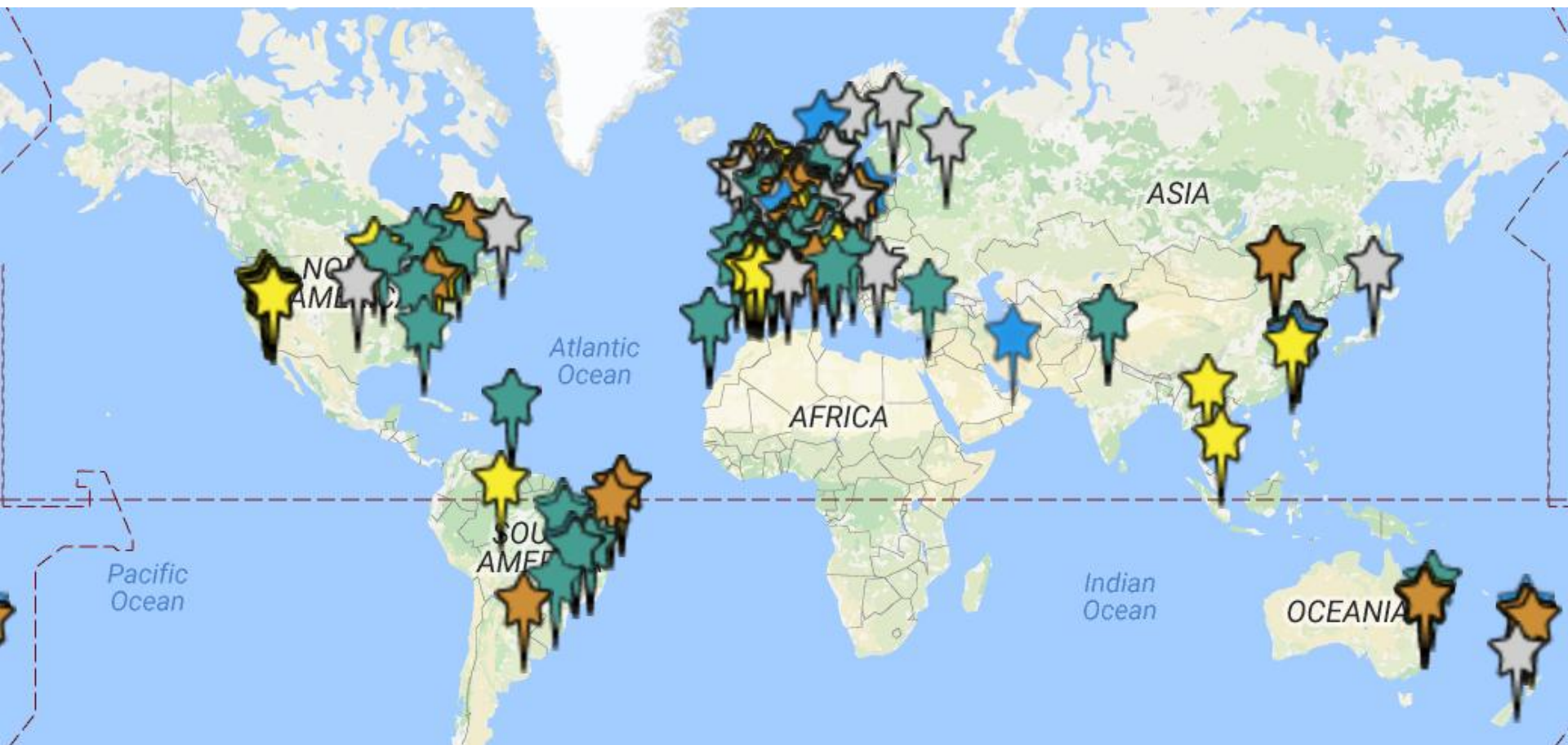
WF Lems

D O'Gradaigh

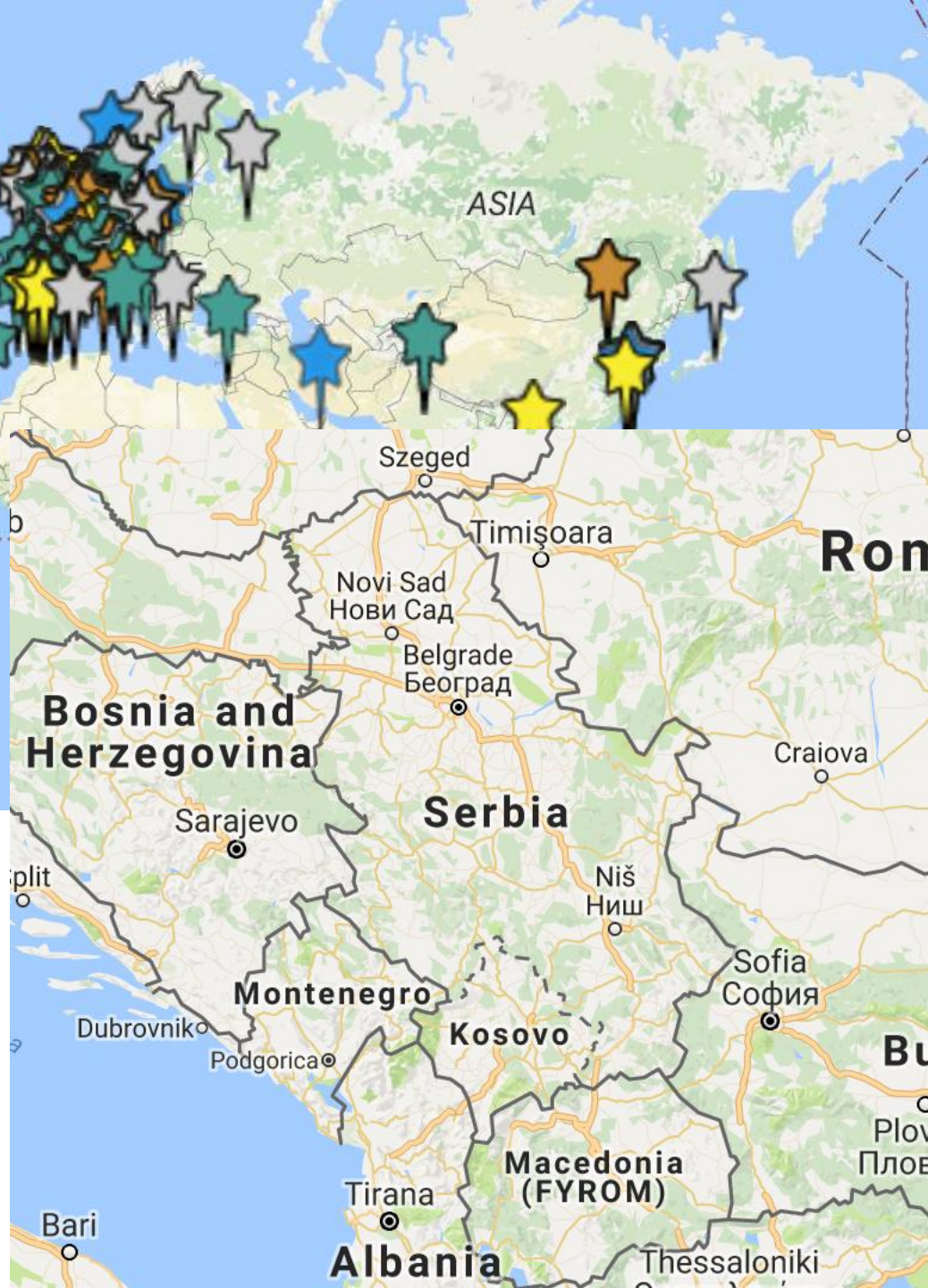
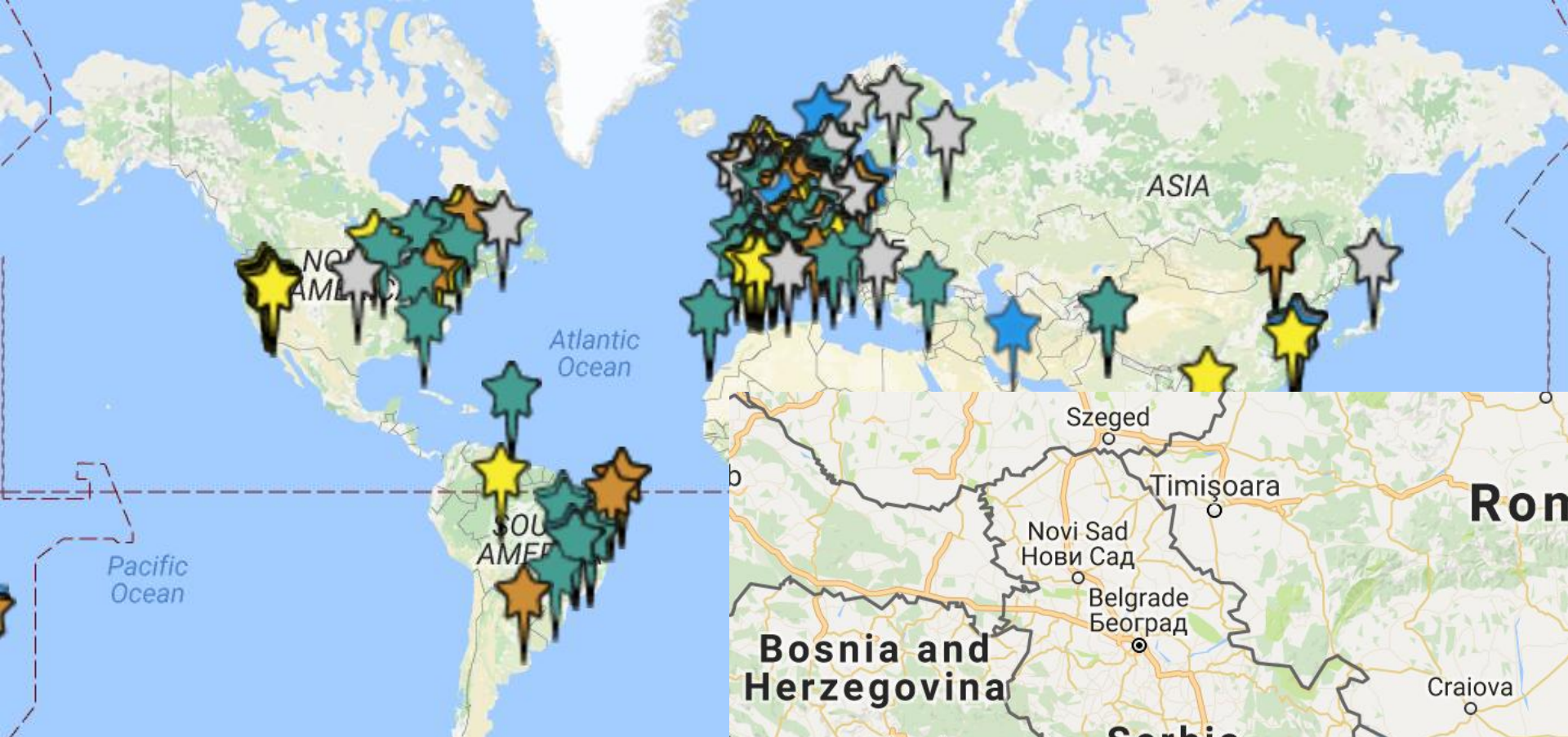
M Schneider

Dominique Pierroz

C Cooper

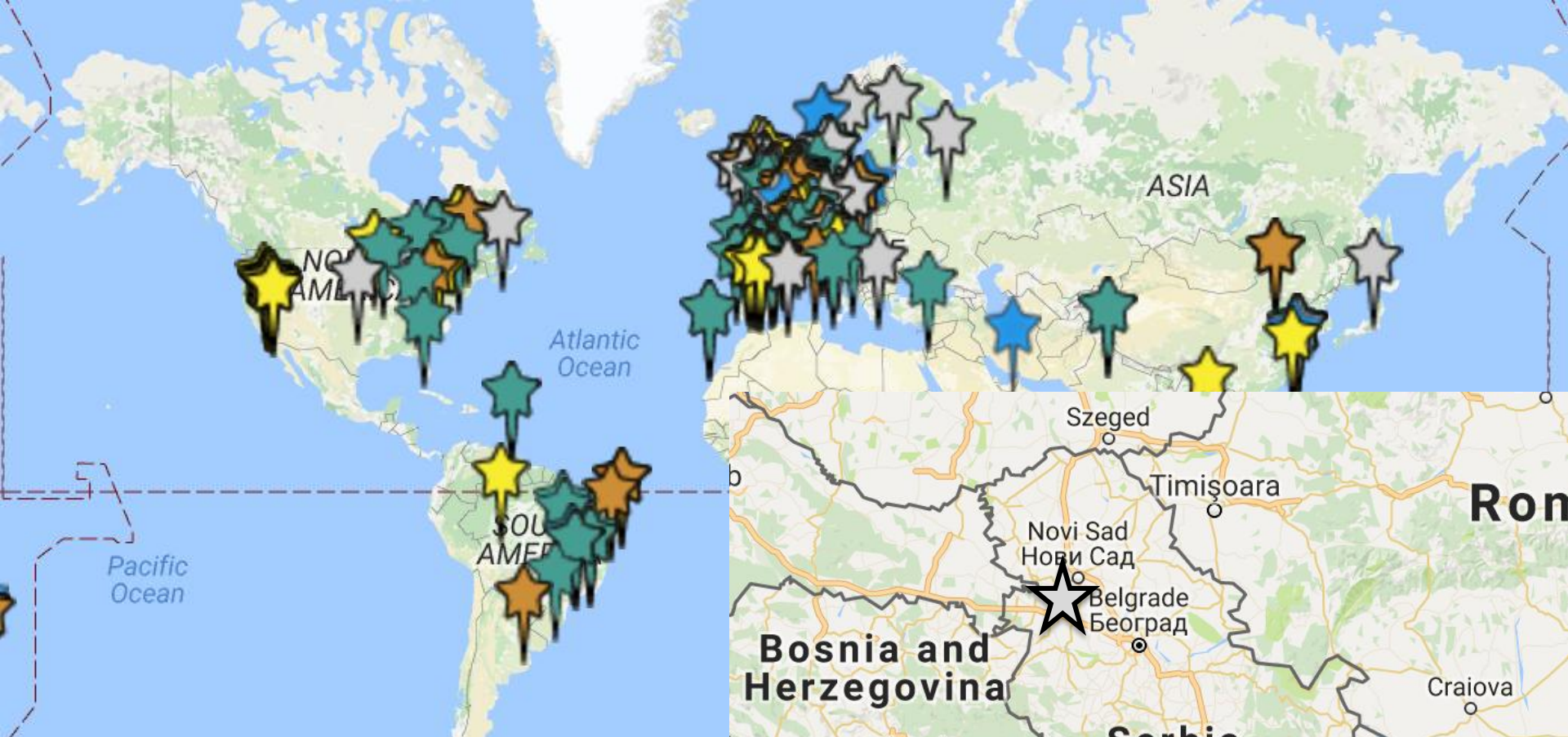






31, 000 hip fractures  
155, 000 fragility fractures /yr  
Over 5 yrs  
28,600 fewer fractures  
£28million saving





250 hip fractures  
1,150 fragility fractures / yr

Over 5 years

230 fewer fracture (96 hips)

£230,000 saving per year

> x2 0.6 WTE nurses + 0.5 admin

**Bosnia and Herzegovina**

**Serbia**

**Montenegro**

**Kosovo**

**Macedonia (FYROM)**

**Albania**

**Romania**

**Bulgaria**

**ASIA**

Szeged

Timișoara

Novi Sad  
Нови Сад

Belgrade  
Београд

Sarajevo

Craiova

Niš  
Ниш

Sofia  
София

Tirana

Thessaloniki

Dubrovnik

Podgorica

Bari

Atlantic Ocean

Pacific Ocean

North America

South America