Fracture Liaison Service: Learning from the mistakes of others

M Kassim Javaid, University of Oxford

RCP team

Advisory group

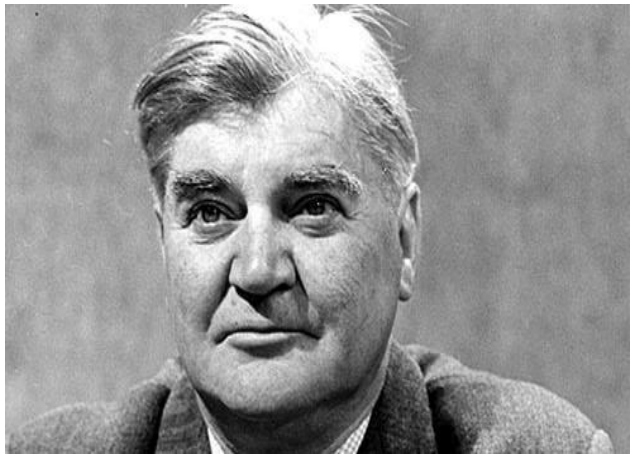
FLS Champions

UK Background

- 60 million
- 3 million osteoporosis women
- 300,000 fragility fractures per year
- 68,000 hip fractures

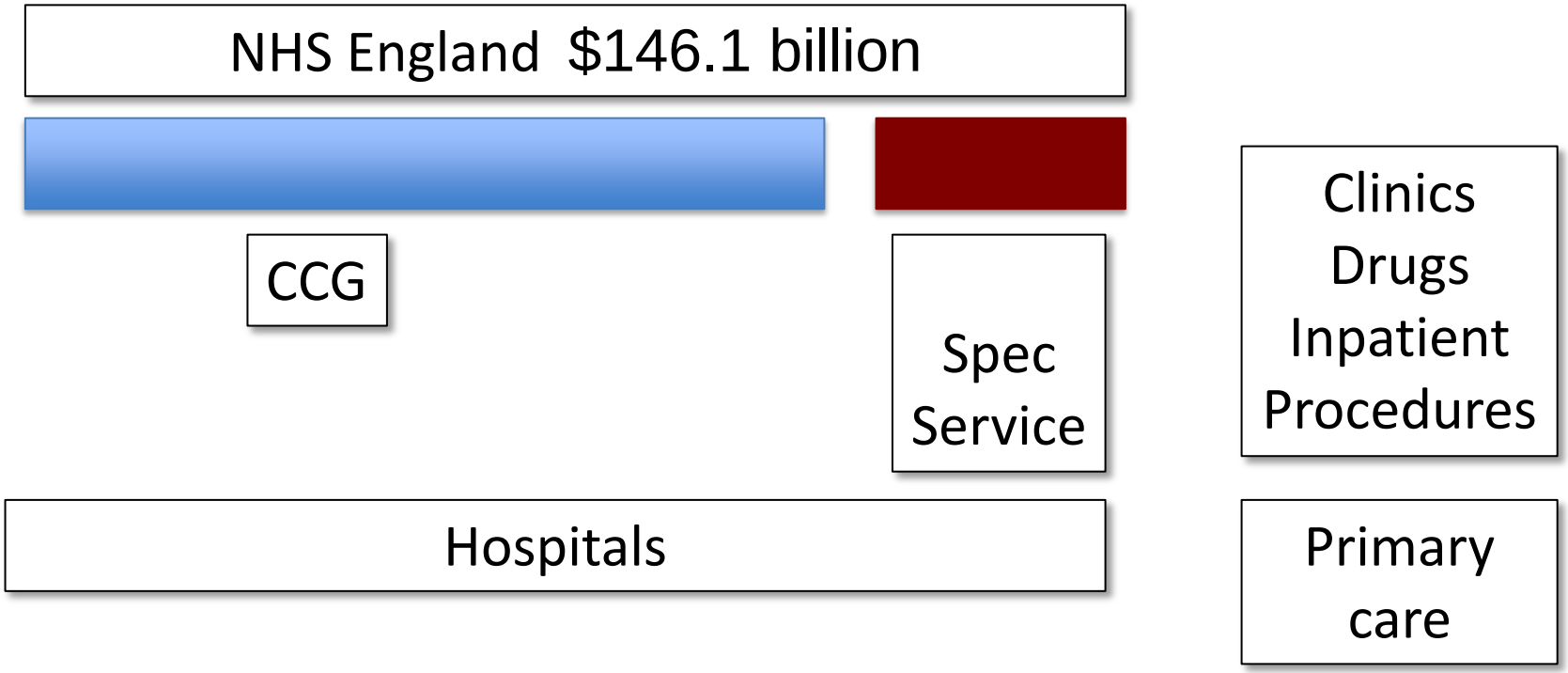
- 20% FLS coverage

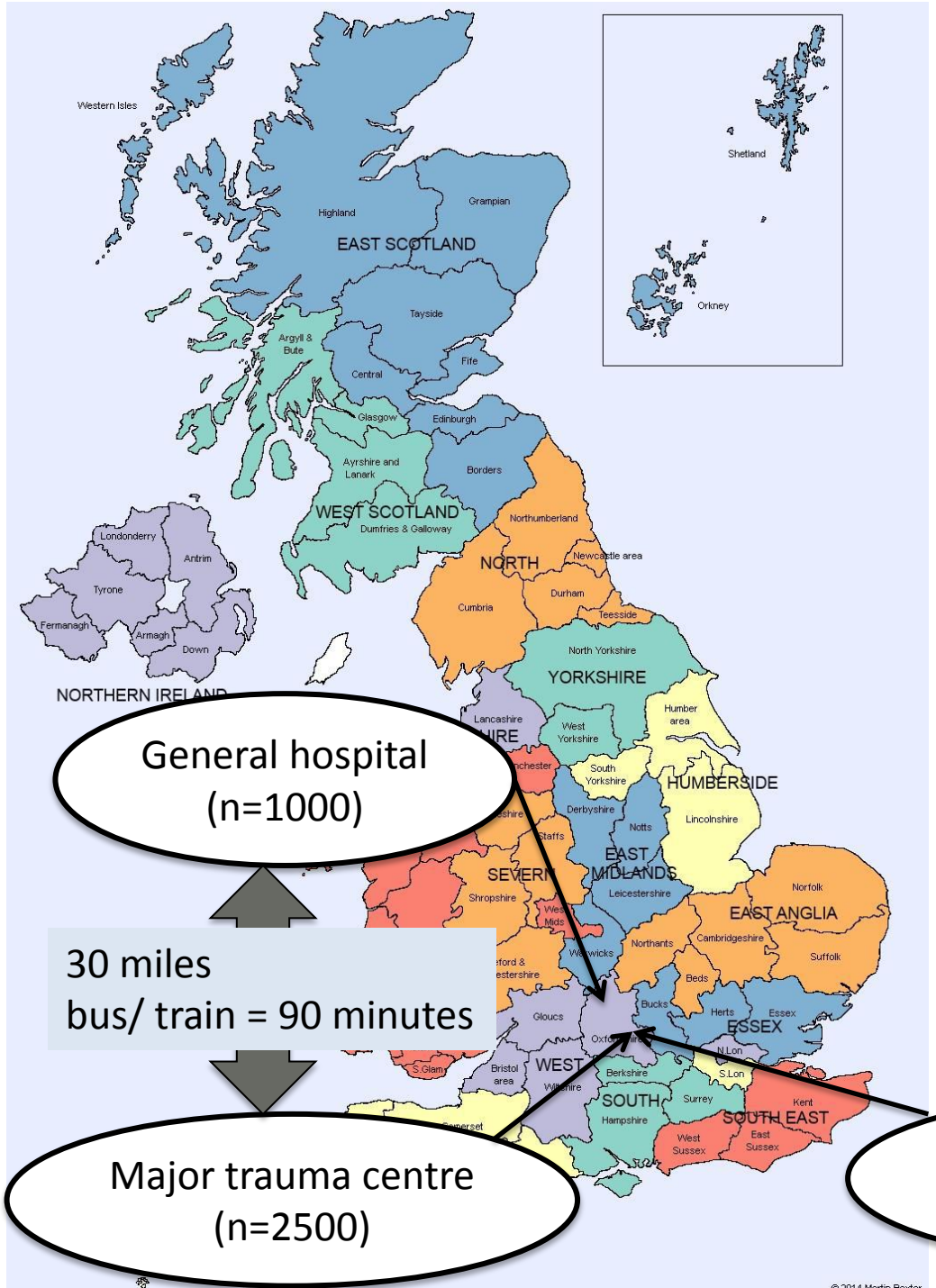
NHS structure: 1948- current



1. comprehensiveness, within available resources
2. universal access, based on need
3. services free at the point of delivery
4. Funded through general taxation

Money


NHS England $146.1 billion
CCG
Spec Service
Clinics
Drugs
Inpatient
Procedures
Hospitals
Primary care



General hospital
(n=1000)

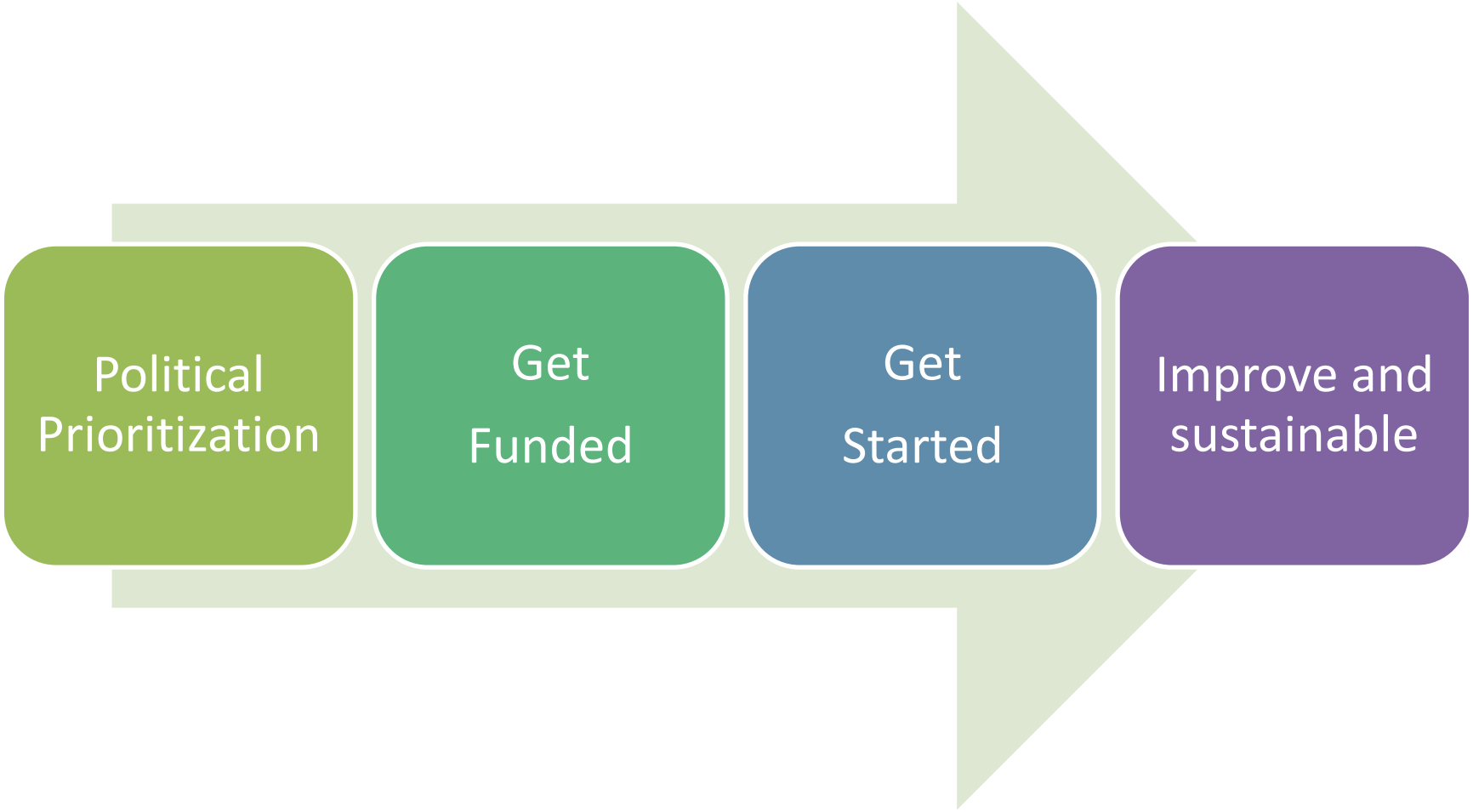
30 miles
bus/ train = 90 minutes

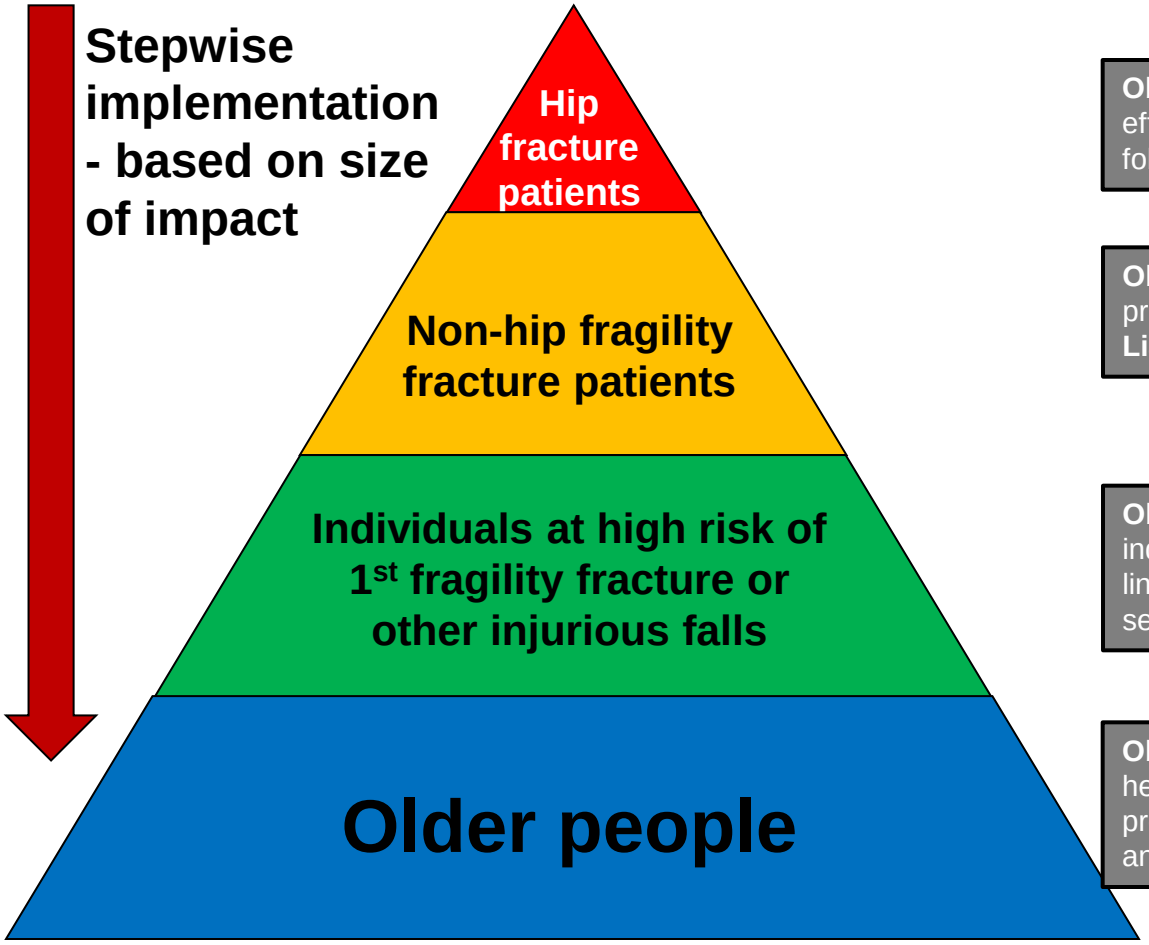
Major trauma centre
(n=2500)

Specialist Orthopaedic
(DXA)

Parking!

Establish how to Apply to the Best Practice Recognition Programme





Objective 1: Improve outcomes and improve efficiency of care after hip fractures – by following **the 6 "Blue Book" standards**

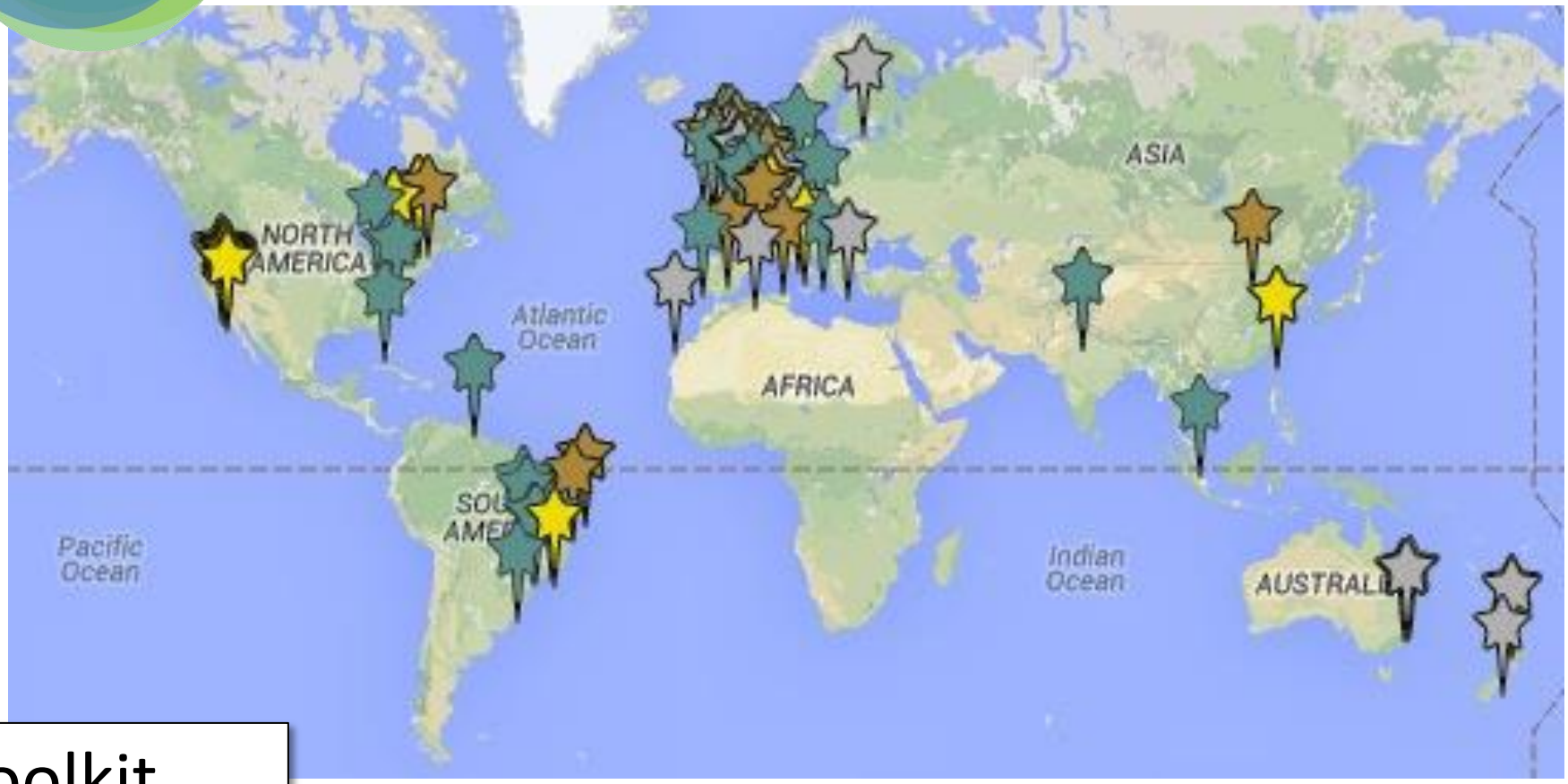
Objective 2: Respond to the first fracture, prevent the second – through **Fracture Liaison Services** in acute and primary care

Objective 3: Early intervention to restore independence – through **falls care pathway** linking acute and urgent care services to secondary falls prevention

Objective 4: Prevent frailty, preserve bone health, reduce accidents – through preserving physical activity, healthy lifestyles and reducing environmental hazards

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

CAPTURE *the* FRACTURE



Toolkit Resources

International Osteoporosis Foundation

Clinical Standards for Fracture Liaison Services

Outlines 10 standards to replicate evidence-based best practice

NHS England

National Osteoporosis Society

Fracture Liaison Service Implementation Group

Public Health England

Falls & Fragility Fractures Systems Annual Report 10% of the UK

Royal College of Physicians

Falls and Fragility Audit Programme FLS-Database

FLS Toolkit Economic benefit

NOS Fracture Prevention Practitioner Online Course & Certification

CCG commission effective services

FLS Standards – BOA National NOS & International IOF

Set the outcome: need to ensure all patients over 50 years have 4 steps

TOP

Find them

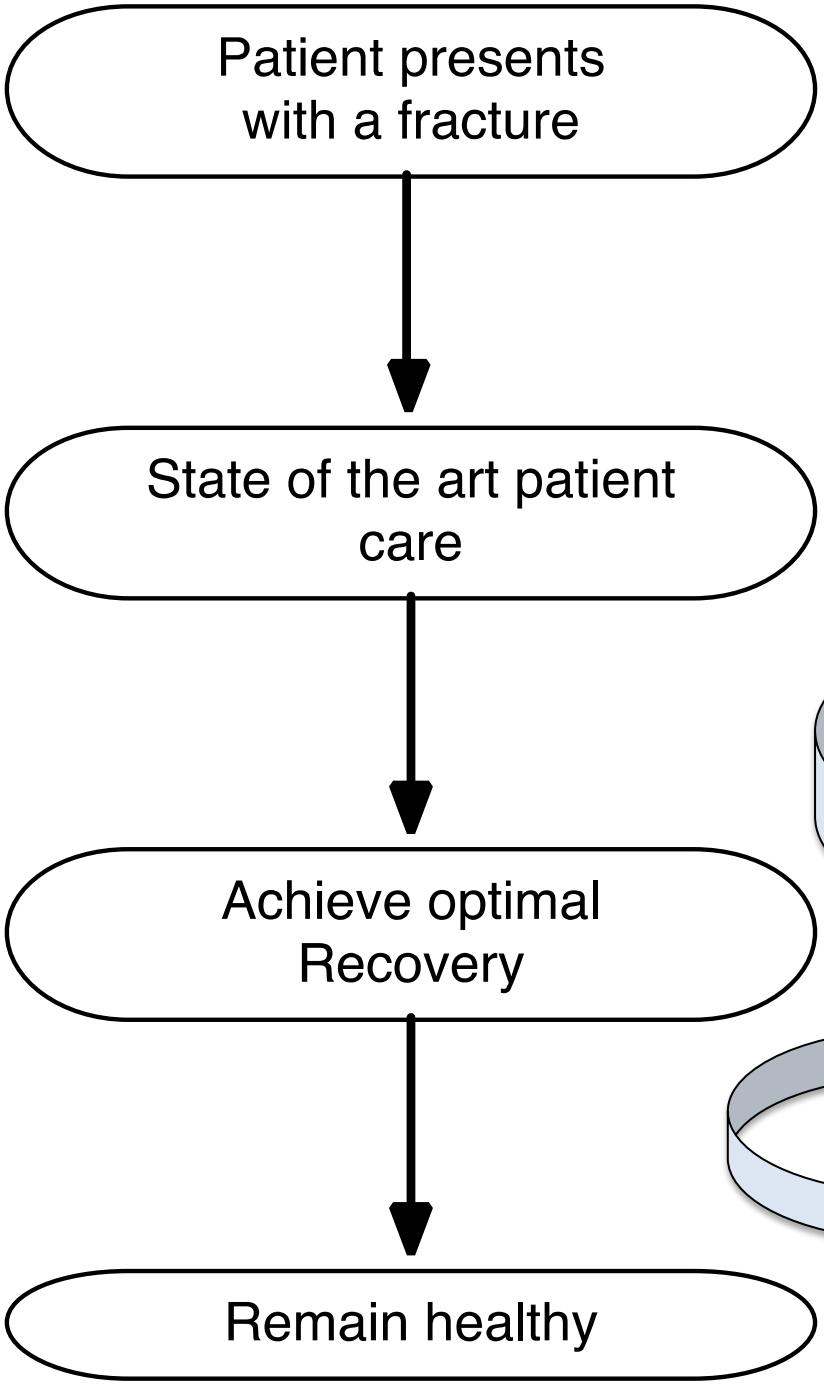
Assess them

Decide which treatment

Make sure they stay on it

BOTTOM

Champion: Work out how much and how to do this for the locality



National Audits

National Hip Fracture Database

Inpatient Falls Audit

Effective Secondary Fracture Prevention

Marsh OI 2011, Eisman JBMR 2012

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				
	Wexham				
Bucks	Milton Keynes				
	Stoke Mandeville				
Oxfordshire	John Radcliffe				
	Horton				

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				
	Wexham				
Bucks	Milton Keynes				
	Stoke Mandeville				
Oxfordshire	John Radcliffe				
	Horton				

Green – systematic coverage
Orange – partial/ in development
Red – no coverage

Developed shared guidance

Secondary Screen

Who to assess

DXA indications

Atypical fractures

Vitamin D therapy

Treatment thresholds

Tailored treatment initiation

Treatment duration

Switching after adverse events

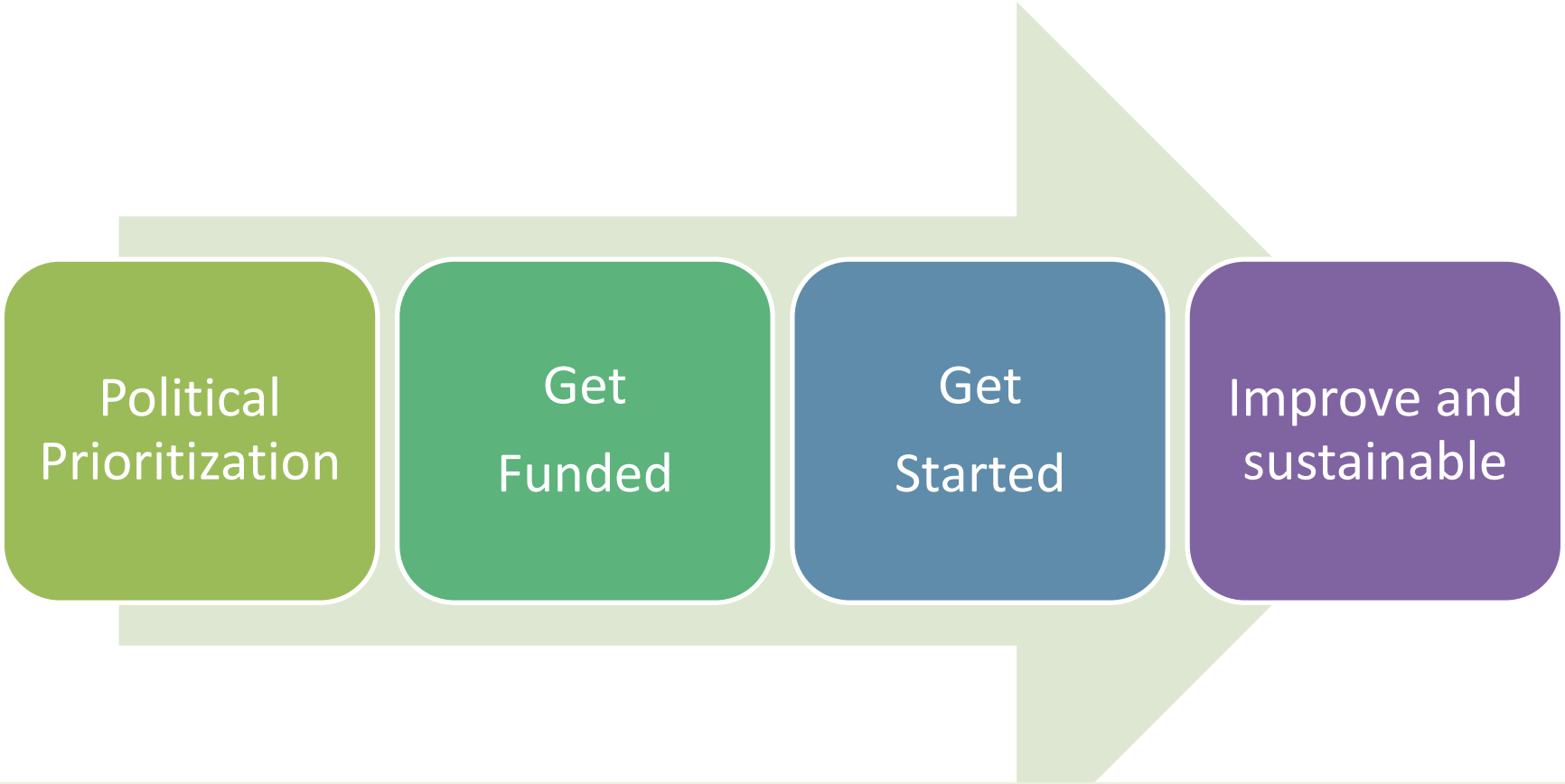
Monitoring Questions

Monitoring frequency

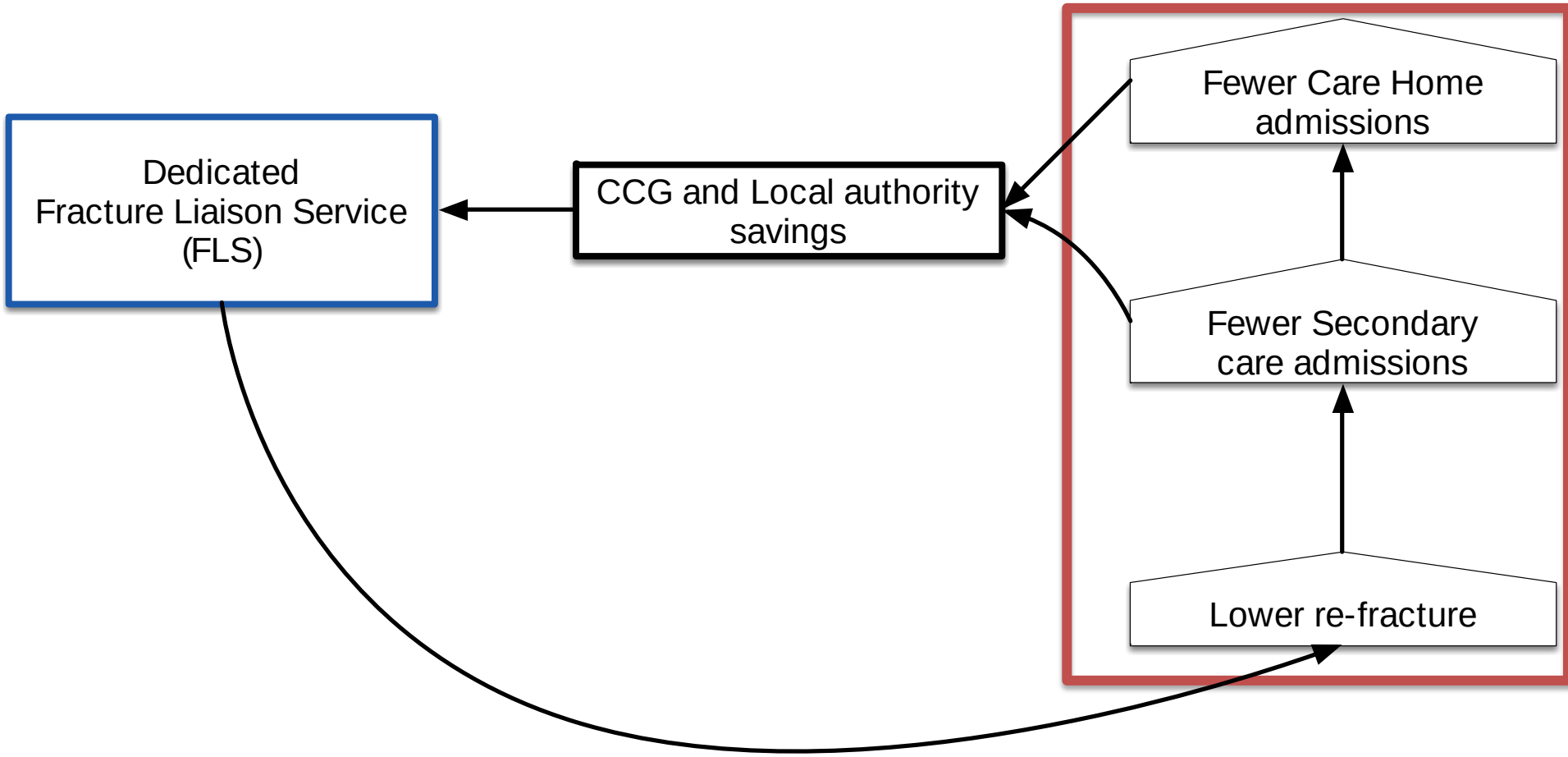
Switching after re-fracture

Renal disease

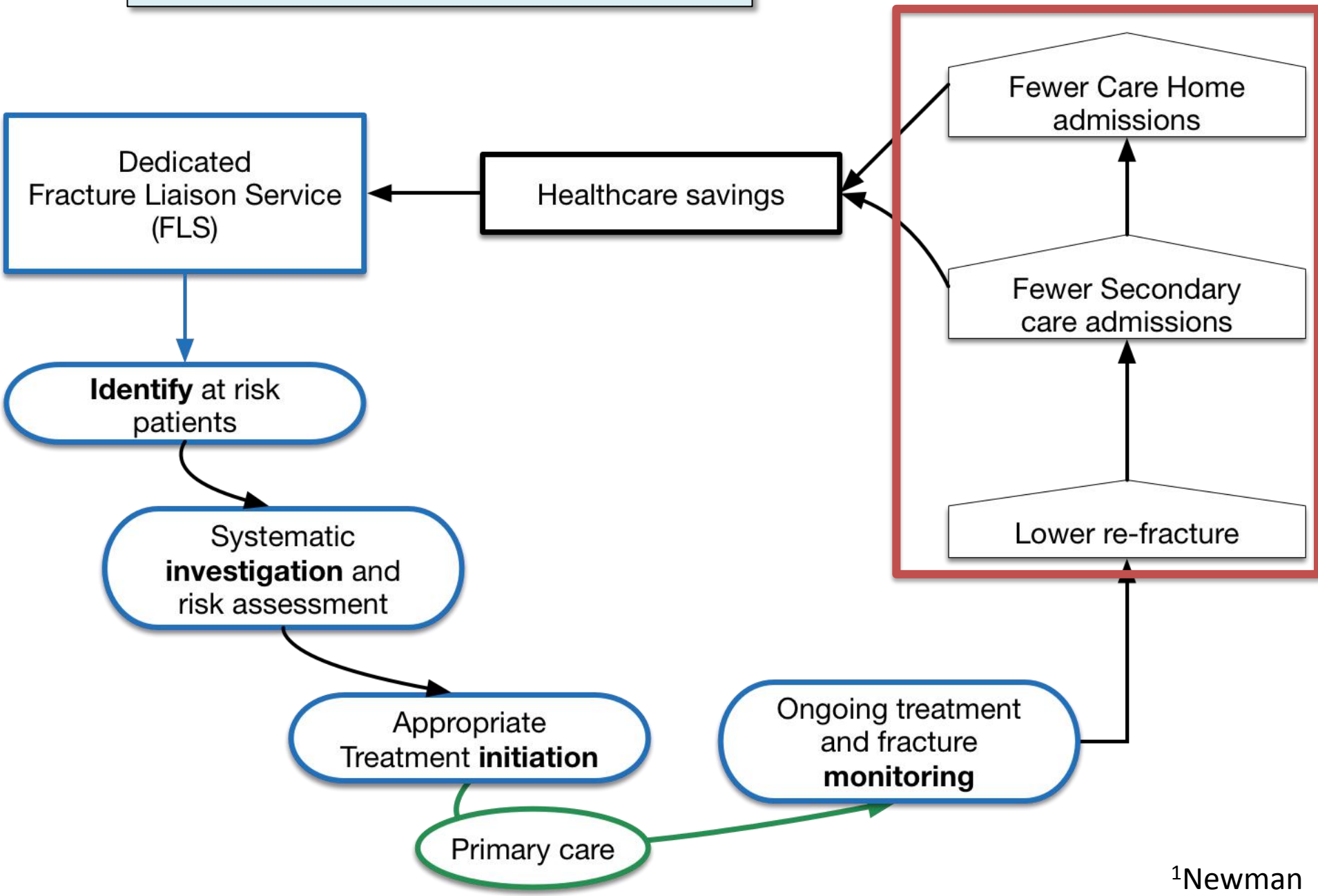
Close the secondary fracture prevention gap



What is the effective local model?


Dedicated
Fracture Liaison Service
(FLS)
CCG and Local authority
savings
Fewer Care Home
admissions
Fewer Secondary
care admissions
Lower re-fracture

Closing the care gap is hard!



[1]Newman

Is every FLS automatically effective?

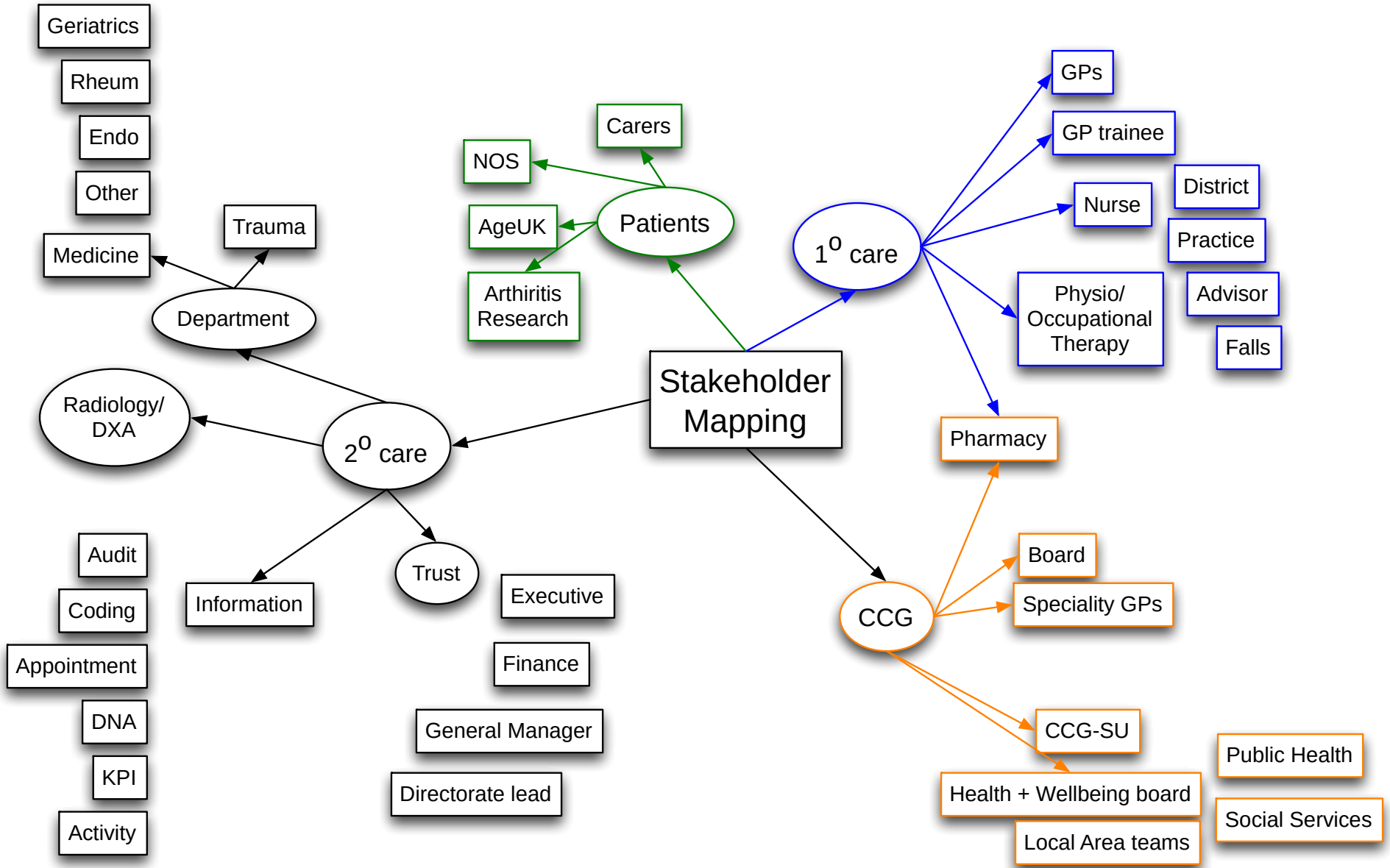
1. **Set clear criteria and standards**
2. **Audit services against them**
3. **Feedback**
4. **Inform commissioning**

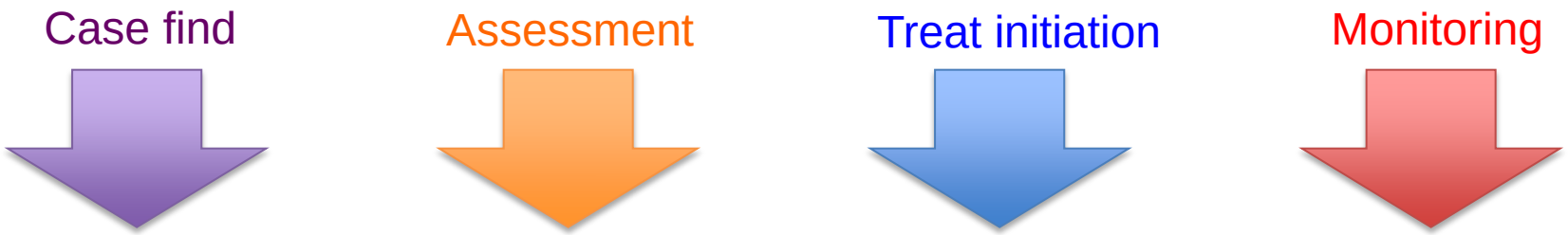
FLS = system solution

- Scope
  - Population
    - 50+ with a fragility fracture
  - Single high level aim
    - Everyone is:
      - Identified
      - Investigated
      - Initiated
      - Monitored
        - … for 5 years
- Objectives
  - Criteria
  - Standards

Bone & falls

Oxford stakeholder map





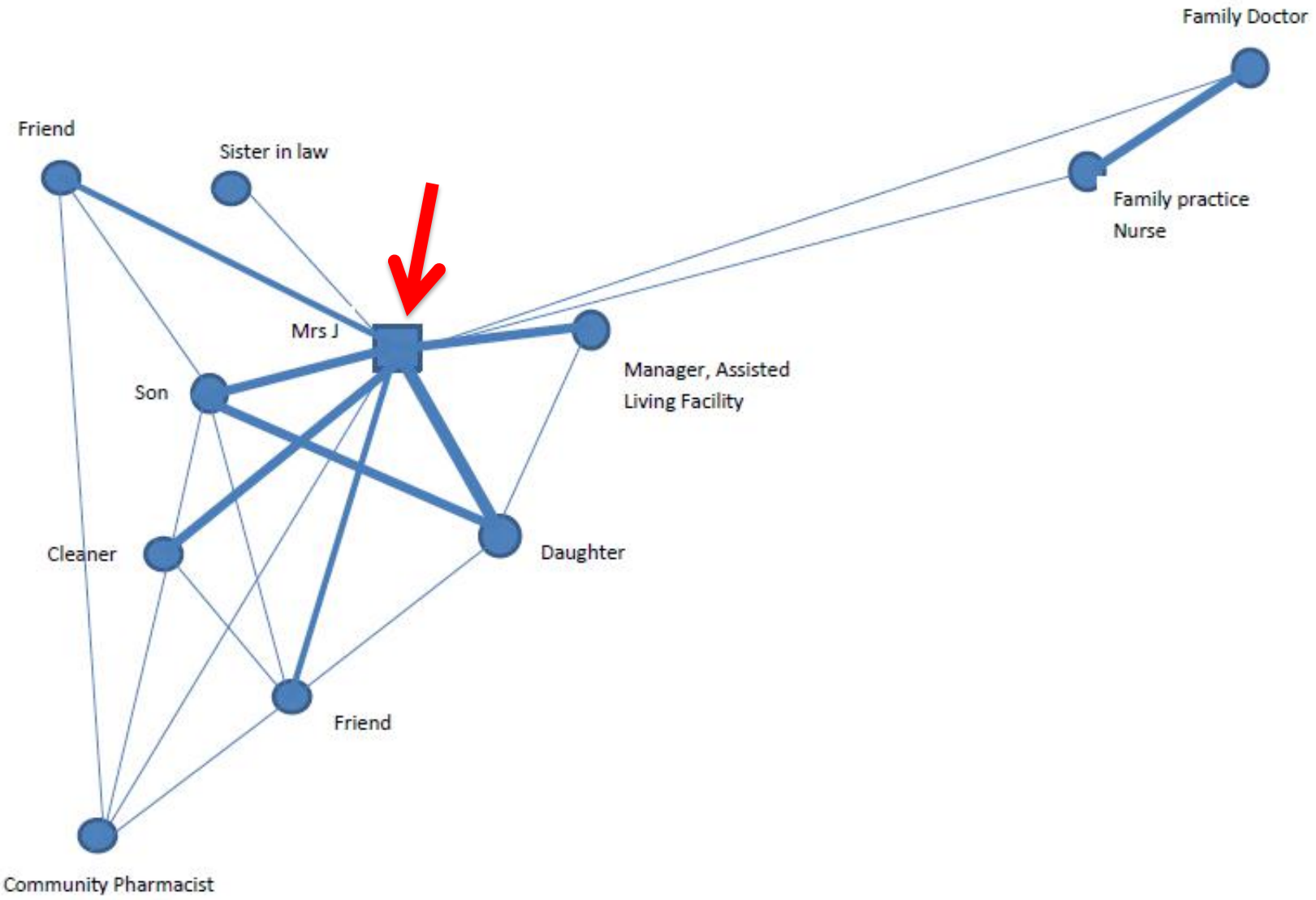
- Transfer care from high cost specialist settings to lower cost community settings

- Integrated care
  - Cost effective…
  - Safety
  - Patient Experience

- Networked Interface servi
  - Hospital case finding + comm y monitoring

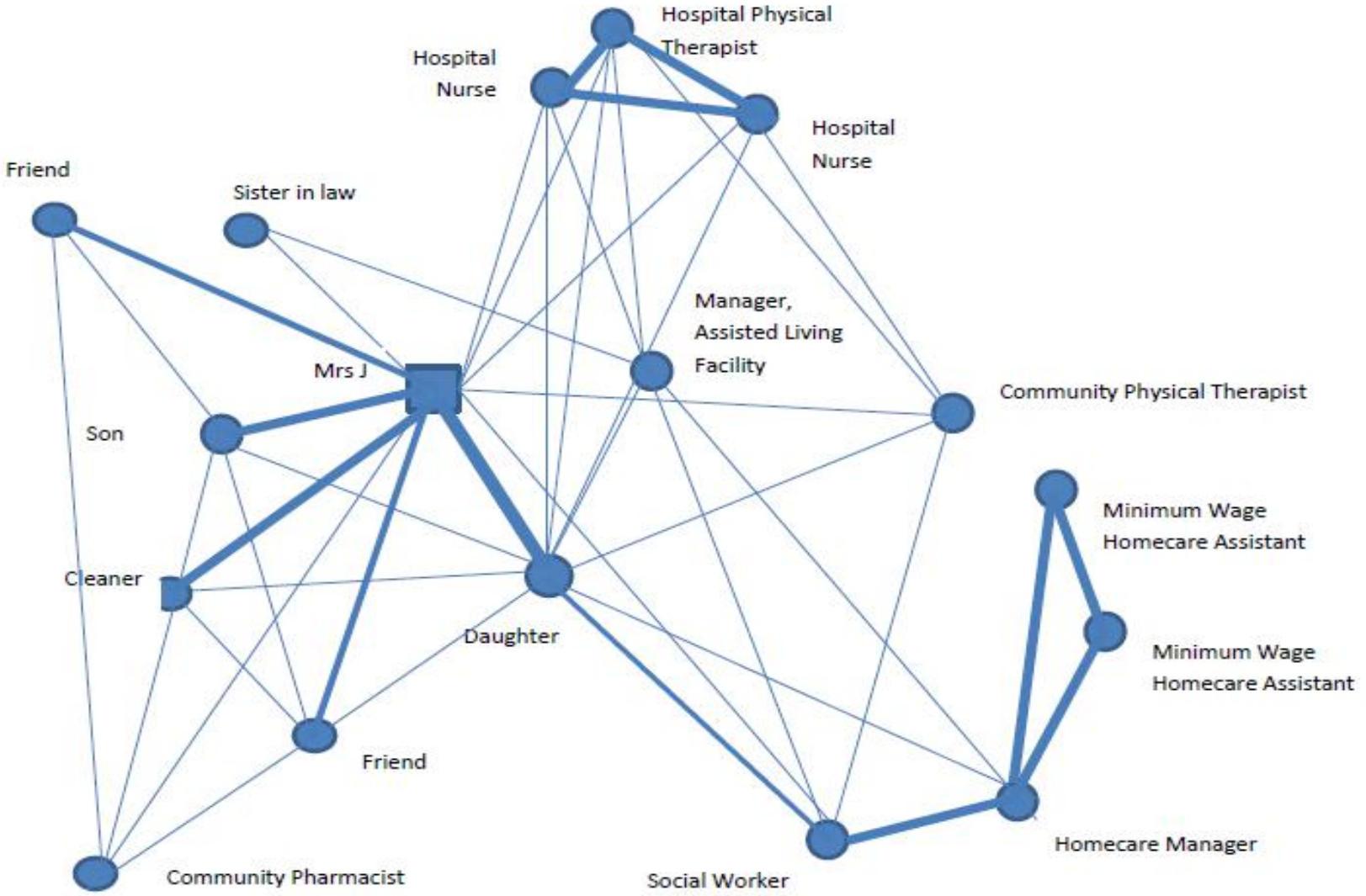
Minimally disruptive Intervention

24 hours pre-hip fracture network



May 2014

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



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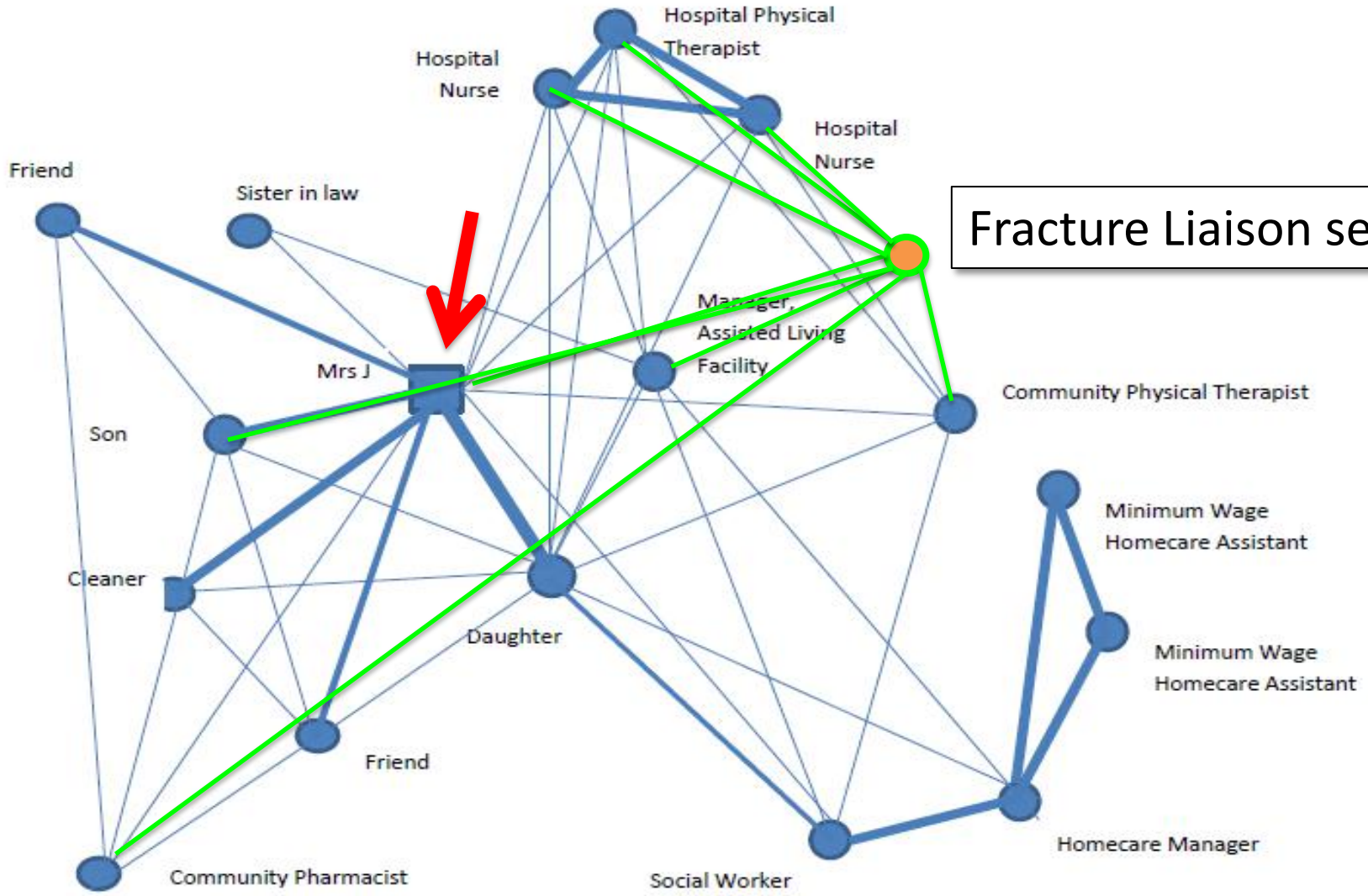
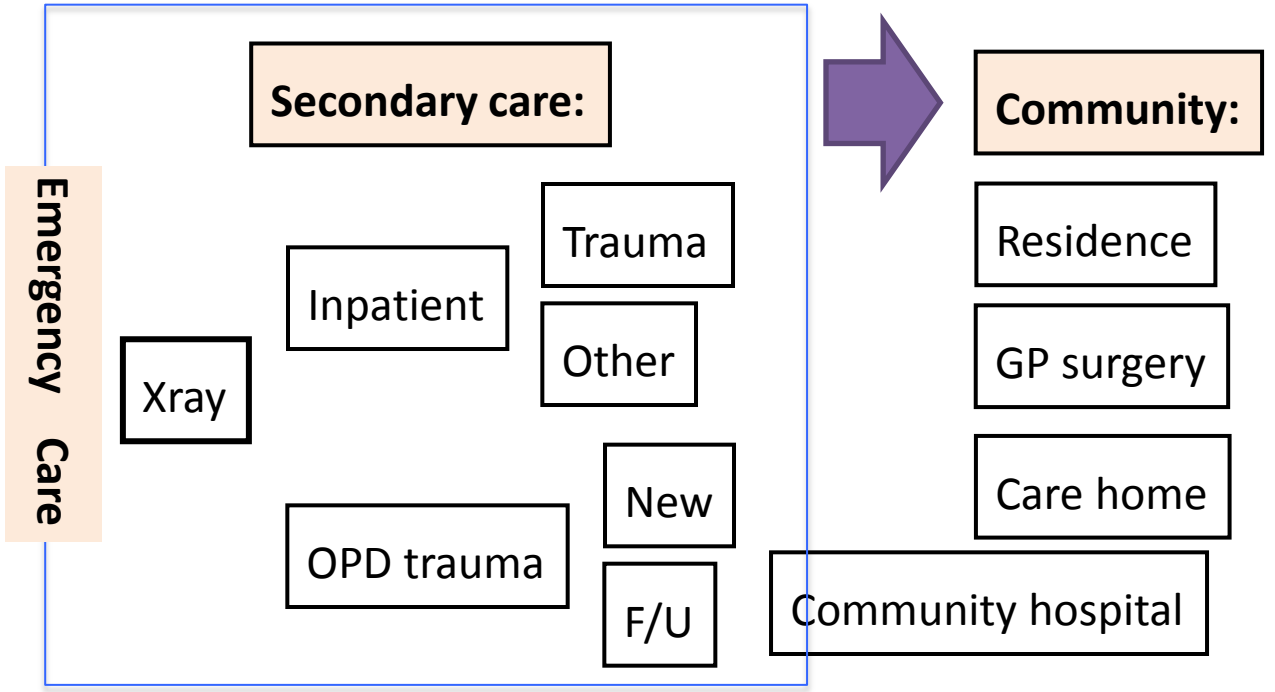


Minimally disruptive Intervention

May 2014

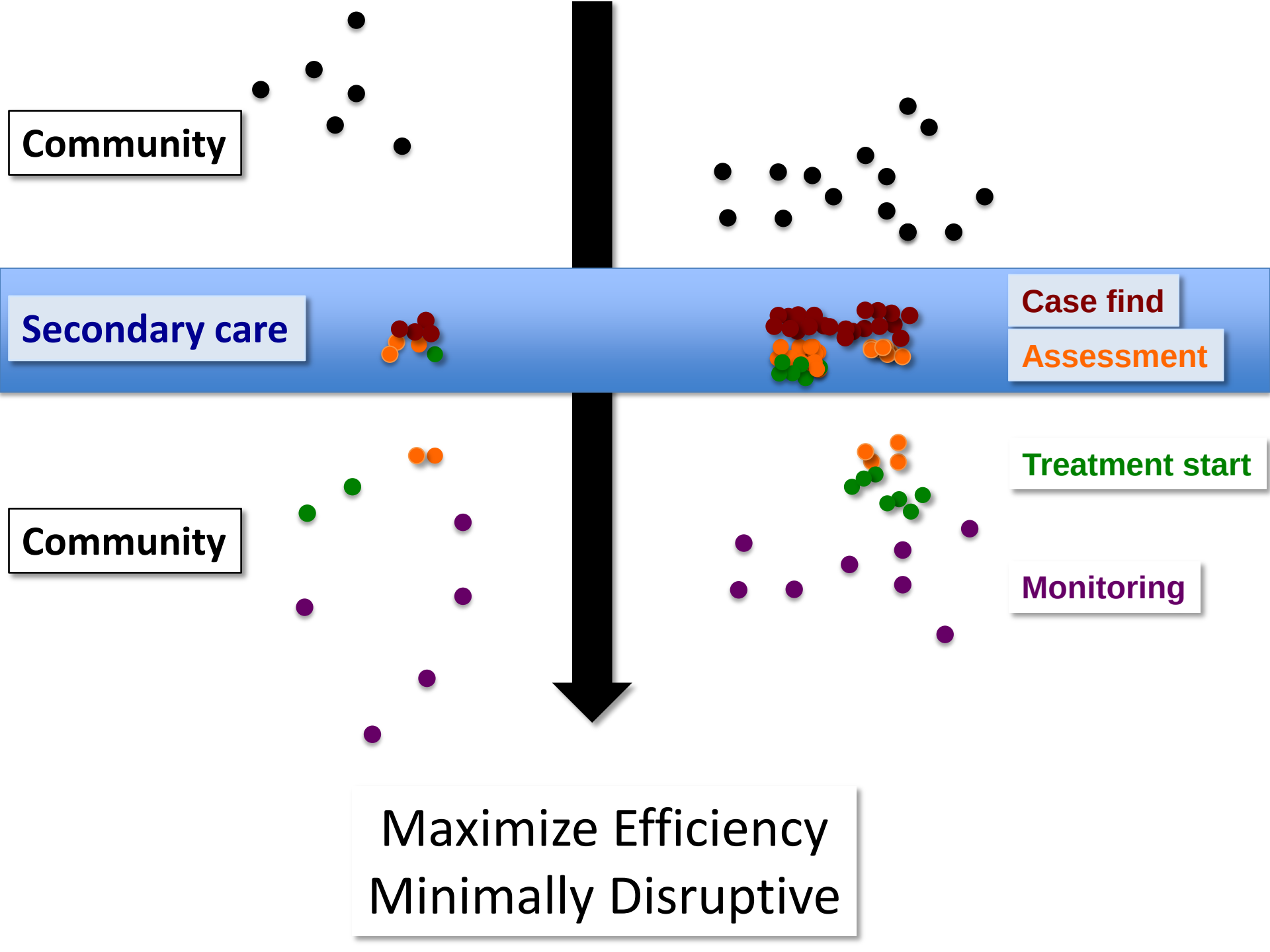
Understand the local Patient flow



1. Volume

2. Distribution –
    1. Number of hospital/GP sites
    2. Type of OPD clinic

Missing tribe
    a. Pelvic fracture
    b. Spine fracture
    c. Inpatient fracture


Community
Secondary care
Case find
Assessment
Community
Treatment start
Monitoring
Maximize Efficiency
Minimally Disruptive

Finding them all…

See patient while in trauma

Complete assessment

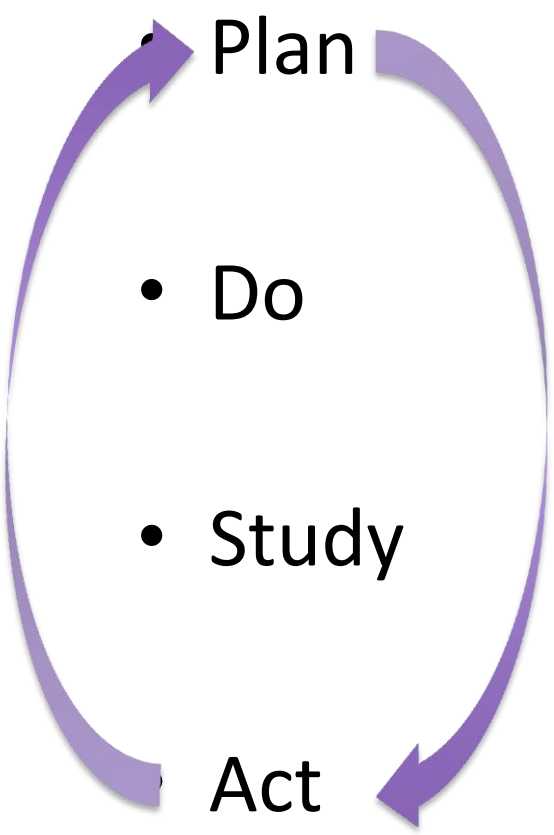
Start Monitoring

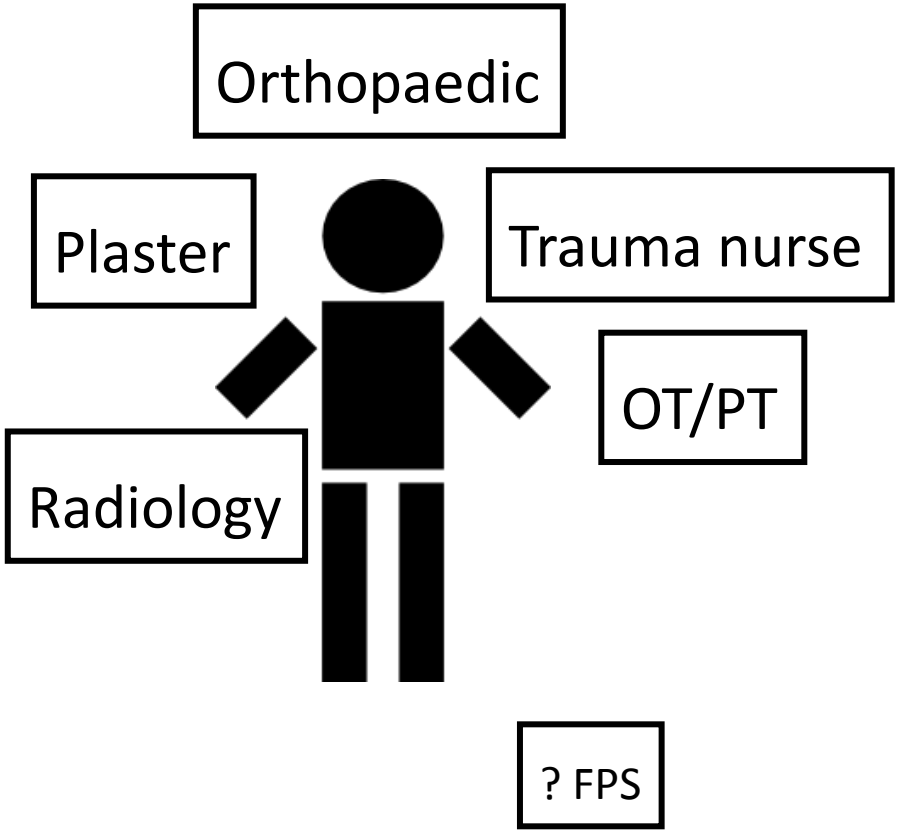
Re-fracture reduction

Critical First Impression Face to face

Commitment to ongoing Patient support

PILOT – how can it work in your hospital





What to pilot

Fracture clinic space

Ward assessment – when

Identification: ward/ clinic/ other

Bloods – where/ who / check results

DXA questionnaire/ outcome/ triage

Minimally disruptive Intervention

Oxford University Hospitals NHS NHS Trust

Trauma ward patient

Trauma clinic patient

Hospital based

UNDER 75 years

DXA

OVER 75 years

Assess & Treat

Community based

Assess & Treat

Recommend to Patient and GP

4 & 12 months Monitor

Identification

- Multiple methods
  - Ward / clinic direct
  - Administrative Lists
  - Hospital record

  - Audit to check

Investigation

- Patient vs. nurse administered questionnaire
  - Treatment threshold
  - Differential diagnosis
  - Treatment choice
- DXA triage
- Blood tests if osteoporotic
  - …. 23 versions over 4 years

Datahub Bloods DXA D/Charged Letter

Oxfordshire Fracture Prevention Service Assessment Form

Oxford University Hospitals NHS Trust

Vs 2.9 / 04.10.13 OxFPS

Signature …… Date of assessment ……..……New / FU

Patient sticker

JR□ Horton□
IP trauma□ IP other□
OPD trauma□ OPD spine□
ED□ Other□

Fracture Dte …. : **Age**.....yrs **Sex:** M / F Current/prev occ

Height.....cms **Weight**.....kgs **BMI**..... kg/m^2

Mental test:

AMT= /10

Cognitive impaired unable to assess Yes□ / no□; Discharged before assessed □

Current fragility fractures Yes□ No□ Reason NOT fragility:……..…..

1 Hip / Wrist / Vertebra / Other …… Right / Left

2 Hip / Wrist / Vertebra / Other …… Right / Left

3 Hip / Wrist / Vertebra / Other … ……..… Right / Left

Previous fractures Yes □ No □

Site	*Side*	*Fragility*	*Year*
1 Hip / Wrist / Vertebra / Other ……	Rt / Lt / Unknown	Yes / No	……..
2 Hip / Wrist / Vertebra / Other ……	Rt / Lt / Unknown	Yes / No	……..
3 Hip / Wrist / Vertebra / Other ……	Rt / Lt / Unknown	Yes / No	……..
4 Hip / Wrist / Vertebra / Other ……	Rt / Lt / Unknown	Yes / No	……..
5 Hip / Wrist / Vertebra / Other ……	Rt / Lt / Unknown	Yes / No	……..

Other risk factors

Back pain ……..…… Yes / No ….. Cervical / Thoracic / Lumbar

Pain on moving /10, radiation etc:

Loss of over 2 inches in height …… Yes / No **Kyphosis …**Yes / No

Family history of OP: No / yes closest:.....: hip□; kyphosis□; wrist□; other……/ Low BMD only

Menopause Age……Under 45yrs-Yes / No / DK Menarche Age Yrs

HRT until 45yrs Yes / No > 6m amenorrhoea Yes / No

FALLS ASSESSMENT: No. of falls, slips, trips in last 12 months=……. Bwd□ Fwd□ Side□

Gait: Indep□ Stick:1□ or 2□; Frame□; W/C□; Bedbound□

Fear of falling …… Yes / No	Need help getting up after falling Yes/ No
Balance / gait problems Yes / No …	Lose consciousness when fall Yes/ No
Confusion / wandering …… Yes / No ……	Urinary incontinence Yes / No
Previous referral to falls … Yes / No	Visual problems Yes / No
Date last seen ……	At risk medications for falling Yes / No

Current referral to falls service: Made□/ GP to review□ / pat declined□ / not req'd□

Needs Call alarm ; balance class ; OT home visit ; med review

PAST MEDICAL HISTORY

DVT / PE: Yes / No **Hypertension:** Yes/No **Angina/ MI**: Yes/N **Stroke:** Yes/No **PVD:**Yes/No **Chol**: Yes/No

Gastro-Intestinal: NO to all □	**Unexplained weight loss**	**Yes/No.....lbs over .....mths**
Abnormal swallowing ……..	*Yes / No Date* ……..	Coeliac disease Yes / No
Indigestion recent……	*Yes / No* ……..	*Frequency (daily/ weekly/ monthly)*…..
Gastric surgery Yes / No	Year of surgery.....	Upper GI ulcer Yes/No Date……
OGD Yes/ No Date.....	last result.....	PPI use: Current/Previously/No
IBD: Ulcerative colitis, Crohns …..	Yes / No	
Malignancy	**NO to all** □	
Breast cancer ……	Yes/ No …	Date diagnosed……
- Aromatase inhibitor ……	Current / Previously / No …	Dt start……..finished ……..
- Radiotherapy (DXT)	Yes/ No	Date last course.....
Prostate cancer ……	Yes / No …	Date diagnosed ……
- Androgen depletion ……	Current / Previously / No …	Dt start…….finished ……..DXT Y/ N
Other cancer: type ……	Current / Previously / No …	Date clear ……
OTHER: **NO to all** □	**Arthritis**: RA/ AS/ SLE/ Psa/ OA	
Anorexia nervosa: No/ Yes: low cal / exercise / laxative / emetic		Onset age: _____
Depression Current / Previously / No	Parkinsons Yes No	Epilepsy…Yes/ No. …DRUG:
Chronic kidney failure /Stones……	Yes / No (yr last stone:)	Renal consultant:
Diabetes No/ type..I / type II	Thyroid-No/ hyper / hypo	Hyperparathyroidism …..Yes/ No
Current Dentition concerns …… . Yes / No		
Asthma/COPD Yes/No	Steroids: inhaled/oral	

MALE HYPOGONADISM SYMPTOMS: NO/ reduced libido, impotence, less shaving; DATE onset:

OTHER

FRAX - Major fracture= Hip fracture=

Parental hip fracture < 90 years ……	Yes / No
Smoking ……	Never/ Current / Ex-smoker moked.....) [pack yrs.....]
Alcohol intake over 3 units / day ….	Yes / No
Ever Oral steroid use over 3 months	Yes / No / Current ……. Year last used ……..
Rheumatoid arthritis ……	Yes / No
Secondary osteoporosis * ……	Yes / No
Date last DXA ……	LS T= ……..... FN T= …… TH T = ……

*Type I (insulin dependent) diabetes, osteogenesis imperfecta in adults, untreated long-standing hyperthyroidism, hypogonadism or premature menopause (<45 years), chronic malnutrition, or malabsorption and chronic liver disease

DIETARY CALCIUM INTAKE **EXERCISE:**

Milk None <1/3 pt 1/3pt 1/2pt 2/3pt 1pt 1½pt Other Calcium…….Yes/No

Ca(mg) 0 100 200 300 400 600 900

Servings of dairy (not including milk) per day:

0 1 2 3 4+

Ca (mg) 0 200 400 600 800

Ca intake: replete□(> 800mg)**; low**□ (<800mg)

SKIN TYPE:

Very light (always burns) Light (mostly burns) Dark Europe (mostly tans) Olive Brown Black

Do you use sun screen when you should?

Never Sometimes Usually Always Avoid Sun

Initiation: A therapy for every patient

ORAL

Alendronate 70 mg weekly (£11.44)

Risedronate 35mg weekly (£15.21)

Ibandronate 150 mg monthly (£18.98)

Strontium 2g nocte (£353)

Calcium replete

Vitamin D replete

HRT/ Raloxifene

Zoledronate 5mg iv annually (day case rate)

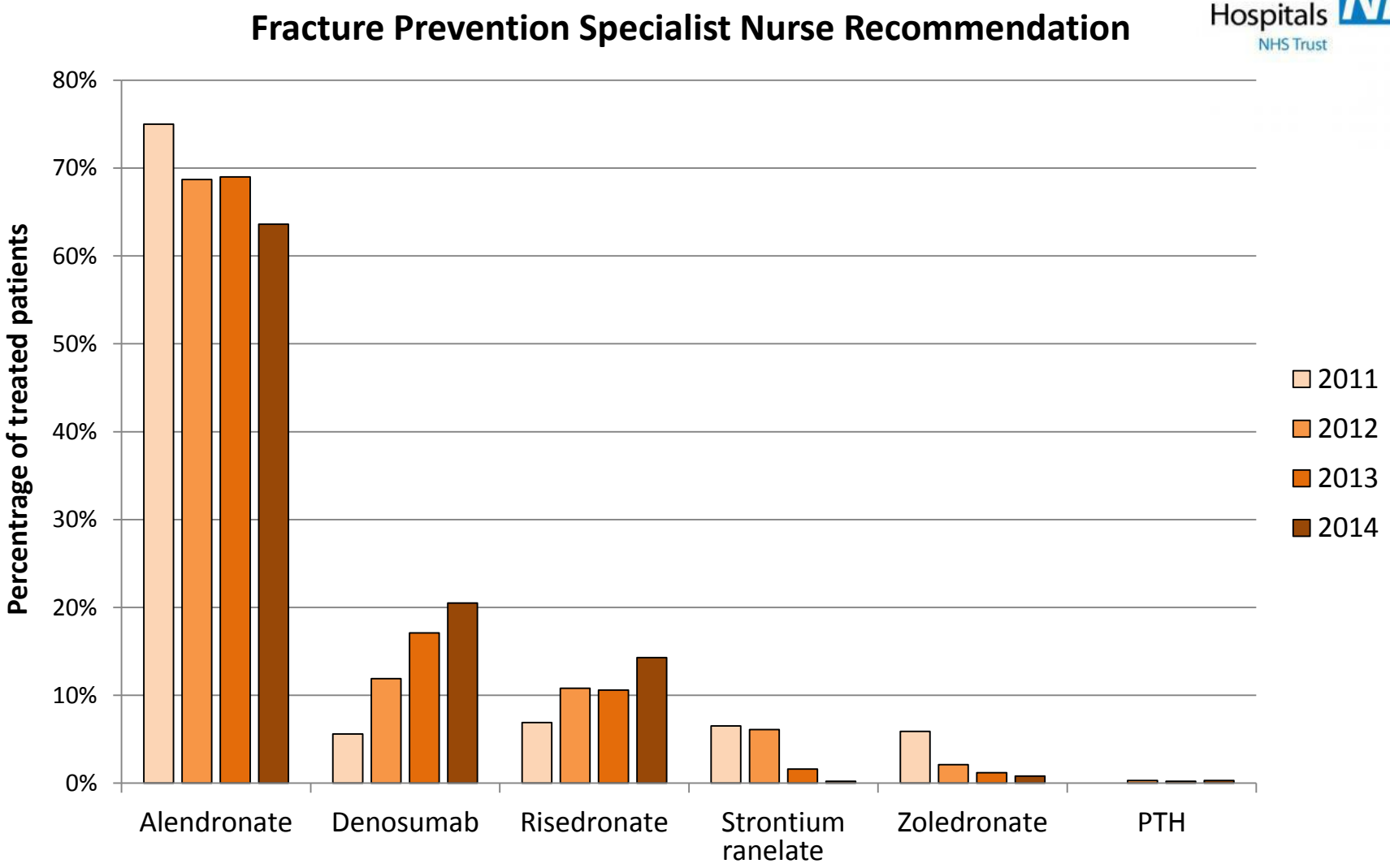
Denosumab 60mg sc 6m (£366)

Teriparatide 20mcg od s.c (£3263)

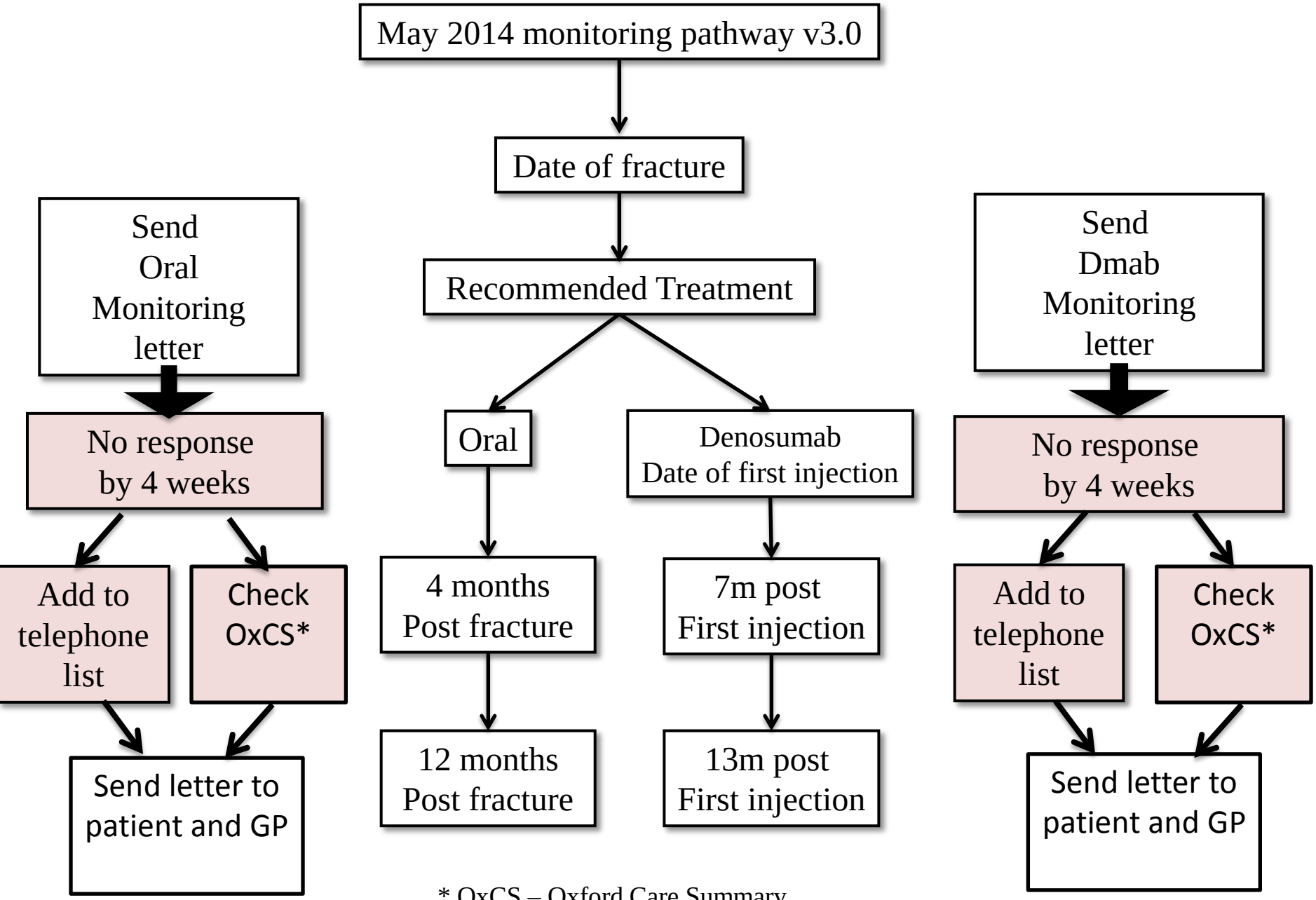
Treatment adherence – options with parenteral therapy

Treatment Recommendation (n=4,013)

Oxford University Hospitals NHS Trust

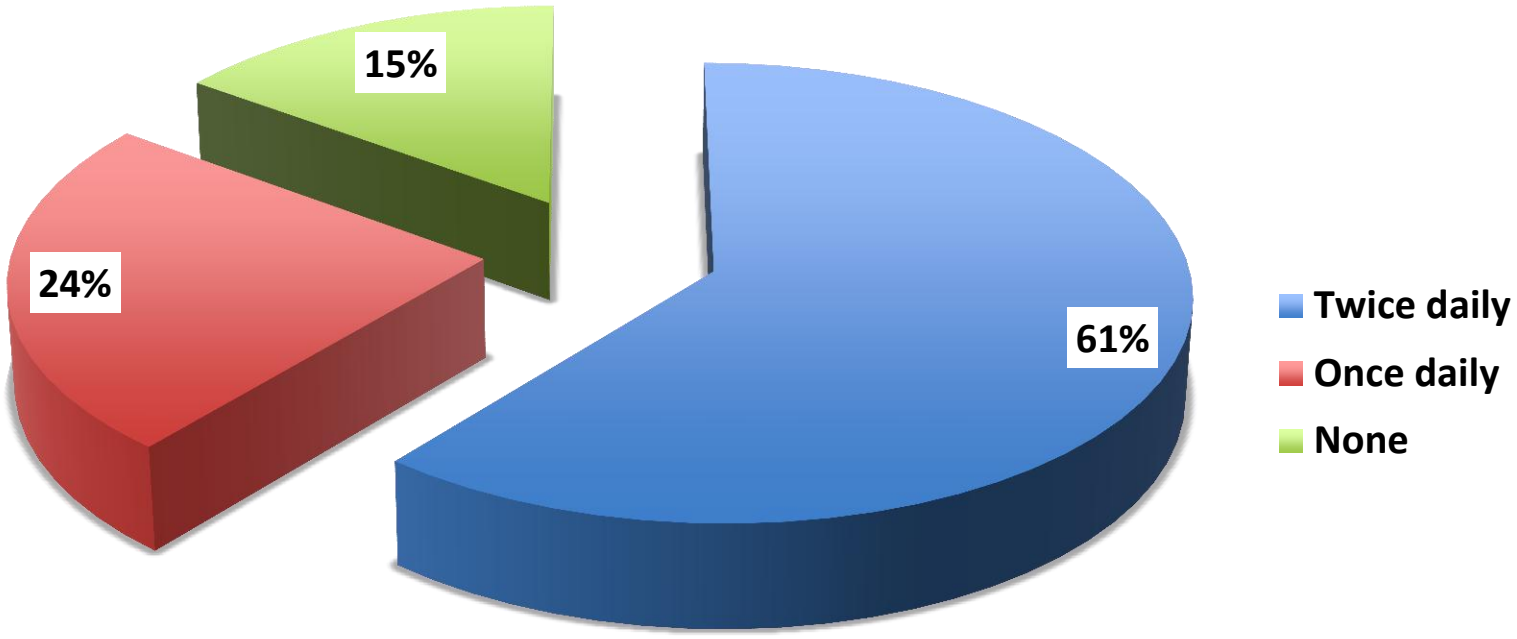


Systematic application of NICE TA 161



* OxCS – Oxford Care Summary

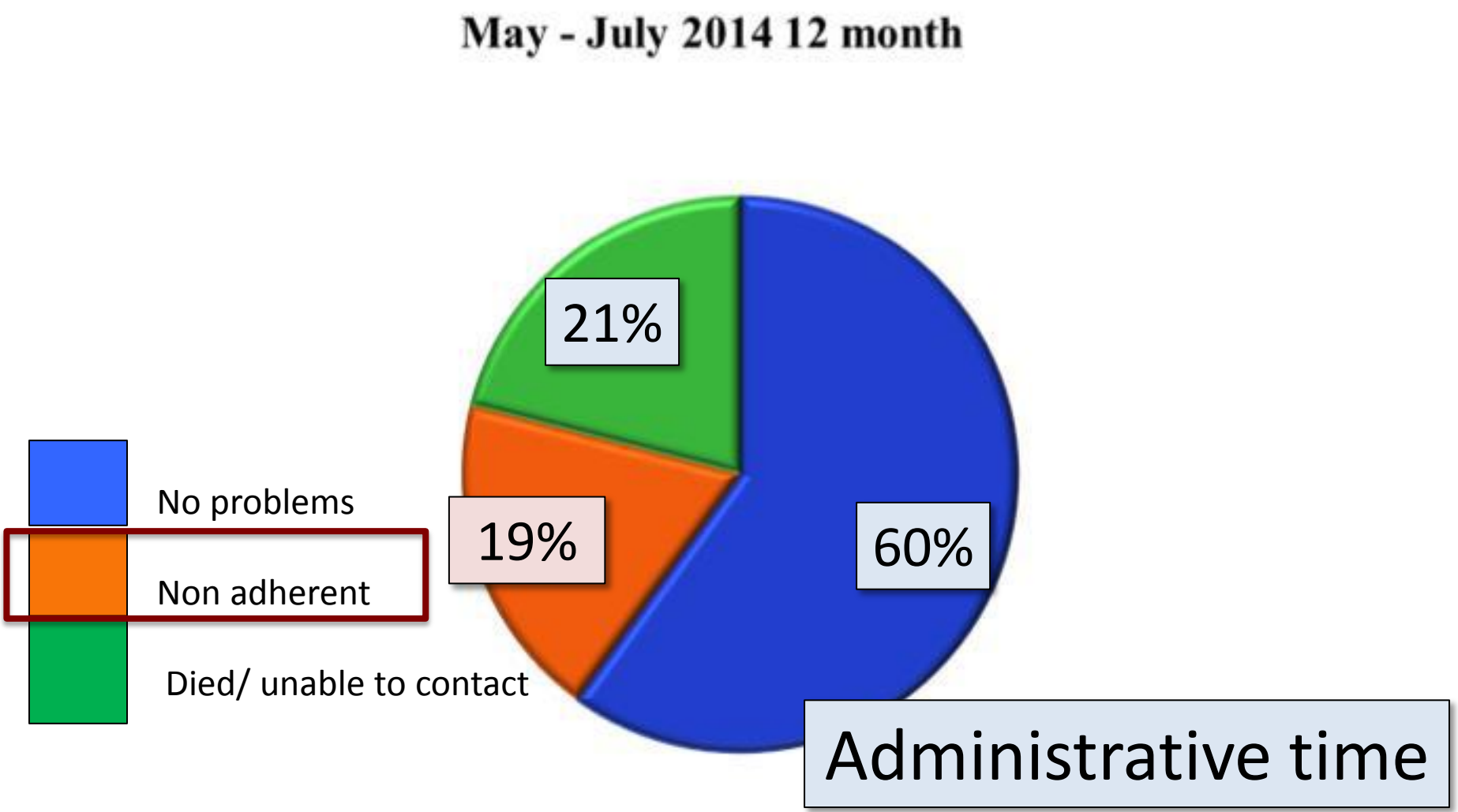
Outcome: Calcium



Adcal BD @ £48.80/ year (-£58,316)
507fultium @ £43.83 (+£22,221)

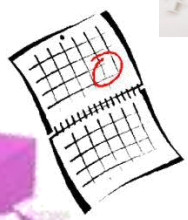
Saving of £36,095

Reported adherence at 12 months



Information streams

ELFIN: Datahub assist



Oxford University Hospitals NHS

Welcome Kassim Javaid
Log on to
ElFin

Log On | Quit

[Elfin system](#)

www.elfinhub.org

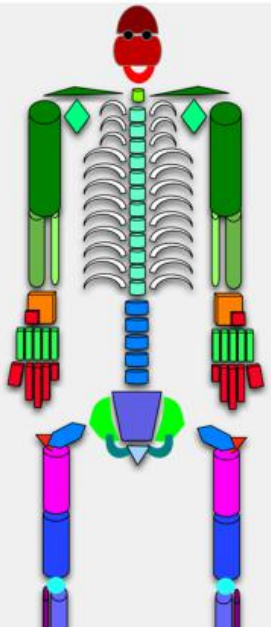
GOOOSE, mother | Born 02-Feb-2033 (-7372 days) | Gender Female
Hospital Number 222222 | NHS Number 2222222222

Quit Admin
Find Patient Search Database Add New Patient

In Progress | Add New Form | Contents | Patient Record | Summaries | Enter Patient Data | Letters | Pathways | Care Setting: Nuffield Orthopaedic Centre

26-Nov-2012 - Bone and Falls

Delete | Reset | Finalise | Save | Print



Date of fracture	Fracture Site	Type	Trauma level	Current	Associated life event
2012				Yes	
2010				No	stroke
2009				No	
2000					
2000	T5	Fragili			
1990	Left Humerus	Fragili			

Designed by FLS for FLS
Templated letters
Multiple outputs

EPR agnostic
Approved clinical care record
Open source design

9000 patients transferred
Active in Oxford

Falls and Balance

No of falls, slips, trips over 12months	5
When you fell fell what were you doing?	From sitting
Were any of these falls indoors?	☑
When you fell did you land on your...	Bottom
When you last fell was there an external reason? (eg a dog)	no/spontaneous
Fear of falling	◉ **Yes** ○ **No** ○ **Dont Know**
Balance or gait problem	○ **Yes** ◉ **No** ○ **Dont Know**
Confusion or wandering	○ **Yes** ◉ **No** ○ **Dont Know**
Urinary incontinence	◉ **Yes** ○ **No** ○ **Dont Know**
Visual problems	○ **Yes** ◉ **No** ○ **Dont Know**
At risk medication for falling	☑
At risk medication for falling detail	atenolol
Number of nocturia	3

Data input once

Cost Effectiveness

Output many times

- Audit & reporting
- Referrals & Requests
- Research
- Patient recall
- GP letter
- Patient information

Oxford University Hospitals NHS
NHS Trust

NHS: 0123456789
Date: 12/06/2012

Oxford Fracture Prevention Service
Nuffield Orthopaedic Centre
Windmill Road
Oxfordshire
OX3 7LD

Tel: 01865 227 647
Fax: 01865 227 524
Email: ox.osteo@nhs.net

Jane Smith
Mainstreet
Sometown
AB1 2CD

Dear Ms. Smith,

You were recently seen by Specialist Nurse Kerri Rance from the Oxford Fracture Prevention Service after your fractured your Wrist. This letter is a summary of your treatment plan.

	Low	High	
Your risk of another fracture is:		▲	Or 17%
With treatment this could be reduced to:	▲		Or 9%

What now?

1. For more information about your treatment choices please see overleaf.
2. Please make an appointment with your GP and bring this letter to arrange your prescription.
3. We will contact you in 3 months to see how you are doing

What if I have a problem?

You can contact:

1. Your GP – especially about medication problems
2. Your local National Osteoporosis Society Support Group on 01865 872628 or email NOS.Oxfordshire@gmail.com especially for support.
3. You can also contact us on the details on the top of the page.

Signed: Kerri Rance

Patient Engagement

What are my choices to reduce my fracture risk?

The most important choices for you are:

Alendronate is a medication taken once a week. Please read the information leaflet carefully as it is important you follow the instructions exactly to get benefit from your treatment. You should continue this treatment for 10 years. We have asked your GP to refer you for a repeat DEXA scan in 5 years time.

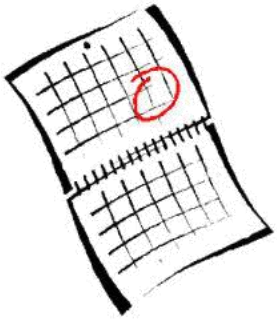
You need calcium to make sure your medication works to strengthen your bones. Your calcium intake from your diet is low, please read the diet information we have enclosed. If you cannot manage 1000mg per day then we suggest your GP prescribes one or two Calcium and Vit D tablets per day.

Vitamin D is needed for your medication to work to strengthen your bones. Your level is below normal and we suggest you purchase high strength Vitamin D from your local pharmacy or health food store. Take one per day as the instructions. If you have been recommended Calcium and Vitamin D tablets as well, continue with them in addition to these new tablets.

This was a one off fall and therefore no Falls Service referral is needed at this stage.

You do not smoke.

Alcohol: You do not drink regularly and we simply recommend you continue to drink no more than the recommended number of units per week. .



Systematic Active Monitoring:

Patient Safety

NON Adherence

Adverse events

NON response/ re-fracture

Therapeutic Tailoring

Effective fracture reduction

Did it work?

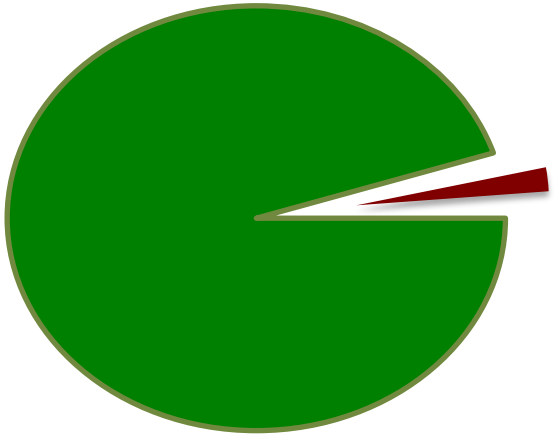
Amount of information:

88% right amount

11% Not enough

1% Too much

Nurse able to answer Questions?



99% YES

Would you recommend to friends and family?

89% YES

The team

Lead Practitioner

Specialist Practitioners

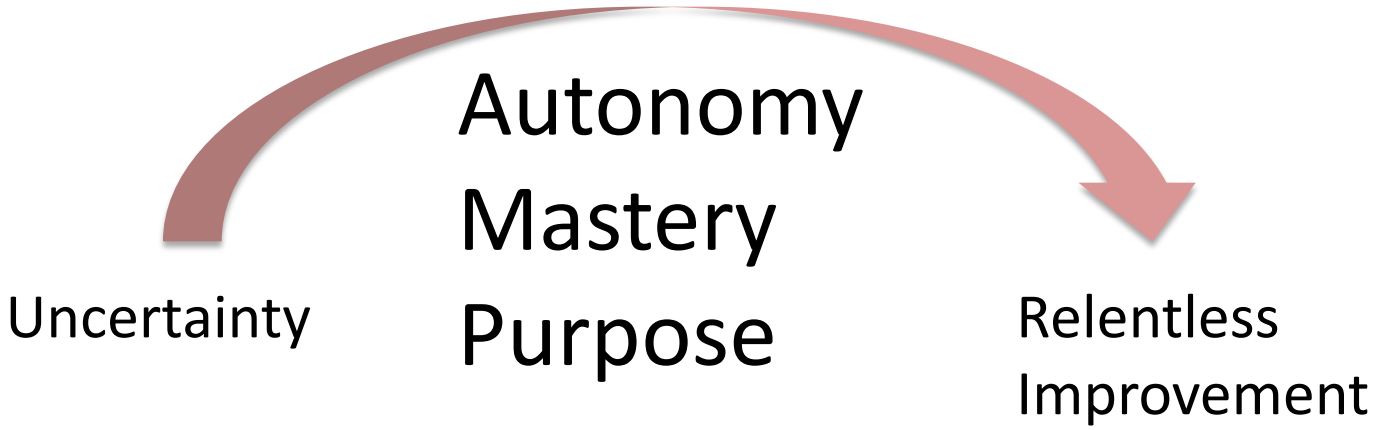
Project Manager

Administrators

Service support costs; space; IT; printer; DXA scans; phlebotomy

Staff

- 2 week induction
- Graduated introduction
- Duration of contract limited to <18 months



Fracture Prevention Practitioner Training

Foundation and Advance level

National Osteoporosis Society

4 Distance-Learning CPD credits

Annual re-validation

Quality Assurance

Multi-media resources

£50 certification fee

Online training

Evidence of training & competence

Formal accredited exam

Accredited by RCP & RCGP

Improve clinical outcomes

Intelligent Staff appointments

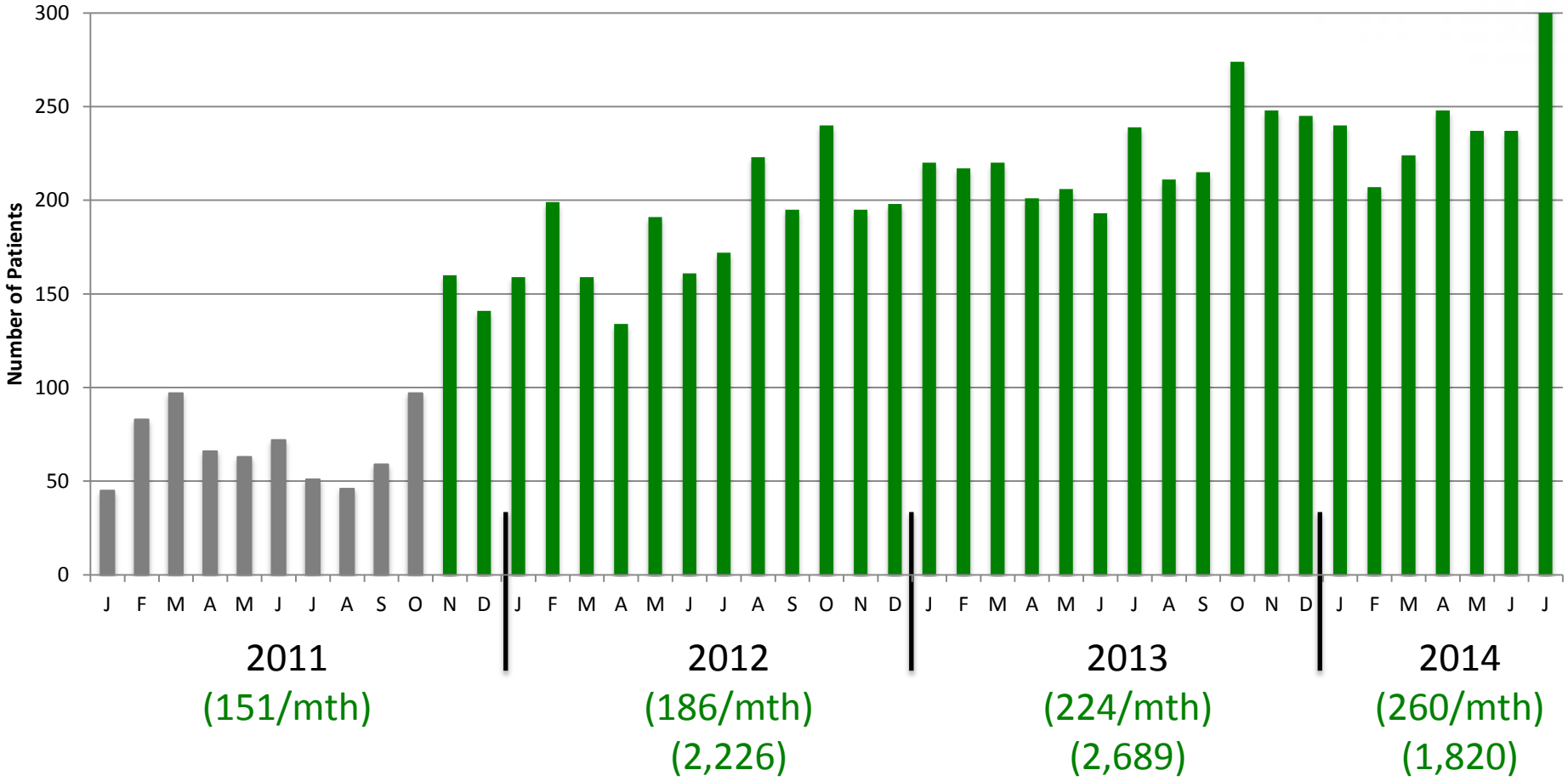
- Choose x2 0.6 over 1 WTE vs 1 WTE gives continuity

- Mandatory training
- Annual / study leave
- Term time
- Other roles – senior nurse bleep holder
- Travel to clinics

- Plan for succession planning / turnover of staff
  - 3 pregnancies + 2 promotions
  - Short term secondments do not work
  - Make your service attractive to work for!

Plan for the peaks in activity

Oxford University Hospitals NHS Trust



4 WTE nurses + 1.75 admin + Elfin

620,000 population

3 hospitals

N= 12,000

5 years Oxford economic 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**

UK National Osteoporosis Society Economics Benefit Calculator 2014

Next step

Trauma ward patient

Trauma clinic patient

Pelvic fracture
Medical patient

Spine fracture
General patient

UNDER 75 years

DXA

Assess & Treat

OVER 75 years

Assess & Treat

Recommend to Patient and GP

Monitor for 5 years

Falls & Generations Game

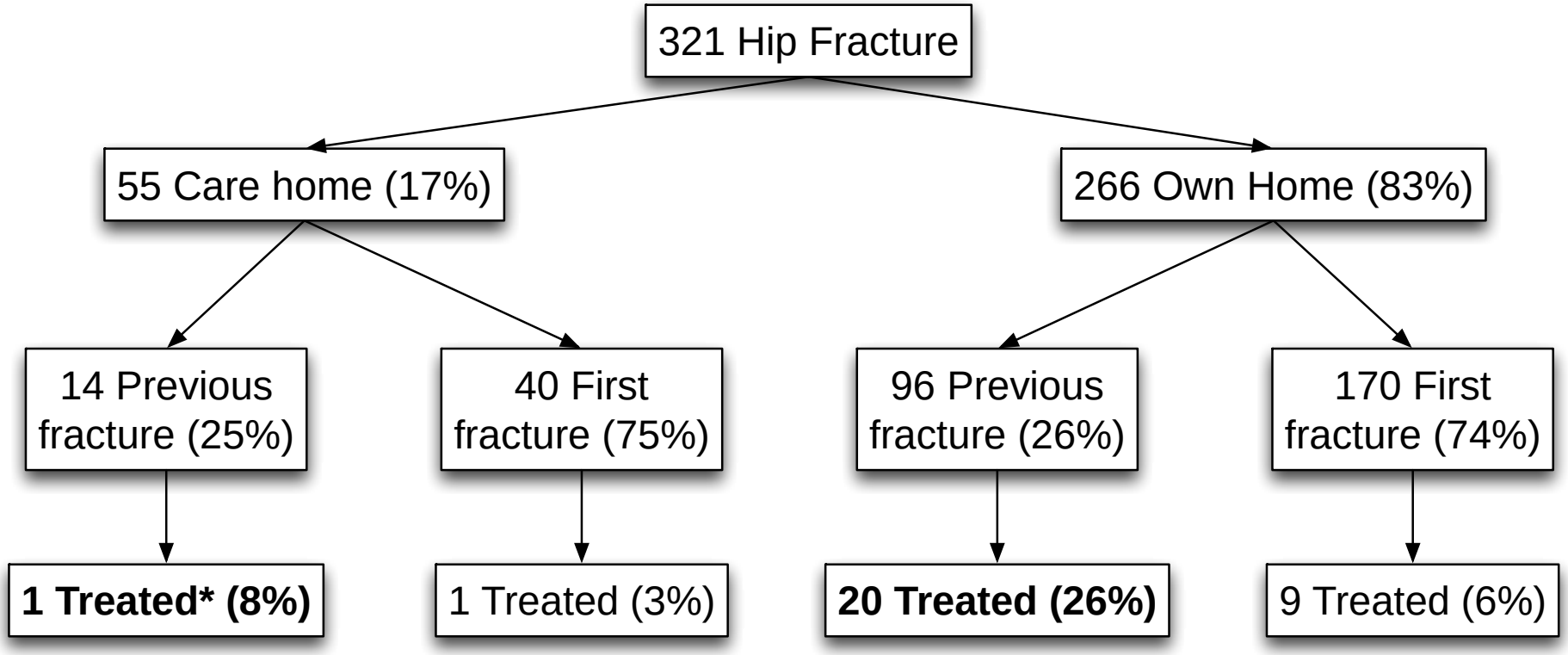
National Osteoporosis Society

Care Home

Dementia

Renal Care

Care home patients:



*Strontium mixed with feed

Denosumab > **Green** with FPS monitoring

Other questions

How big a service do I need?

To see and assess the patients?

- Ward patients
- Orthopaedic
- Geriatric
- Medicine
- Hospital(s)
- Clinic patients
- New patient
- Emergency room

Recommend
or
Initiate treatment?

To monitor the patients?

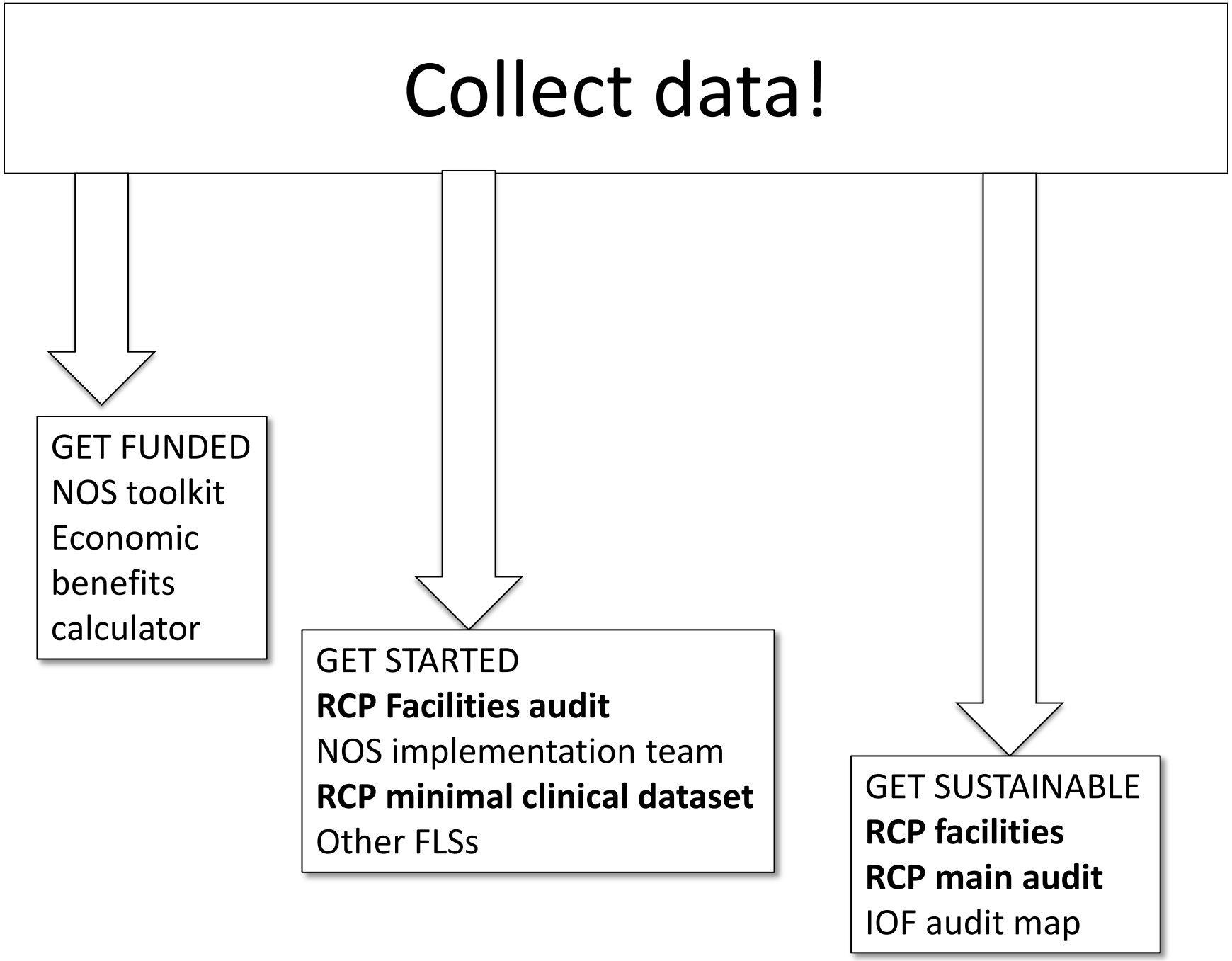
- Prescribing records
- Letter
- Telephone
- Email
- Clinic

To reduce re-fracture rates?

Leave to primary care
variability in care delivery

Test other pathways
- Early review if failing

Leave to orthogeriatrics for hip fracture
? monitoring


Collect data!
GET FUNDED
NOS toolkit
Economic benefits calculator
GET STARTED
RCP Facilities audit
NOS implementation team
RCP minimal clinical dataset
Other FLSs
GET SUSTAINABLE
RCP facilities
RCP main audit
IOF audit map

Share good practice

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

Patient + Effective Care pathway = Reduce Avoidable Fractures

Data that the FLS has closed the care gap

BRC

NHS National Institute for Health Research

UNIVERSITY OF OXFORD

FRiSCy

MRC Epidemiology Resource Centre

UNIVERSITY OF Southampton

Kristina Akesson (Sweden)
Cyrus Cooper (UK)
Mark Edwards (UK)
Charlotte Moss (UK)
Alastiar McLellan (UK)
Paul Mitchell (NZ)

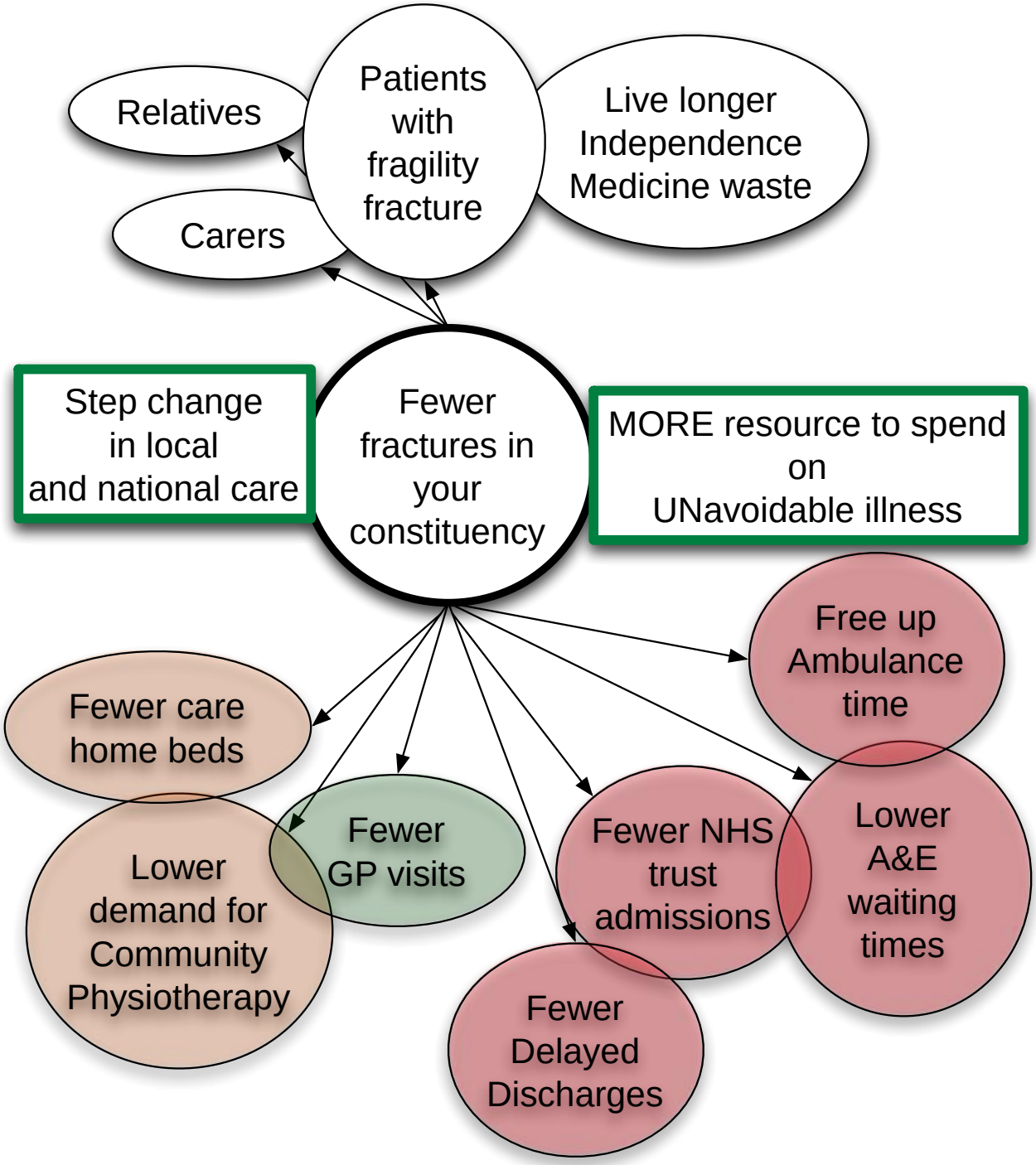
(Carey Kyer)
Muriel Schneider
Dominique Pierroz
Judy Stenmark

International Osteoporosis Foundation

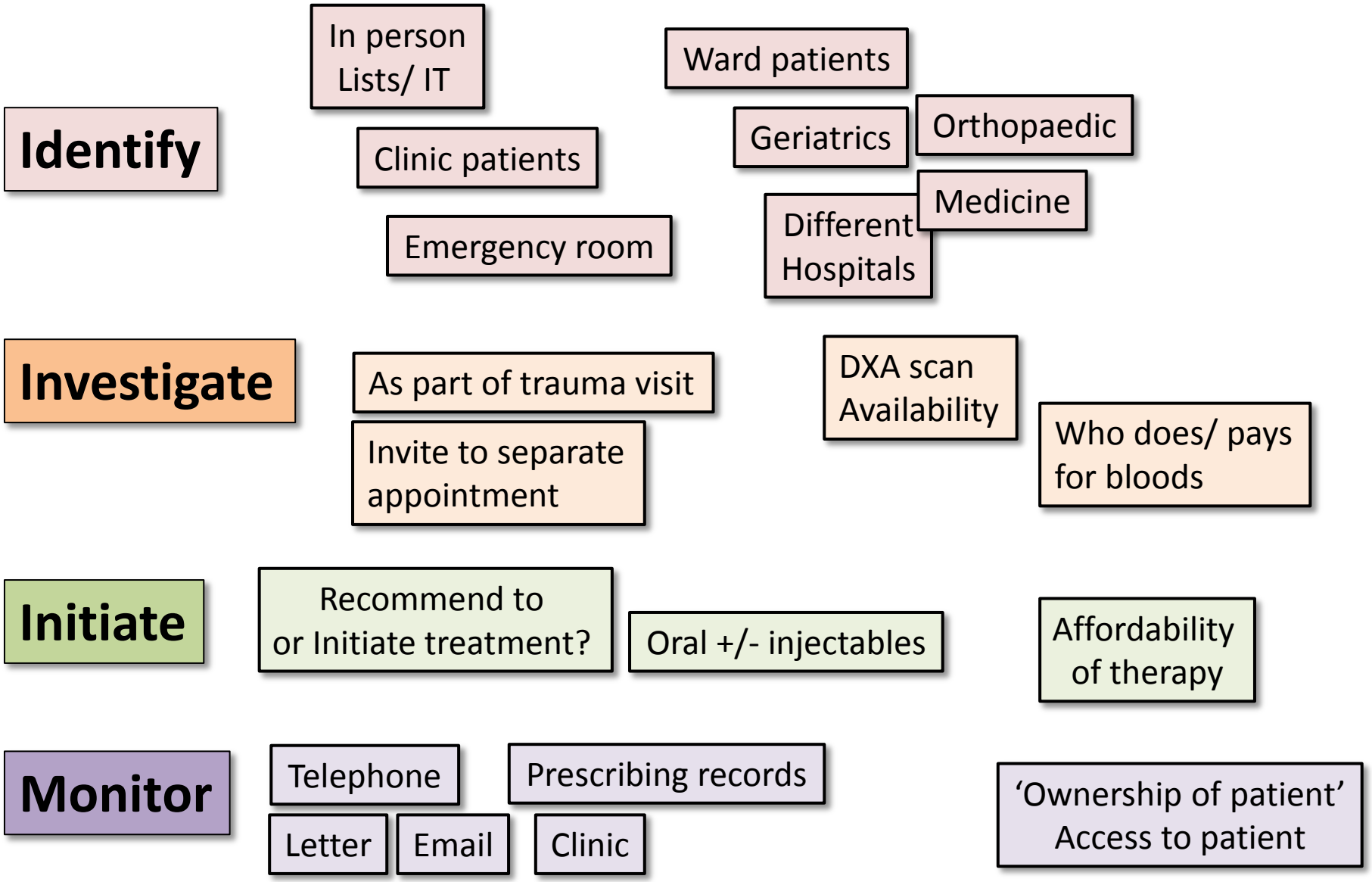
Academic Team
Cooper, Wass, Willett, Arden, Carr
D Prieto Alhambra, A Judge, S Hawley, R Batra,
G Round, A Kiran, K Leyland, A Soni, R Warne

CAPTURE *the* FRACTURE

Kerri Rance
Sally Hope
Sarah Connacher
Terri Morgan
Carol Weeks
Rachael Knight
Vivienne Fairclough
Tracy Dobbin
Elaine Arthur


Relatives
Patients with fragility fracture
Live longer
Independence
Medicine waste
Carers
Step change in local and national care
Fewer fractures in your constituency
MORE resource to spend on UNavoidable illness
Free up Ambulance time
Fewer care home beds
Fewer GP visits
Fewer NHS trust admissions
Lower A&E waiting times
Lower demand for Community Physiotherapy
Fewer Delayed Discharges

Local decisions for an FLS



0 – start

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
Local NOS

0 – start

1. Estates / Space> team/ clinics
2. Hospital Id card
3. Hospital path / results
4. Trauma – ward / clinic
5. DXA
6. Metabolic medic referral

6 month project manager

7. Marketing: GP, Hospital,

Start to first 3 months

1. Review service
2. Review staff & mentoring & training
3. Review metrics
4. Team governance

5. Team development
6. Renewal

1. Maternity leave
2. Secondment

Intelligent Staff appointments

- Choose x2 0.6 over 1 WTE vs 1 WTE gives continuity

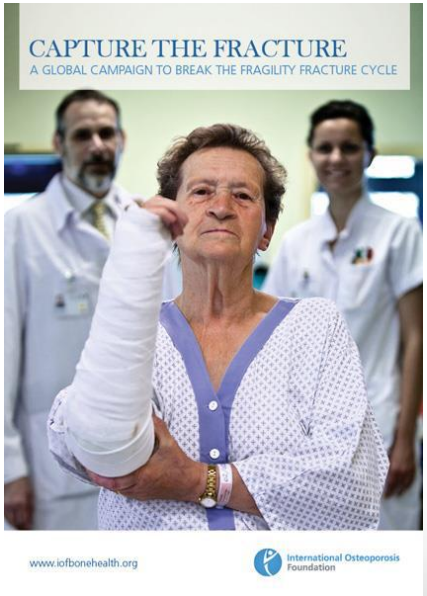
- Mandatory training
- Annual / study leave
- Term time
- Other roles – senior nurse bleep holder
- Travel to clinics

- Plan for succession planning / turnover of staff
  - 3 pregnancies + 2 promotions
  - Short term secondments do not work
  - Make your service attractive to work for!

Falls: the first 6 months

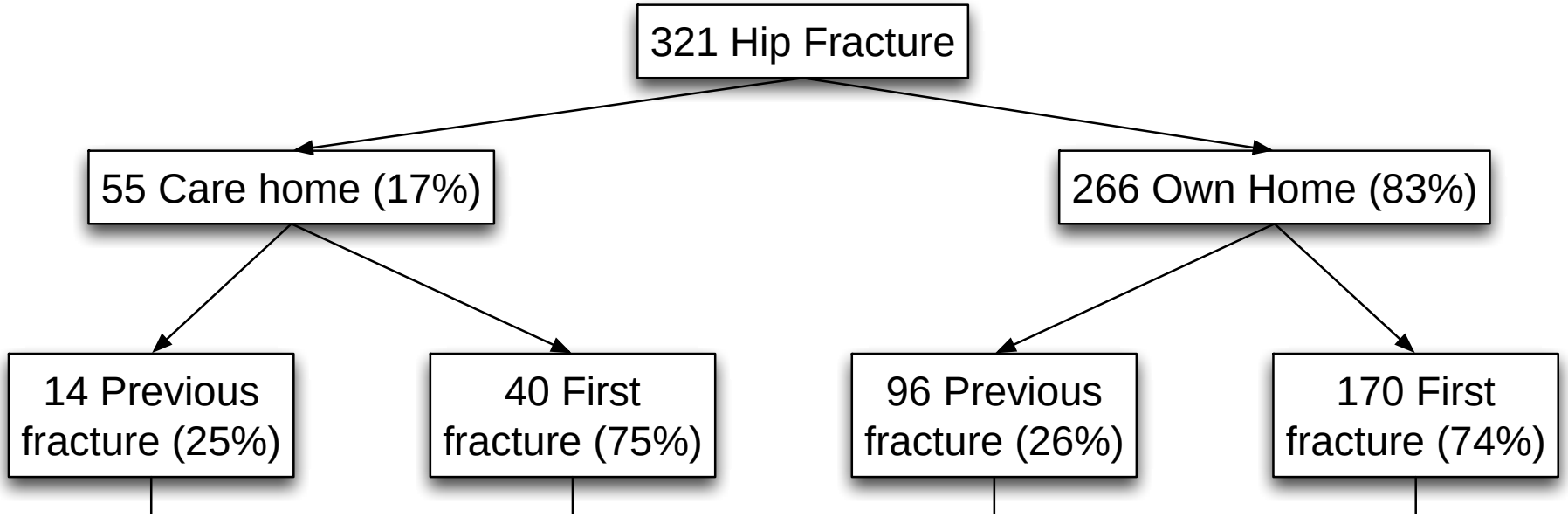
G) FALLS Risks: None□ / No. of falls, slips, trips in last 12 months=……..	
Gait: Indep□ Stick:1□ or 2□; Frame□; W/C□; Bedbound□;	
Any Indoor falls□	History of possible syncope: Probable□ No□
Details of current Fall (contributory/ landed on)	
Need help getting up after falling□	Fear of falling□ Balance/gait problems□
Confusion / wandering□	Loss of consciousness□
Urinary incontinence□ Visual problems□	At risk medications for falling□
Times nocturia=	Foot pain: Never□ Sometimes□ Often□ Most time□
Prev referral to falls□ DK□	Date last seen ……
Prev referral to strength/ balance□ DK□	No. Hrs/wk of recommended exercise done in the last month before fracture =

Audit:
Patient Perspective

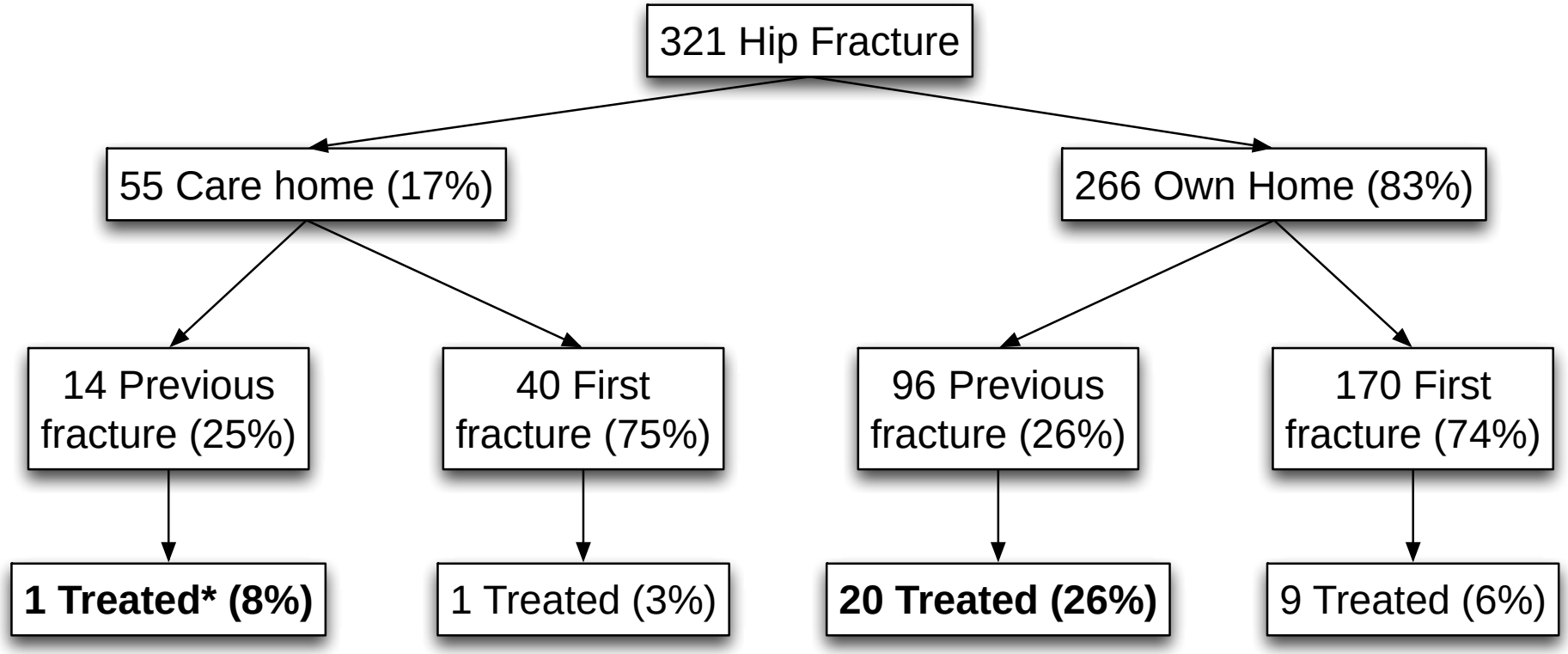


Will I receive Effective Secondary Prevention?

Care home patients:



Care home patients:



*Strontium mixed with feed

ADDRESSING THE CARE GAP IN SECONDARY FRACTURE PREVENTION IN A SINGAPOREAN HOSPITAL: “OPTIMAL”

Manju Chandran, M.D, FACP, FACE, FAMS

Senior Consultant and Director, Osteoporosis and Bone Metabolism Unit, Department of Endocrinology, Singapore General Hospital

Singapore

- Population: 5.4 million
- Multiethnic
- Chinese (74.2%), Malays (13.2%) Indians (9.2%) and others (3.4%)
- 100% urban
- Health Care financing: Twin philosophies of individual responsibility and affordable health care to all
- Subsidies on health care: Provided through general taxation and through nationalized compulsory health insurance plan- Medisave that can be used for chronic diseases and hospitalization bills
- 70-80% of Singaporeans obtain their medical care within the public health care system
- Primary health care provided by mix of 18 polyclinics and 2000 private GP's

Singapore Population census 2013

Singapore

- **Osteoporosis is major public health problem**
- **Number of people aged 65 and older will triple from 350,000 today to 960,000 in 2030**

Htttp://www.singstat.gov.sg

- FRAX ® model exists for all 3 major ethnic groups.
- 27 DXA machines for the population of 5.4 million
- Osteoporosis is recognized by the Government as a National Health Priority.

Post Fracture Osteoporosis Management Models

- **Breaking the „ fragility fracture cycle“ is an international challenge**
- **Interventions based on public and health care education alone unlikely to improve osteoporosis management**
- **Many feasible models possible**
- **Models based on Clinician Champion + Coordinator involvement circumvent the challenge of where clinical responsibility resides for care of the fragility FX patient**
- **Cost of antiosteoporosis treatment has to be factored in especially in countries where health care is largely self pay**

RA Adler et al. Osteoporos Int (2011) (Suppl 3):S495-S500
D Marsh et al. Osteoporos Int (2011) 22:2051-2065

OPTIMAL

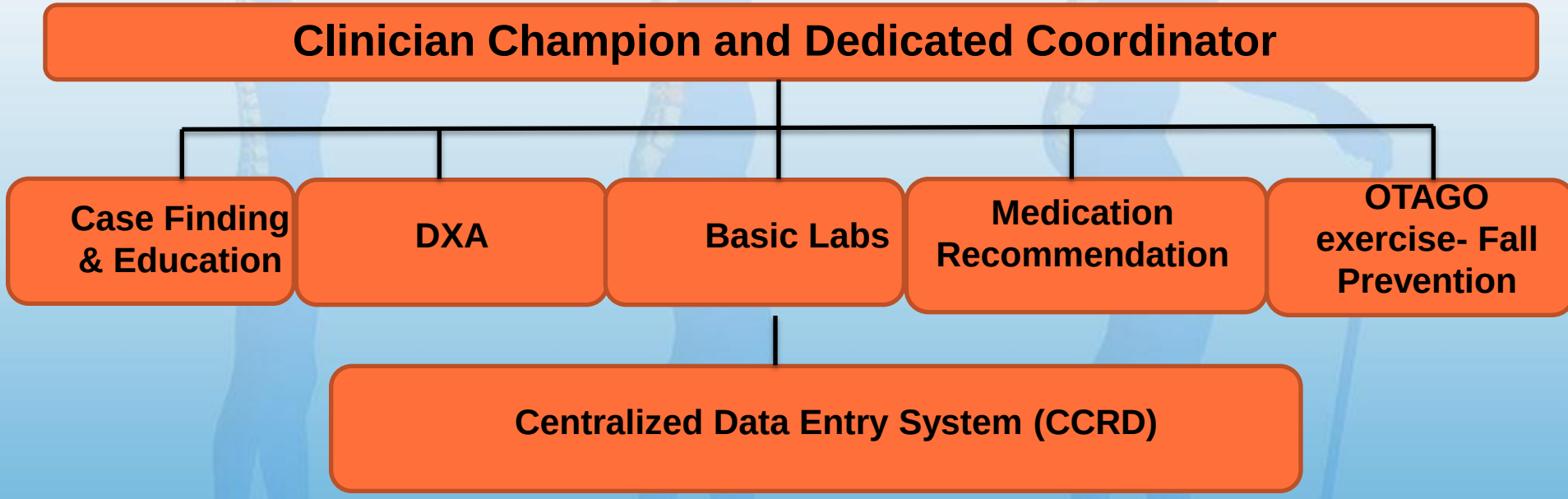
Osteoporosis Patient Targeted and Integrated Management for Active Living

- MOH Funded
- 7 Government Hospitals and 18 Polyclinics
- Age more than 50 years, male or female
- *Fragility Fracture
- Able to comply with intervention and follow up for 2 yrs

* Exclude skull, below ankle and beyond wrist

OPTIMAL

Osteoporosis Patient Targeted and Integrated Management for Active Living



*Structured OTAGO exercise program (balance and strengthening): 10 one hour sessions over 6 weeks followed by recommendations for continuing at home/community gym or individual PT over the next 2 years

Highly Facilitated program

Background to OPTIMAL

- Pilot HSDP Project on Osteoporosis Management : 2003-2007
- 1069 patients recruited from 3 hospitals across Singapore
- Audit conducted prior to HSDP Project: Only 16% of patients on appropriate anti osteoporosis treatment after sustaining a fragility fracture
- Improvement to 44.9% after implementation of HSDP
- Overall reduction in fracture rate:42.4%

How did we set it up?

- Identified the problem
- Who would take charge? –Clinician Champions
- Examined whether we should start from scratch or whether there were facilities and resources already available at each public hospital

Our Proposal--

- **Allied with Key Strategic Directions of MOH**

  - Risk Stratification

  -Evidence based Guidelines

  -Case Management

  -Outcomes tracking

- **Key Performance Indicators: Volume Indicators and Clinical Indicators**

  - A reduction in patients who have recurrent fractures since sustaining the first fracture within the 2 year period (40% reduction, including hip fracture)

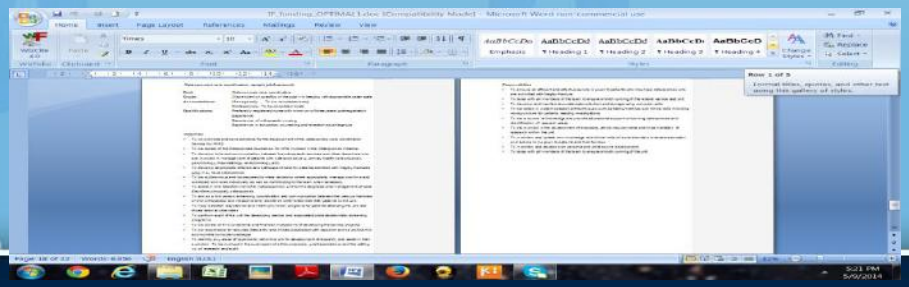
  - An increase in the proportion of patients who have evaluation of osteoporosis and assessment of future fracture risk after sustaining a fracture, and had received appropriate treatment when indicated. (85%)

  - Adherence to treatment (70%)

- **Expenditure and Income Projections**

Armed with the preliminary data and this proposal we lobbied MOH (for health care funding)and top level management at individual hospitals for setting up the program

- Hired Case Managers with clear Job Descriptions



NOT FOR THE FAINT OF HEART!

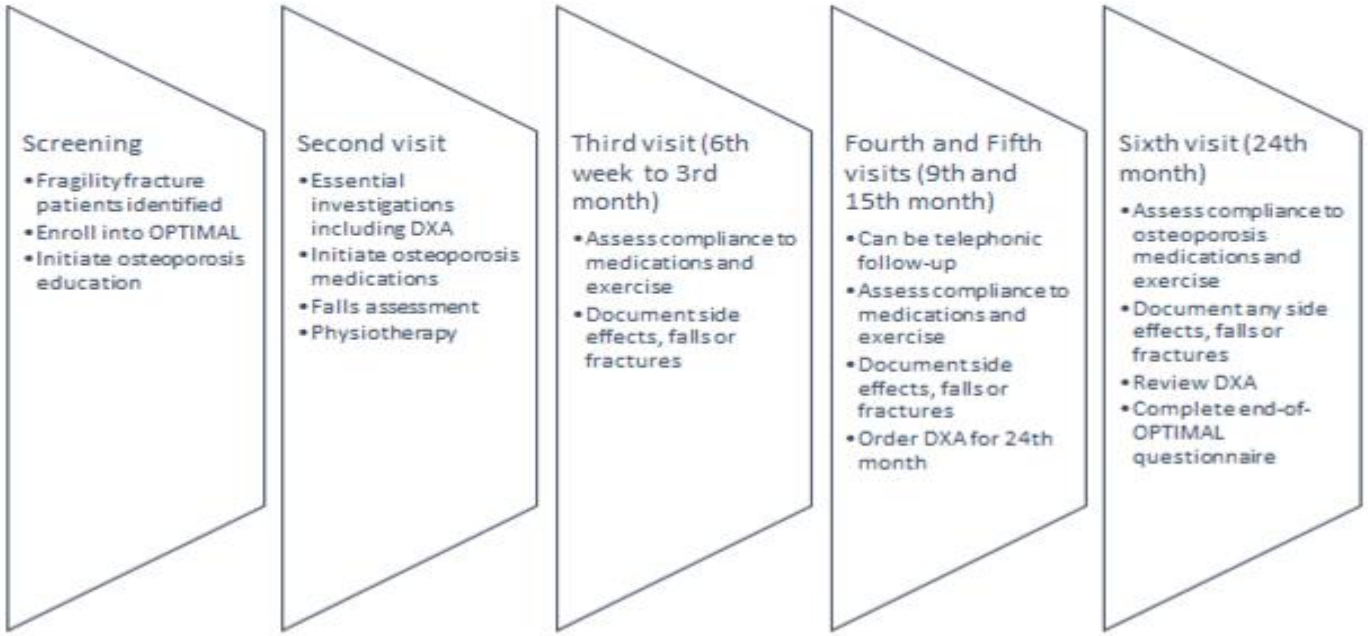
THE PATH- HAS NOT BEEN EASY!

OPTIMAL AT SGH

- **SGH: Largest tertiary teaching hospital in SE Asia:1590 Beds**
- **Estimated number of osteoporotic fractures seen annually: 1500**
- **SGH Osteoporosis Prevention and Treatment Initiative already initiated and Hip Fracture pathway updated at time of OPTIMAL implementation in 2008**
- **Most number of Departments involved in “buy in” for OPTIMAL**
- **Most number of patients screened and recruited, and currently in follow-up**

Patient with fragility fracture (any time after age 50 or new #) identified either by thrice weekly perusal of A&E fracture record, referral from Specialist OP clinics or wards

Figure 1: Work Flow of OPTIMAL showing follow up visits



COSTS

Non-Recurrent Costs:

- Initial training of personnel (Case Manager/Physiotherapist/ IT)
- Initial purchase of Equipment (Laptops/ Data entry software, Physiotherapy (Falls assessment) equipment)

Recurrent Costs

Manpower

Rental of facilities/room

Operation Cost (Administrative support)

[Medication subsidy if any

Cost of Investigations and DXA subsidy if any]

OPTIMAL at SGH

7137 patients screened to date

Patients with prior fragility fractures after age 50

Patients with new fragility fractures

1820 patients with fragility # recruited so far

Male or Female age>50 years old

Agreed to participate in the program and able to comply with intervention and follow up

98% of above patients had baseline DXA and 64.3 % had baseline and 2 year follow up DXA scan

Mean MPR : 72.8+/-34.5 % at 2 years
Proportion of patients with MPR >/=80% at 12, 18 and 24 months were 83, 75 and 50% respectively

Osteoporos Int
DOI 10.1007/s00198-013-2368-8

Secondary prevention of osteoporotic fractures—an "OPTIMAL" model of care from Singapore

M. Chandran · M. Z. W. Tan · M. Cheen · S. B. Tan · M. Leong · T. C. Lau

Adherence to osteoporosis medications amongst Singaporean patients

M. H. H. Cheen · M. C. Kong · R. F. Zhang · F. M. H. Tee · M. Chandran

Commentary

Secondary Fracture Prevention: Plucking The Low Hanging Fruit

Manju Chandran, [1,2,3] FRCP, FRCE, FRMS, Kristina Akesson, [4,5] MD, PhD

Fracture Liaison Services in an Open System: How was it Done? What Were the Barriers and How Were They Overcome?

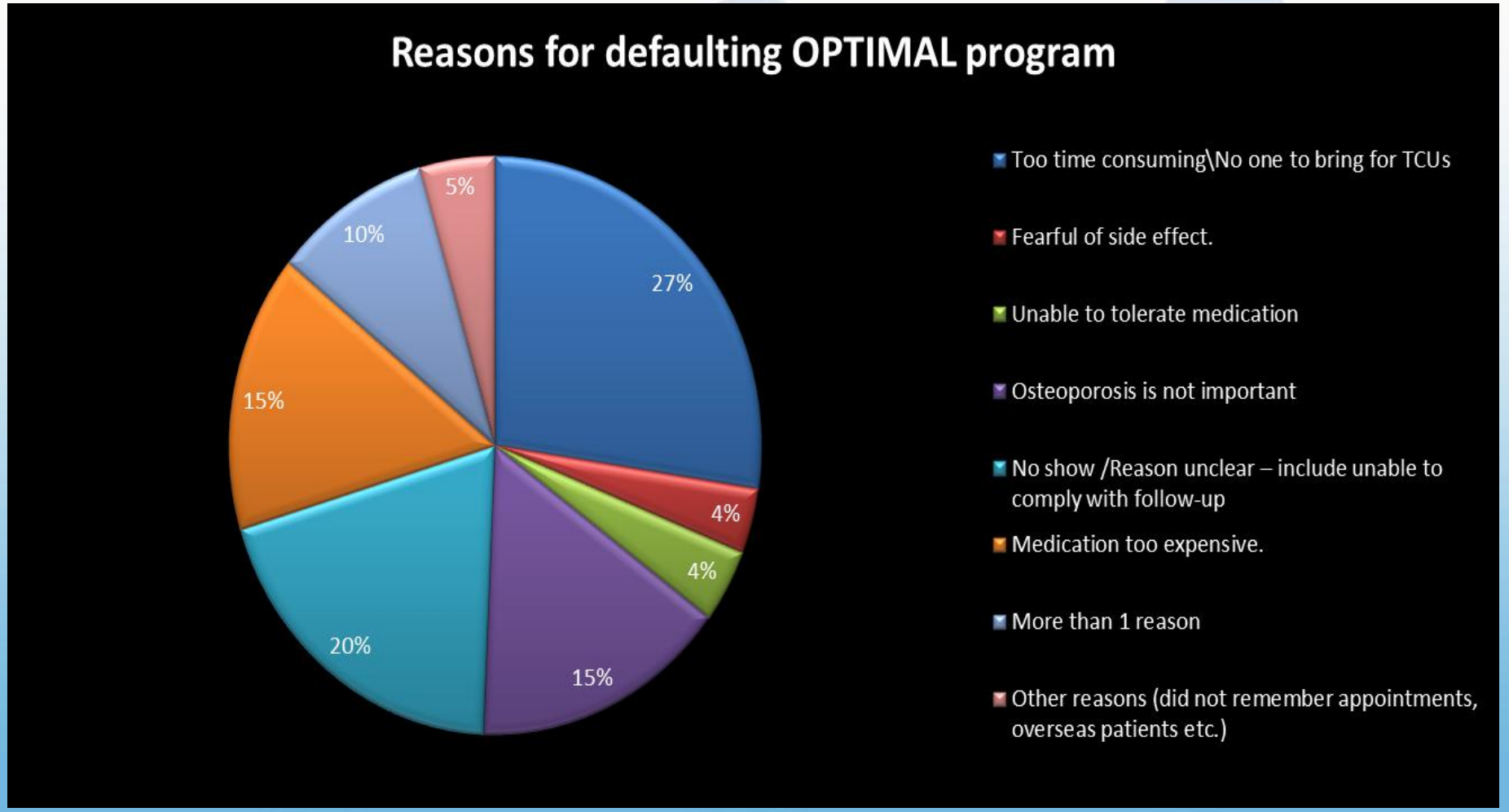
Manju Chandran

Where the Ball was Dropped- The System Level Challenges

J Clin Densitom 2015 Jul 21. doi: 10.1016/j.jocd.2015.06.009. [Epub ahead of print]
Dropping the Ball and Falling Off the Care Wagon. Factors Correlating With Nonadherence to Secondary Fracture Prevention Programs.
Chandran M, Cheen M, Ying H, Lau TC, Tan M.

- Failure to identify all fractures presenting to the hospital
- Inadequate capture of Vertebral fractures
- Failure to recruit all patients who were evaluated
- Decanting (“Right Siting” to polyclinics) slow
- Primary recruitment by Polyclinics lower than expected
- Manpower issues

Why do patients fall off of the Band Wagon of Secondary Fracture Prevention Programs?



SUMMARY

- **The OPTIMAL program has succeeded in identifying, evaluating and treating a large number of patients with fragility fractures at Singapore General Hospital**
- **All components of highly facilitated program appear to have contributed towards potentially decreasing care gap in management of fragility fractures**
- **High compliance rates with medication seen.**
- **However, ultimate success of program will be measured by fractures prevented over long term follow-up and cost effectiveness**
- **Goal: To ensure that no patient with fragility fracture is missed and that the first fracture will be the last**

Acknowledgements

- Ministry of Health Singapore
- A/Prof Dr Lau Tang Ching (Project Director-OPTIMAL, SINGAPORE)
- The following departments at SGH:

  Orthopedic Surgery

  Emergency Medicine

  Endocrinology

  Rheumatology

  Geriatrics

  Family Medicine and Continuing Care

  Obstetrics and Gynecology

AND

THE OPTIMAL TEAM AT SGH

Proposed Improvements in OPTIMAL II

- Involving GPs for better right siting of care
  - Follow up
  - Recruitment
- Tai Chi at Community Centres
- Use of Medisave (Compulsory Health Insurance Savings Scheme)for OP investigations and treatment to improve acceptance of program
- Integrating the Orthogeriatrics hip fracture care management program running at some hospitals with OPTIMAL

Involving General Practitioners

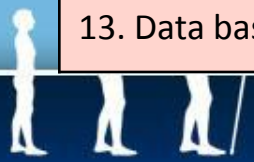
- Right siting of care
  - GP training courses to familiarize them with the OPTIMAL program
  - Care coordinator to liaise with GP/ Family Medicine Care for follow up
  - Investigations can be done at GP/ FMC (cost to be made comparable)

Integrating with Hip Fracture Care

- Advantages:
  - Integration of seamless care
    - Hip fracture care– care management up to community hospital.
    - OPTIMAL- step down to GPs
  - Better resource sharing and utilization
  - MOH may fund both programs together

Best Practice Framework- 13 internationally endorsed standards to guide FLS- Decide what to include in your service model

BPF Standard	Bronze	Silver	Gold
1. Patient Identification	Patients Identified not tracked	Patients identified; are tracked	Patients identified, tracked and independently reviewed
2. Patient evaluation	50% assessed	70% assessed	90% assessed
3. Post fracture assessment timing	Within13-16 weeks	Within 9-12 weeks	Within 8 weeks
4. VF identified	Known VF assessed	Routinely assess for VF	Radiologists identify VF
5. Assessment guidelines	Local	Regional	National
6. Secondary causes of OP	50% of patients screened	70% of patients screened	90% of patients screened
7. Falls prevention services	50% of patients evaluated	70% of patients evaluated	90% of patients evaluated
8. Multifaceted risk assessment	50% of patients screened	70% of patients screened	90% of patients screened
9. Medication initiation	50% of patients initiated	70% of patients initiated	90% of patients initiated
10. Medication review	50% assessed	70% assessed	90% assessed
11. Communication strategy	Comms to Drs	Comms to Drs with 50% criteria	Comms to Drs with 90% criteria
12. Long term management	1 year follow-up		6 month follow-up and 1 year follow-up
13. Data base	Local	Regional	National



Javaid MK et al. Osteoporos Int (2015) 26:2573-2578

AND THOUGH WE MAY NEVER BE ABLE TO ACHIEVE THIS

HOPEFULLY THIS CAN BE A THING OF THE PAST----

谢谢您

xiè xiè nín

Terima Kasih