

**Dr Mala Satkunanantham**

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## Mission Statement

To increase the rate of Osteoporosis Workup\* ordered, in distal radius fracture patients aged >50 years old, at the first visit, in Clinic B1A# TTSH, from median 3.5% to 80% (stretch goal = 100%), over 6 months.

\* Osteoporosis Workup includes (ie. Labs + BMD), at first visit.

# 4 out of 8 consultant clinics

### Cohort of Patients

Inclusion: Patients >50 years old, ambulant, including patients who decline.

Exclusion: Patients with BMD done within 2 years, on follow up elsewhere, low life expectancy.

## Team Members

	Name	Designation	Department
<b>Team Leader</b>	Dr Mala Satkunanantham	Consultant	HRM
<b>Team Members</b>	NO Fadzleen Johari	Nursing Officer	Orthopaedic Surgery / FLS
	Dr Bernice Heng	Service Senior Resident	HRM
	Mr Alfee Ahmad	Patient Service Associate	Clinic B1A
	NO Chan Sze Huey	Nursing Officer	HRM
	Dr Stephen Siew	Associate Consultant	HRM
	Ms Wang Hui Shan	Senior Radiographer	Diagnostic Radiology
<b>Sponsor</b>	Adj Asst Prof Sreedharan Sechachalam (Head of HRM)		
<b>Mentors</b>	Dr William Chan & Adj Asst Prof Justina Tan Wei Lynn		

## Evidence for a Problem Worth Solving

**Singapore Clinical Practice Guidelines: Osteoporosis 2008**  
Clinical quality improvement parameters - Proportion of patients with prior fragility fracture in adulthood receiving:

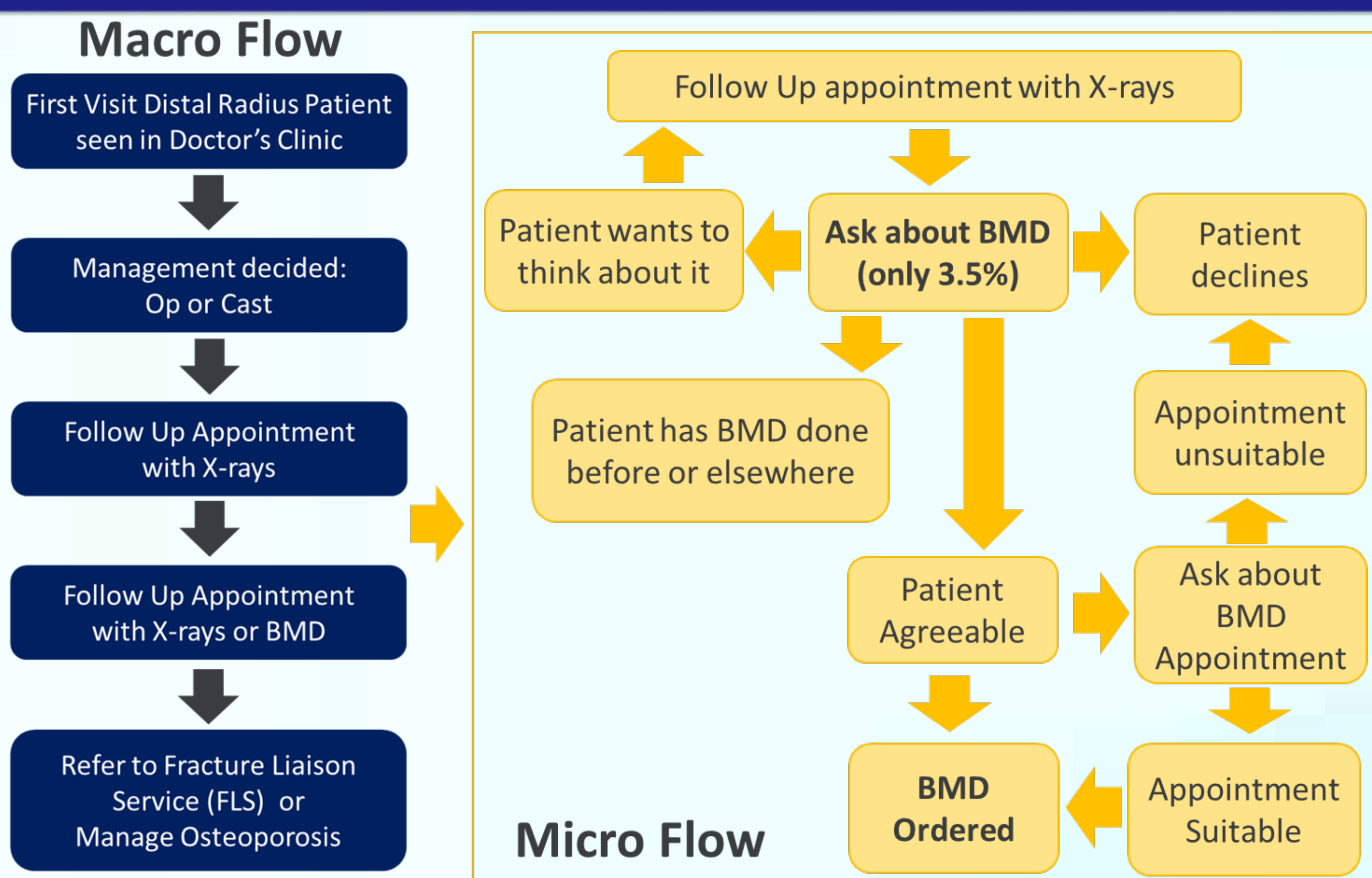
- appropriate evaluation for osteoporosis
- bone mineral density measurement
- appropriate treatment for osteoporosis

**NICE 2017 Quality Statement**  
Adults who have had a fragility fracture or use systemic glucocorticoids or have a **history of falls have an assessment of their fracture risk.**

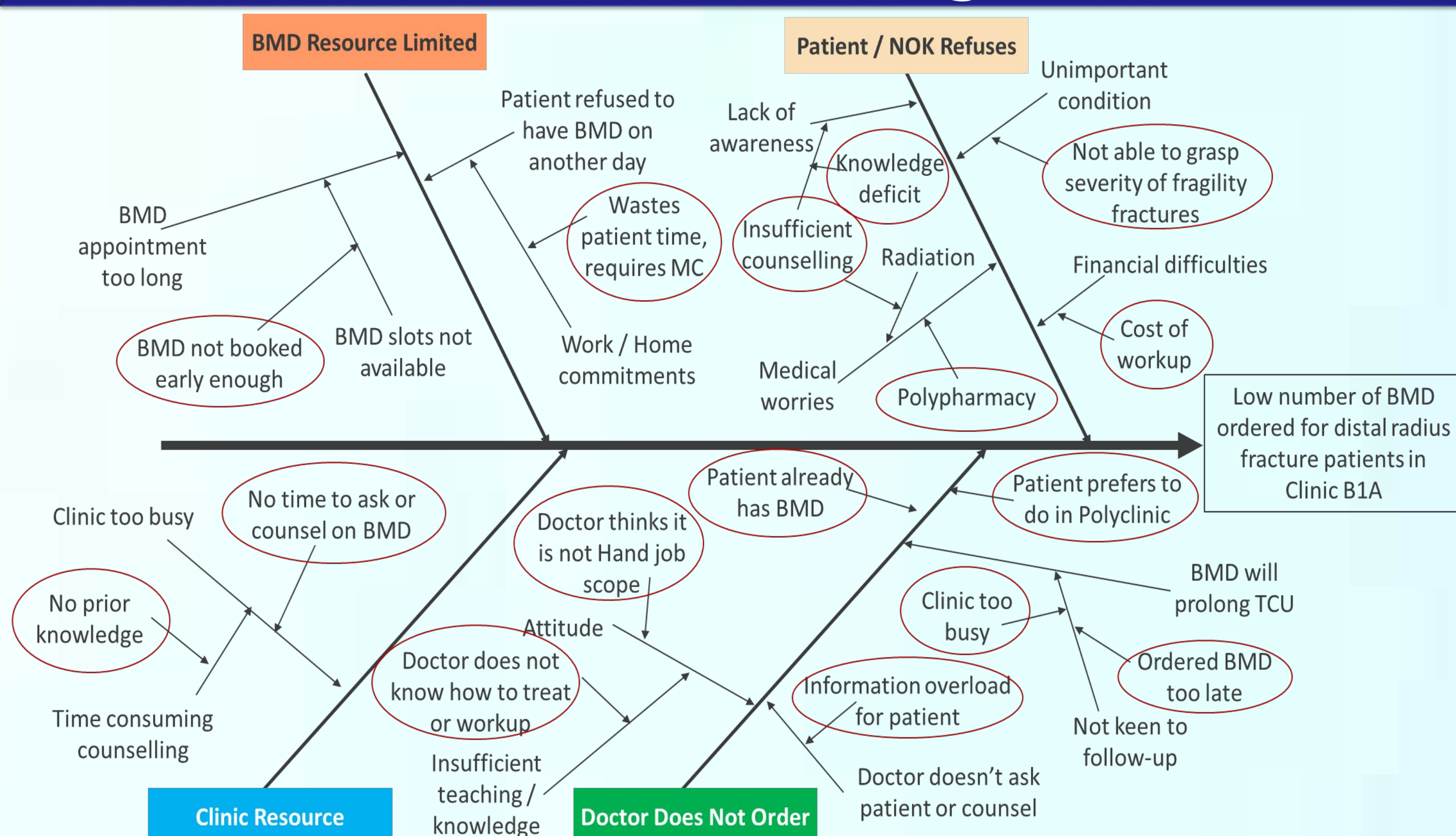
- An assessment of fracture risk should include **estimating absolute fracture risk**
- Either **FRAX** or **QFracture** should be used within their allowed age ranges

Baseline Data for BMD Ordered for Distal Radius Fracture Patients at Clinic B1A from 1 July to 31 August 2021 showed a median of 3.5%

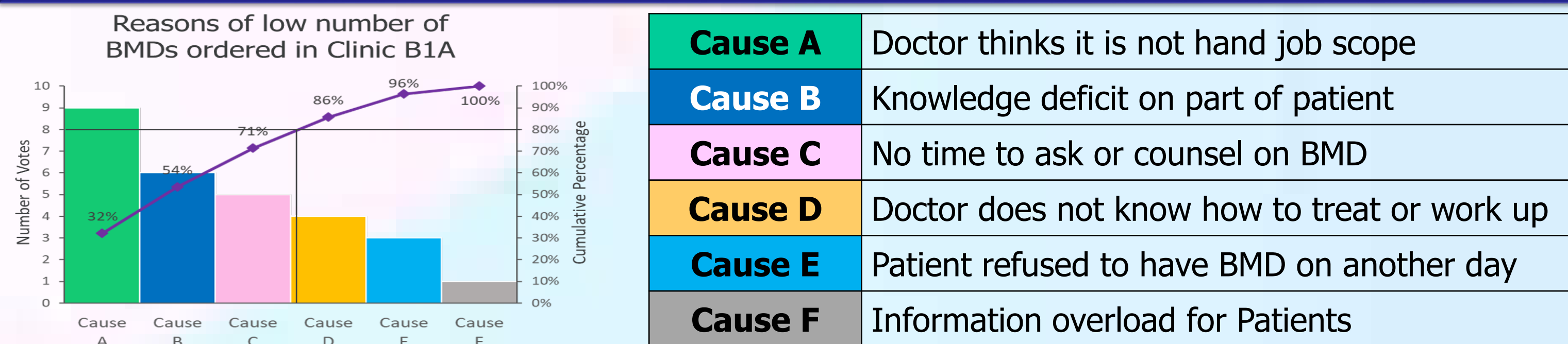
## Flow Chart of Process



## Cause and Effect Diagram



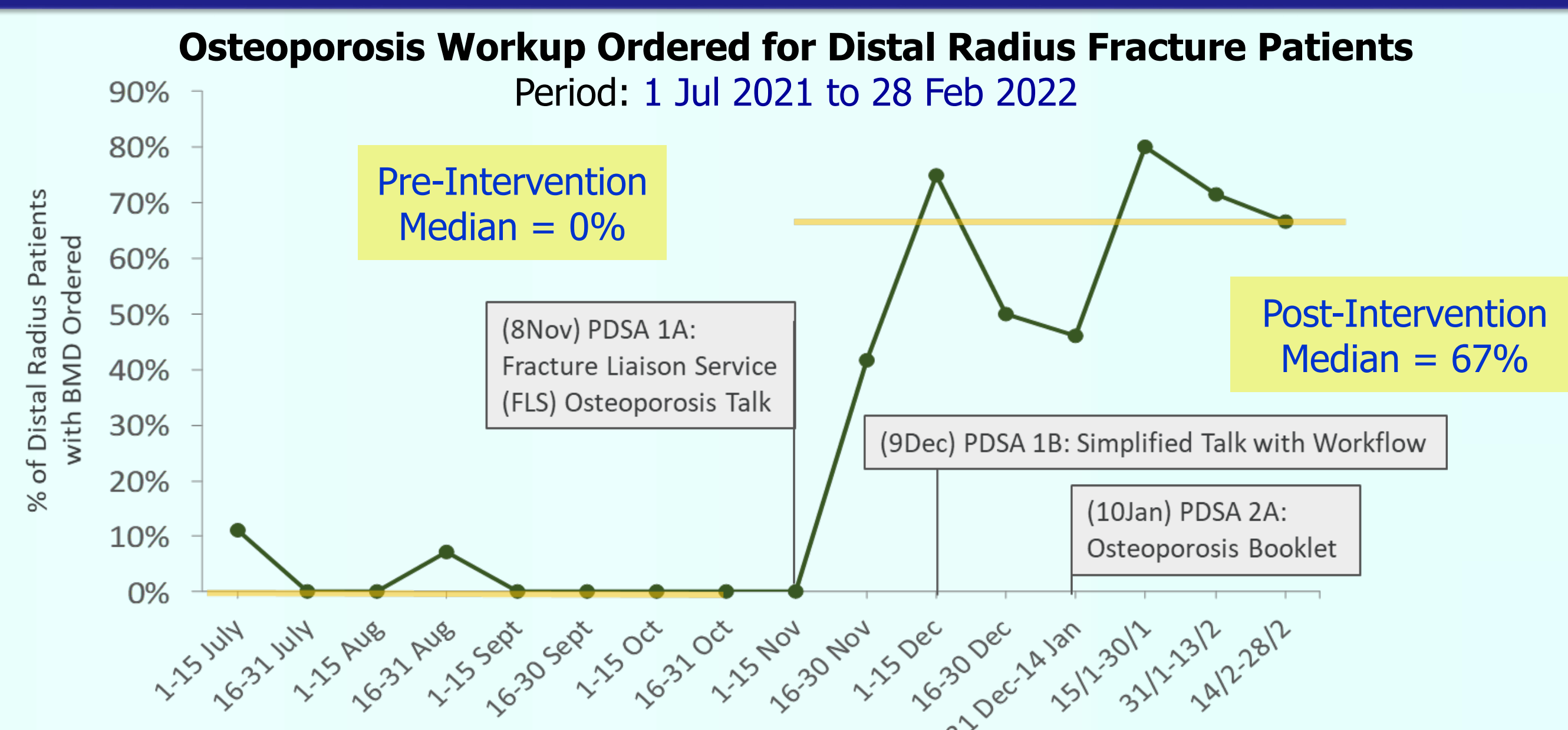
## Pareto Chart



## Implementation

Root Cause	Intervention	Implementation Date
<b>Cause A:</b> Doctor thinks it is not hand job scope	1. Osteoporosis talk by Fracture Liaison Service (FLS) 2. Osteoporosis talk by Project Leader (Simplified Talk with Workflow)	8 Nov 2021 9 Dec 2021
<b>Cause B:</b> Knowledge deficit on part of patient	Osteoporosis Booklet	10 Jan 2022
<b>Cause C:</b> No time to ask or counsel on BMD	Bundle orders, improve automation for test orders in Aurora.	On Hold for NGEMR
<b>Cause D:</b> Doctor does not know how to treat or work up	1. Info card regarding labs, scans & medication. 2. New Joiners Info Talk 3. Incorporate into Distal Radius First Visit protocol	Plan In-Progress

## Results



	1/7-15/7	16/7-31/7	1/8-15/8	16/8-31/8	1/9-15/9	16/9-30/9	1/10-15/10	16/10-31/10	1/11-15/11	16/11-30/11	1/12-15/12	16/12-31/12	1/13-14/1	15/1-30/1	31/1-13/2	14/2-28/2
No. of Distal Radius Fracture Patients	9	6	2	14	10	8	11	3	6	12	8	6	13	10	7	3
No. of BMD Ordered	1	0	0	1	0	0	0	0	0	5	6	3	6	8	5	2

Data Source: 1st visit shortcut on CPSS, e-PORT approved.

## Cost Savings

^Osteoporosis workup cost (5 years) per patient	\$1,309 (\$530)	<b>Notes:</b> Cost in SGD (Subsidised Cost) ^ Workup over 5 years: BMD, Labs, Dental clearance # Treatment: Alendronate; Denosumab 1:10 * Jan-Oct 2021 data * Projected no. of Distal Radius patients seen per year that go on to have hip fractures based on Shin 2020, Oyen 2020, Shah 2020.
#Osteoporosis treatment cost (5 years) per patient	\$513	
*Hip Fracture Inpatient treatment cost per patient	\$20,154 (\$6,720)	
Cost Avoidance if Osteoporosis is treated per patient	\$18,332 (\$5,677)	
*Cost Avoidance per year (2.5%)	\$174,154 (\$53,928)	
*Cost Avoidance per year (17%)	\$1.18m (\$366,713)	

## Problems Encountered

- Unable to implement automation in Aurora - Group tests for easier ordering
  - On hold for NGEMR
  - Labs required put on clinic notice board
- Doctors sometimes 'forgot' to ask
  - Reminders on clinic notice board and during orientation for new joiners
- No time to address in clinic - patient very worried about fracture
  - Address at next visit as well, can give booklet for next of kin to read.
- Patients refused
  - Educate about osteoporosis, TCU FLS if patient open to think about it.

## Strategies to Sustain

- Readily available information in the clinics (pamphlets)
  - Reminder notice in clinic rooms
  - Include simplified flowchart for new doctor orientation (presentation CME and document)
- Longer-Term Sustainability (Systemic Incorporation)**
- Incorporate osteoporosis into assessments eg. In-Training Assessment MCQs and qualifying (exit) exam
  - Develop distal radius/osteoporosis clinic with grant
    - Hire manpower to screen and activate referral to FLS and BMD bundle workup
    - Follow-up on results and have greater holistic management on all aspects of osteoporosis prevention and treatment