

Enhancing Screening of Osteoporosis Among the Postmenopausal Women at the General Medical Ward: A Quality Improvement Initiative at an Acute Hospital Setting in Singapore.

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Mission Statement

To improve the percentage of bone mineral densitometry (BMD) performed among postmenopausal women who are moderate to high risk osteoporosis category based on OSTA who are admitted to the inpatient general medicine ward (Medical C Class) from 9.1% to 60% within the duration of 6 months.

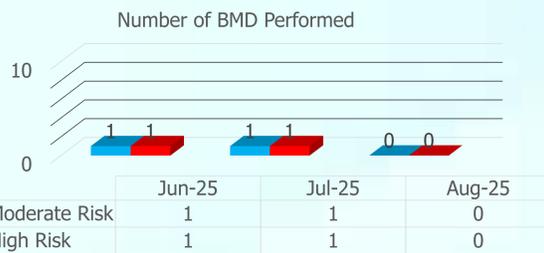
Team Members

Name	Department	Job Description	Project Role
Dr Tan Mei Ling	General Medicine	Consultant	Team Leader
Dr Tan Jun Guan	Laboratory Medicine	Consultant	Member
Dr Zin Min Aung	General Medicine	Staff Physician	Member
Dr Aw Hui Wen	General Medicine	Senior Resident	Member
Dr Jegannathan Anusha	General Medicine	Resident Physician	Member
Chen Siyun	Nursing Department	Advanced Practice Nurse	Member
Helen Chong	Diagnostic Radiology	Manager	Member

Acknowledgement
 Dr Lim Chiow Teen
Facilitator / Mentor
 Ms. Chan Sue Mei
 Ms. Doreen Lau Soo En

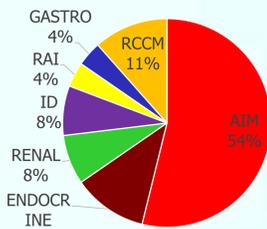
Evidence for a Problem Worth Solving

Current Practice: Low rate of BMD performed among Moderate (3.8%) and High Risk (12.5%) osteoporosis with risk factor(s) patients for 3 consecutive months.

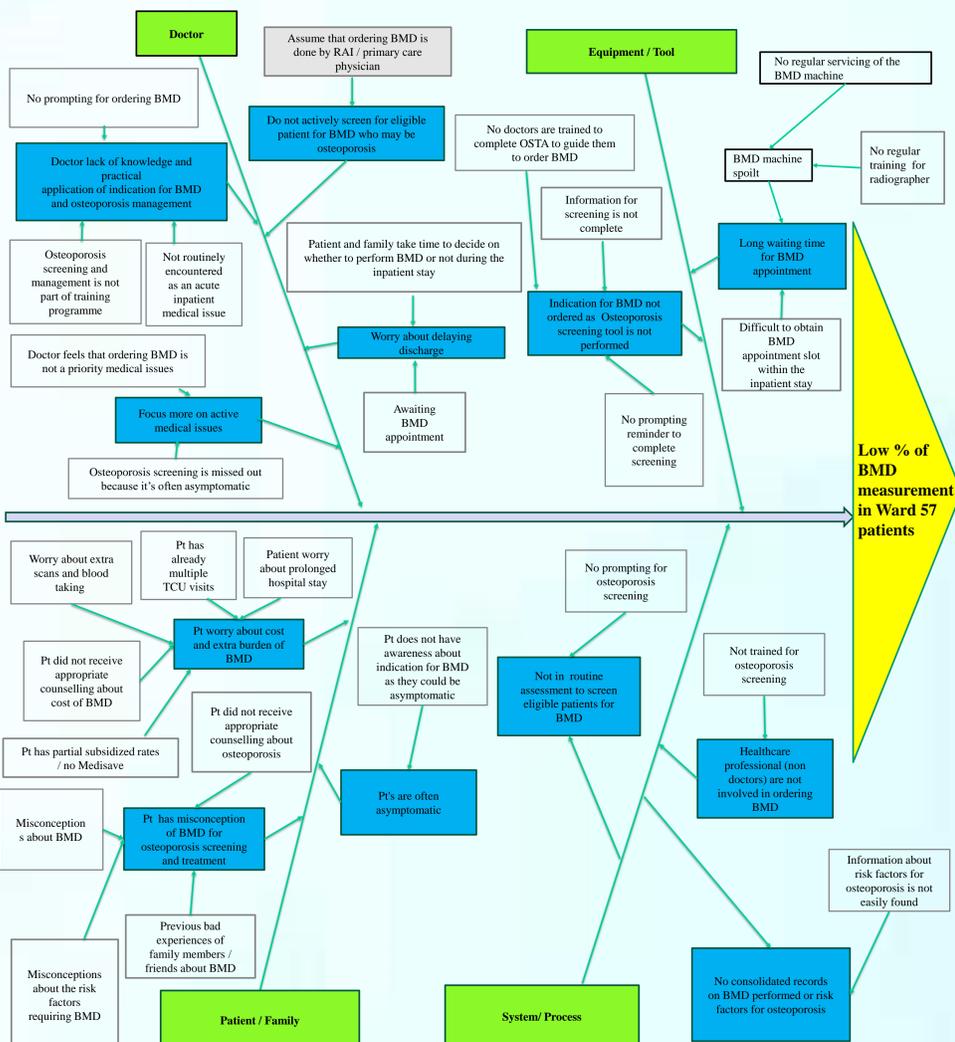


Current Performance of a Process

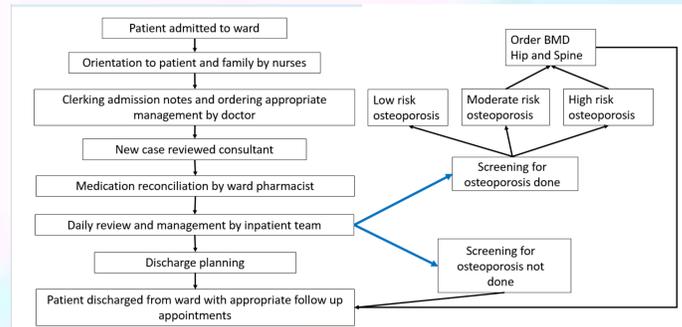
- Osteoporosis screening are not widely practiced in the GM inpatient.
- 91.5% believe that most patients are elderly and at risk of osteoporosis in Singapore
- 68.5%, do not think osteoporosis screening is necessary in the acute setting.



Cause and Effect Diagram



Flow Chart of Process



Osteoporosis screening process was studied in detail

Pareto Chart



- Doctor feel osteoporosis not priority medical issue
- No prompting for osteoporosis screening
- Doctors are not trained to complete osteoporosis screening
- Screening is missed because patient asymptomatic
- Patient worry about prolonged hospital stay
- Doctor assume osteoporosis screening is done by primary care physician

Implementation

PDSA 1.0 Awareness Meeting

- Educated about osteoporosis screening in hospitalized patients
- Evidence of osteoporosis in the Asian and local population
- How to identify (via screening) patient with risk of osteoporosis using OSTA

Menopause status: OSTA Score -

Table 3A Osteoporosis Self-Assessment Tool for Asians (OSTA)

Age (yr)	Weight (kg)	20-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79
45-49	45-49								
50-54	45-49								
55-59	45-49								
60-64	45-49								
65-69	45-49								
70-74	45-49								
75-79	45-49								
80-84	45-49								
85-89	45-49								

PDSA 1.1 Smart Phrase

- Resident Physician Created a Smart Phrase in the Epic
- Informed new batch of Jr Dr to use smart phrase to screen
- Nurses to continue to remind the doctors
- Informed the Consultant as well as registrar in charge

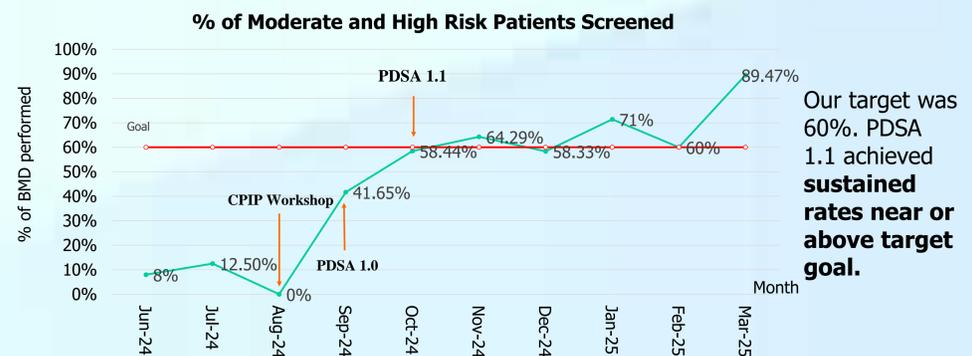
Action based on Osteoporosis Risk from the OSTA
 High Risk - order BMD hip & Spine
 Moderate Risk - Assess secondary risk factor (s) > 1 and measure BMD if present
 Low Risk - Defer BMD

Secondary risk factors
 - premature ovarian insufficiency (POI) before 40 years of age or early menopause (40-44 years of age) due to genetic
 - autoimmune condition
 - surgical or cancer treatment sequelae
 - Chinese ethnicity
 - family history of osteoporosis or fractures
 - prolonged steroid use (> 5 mg/day of prednisone or its equivalent for > 3 months in the past year)
 - Secondary causes of osteoporosis, such as diabetes mellitus, rheumatoid arthritis or parathyroid disease.
 - prolonged immobility
 - smoking, history of falls
 - excessive alcohol intake (> 2 units/day)
 - low calcium intake (< 500 mg/day)

Calcium level -
 Vitamin D level -
 Dental Screening
 TCU Dr Tan Mei Ling 3 months RP, BMP and Vitamin D on arrival

Example of Smart Phrase in Epic

Results



Cost Savings

KTPH Hip Fracture Unit (2024)

Average length of stay	13 days
Average cost for hospitalization	\$30,000
Average length in institutional CH	3 weeks

	BMD Outpatient	BMD Inpatient
Waiting time (days)	7-14	0-7
Cost (SGD) Subsidized	\$ 79.50-111.30	\$ 47.70
Cost (SGD) Private	159.00	159.00
Default rate (%)	30 - 40	0

While we are unable to quantify exact savings, it is expected that BMD screening and may be able to reduce hip fractures and hospitalization which on average cost \$30,000. Further inpatient entails benefits.

Benefits of Inpatient BMD Screening vs Outpatient

Strategies to Sustain

- Further Collaboration with ITD to create Epic Best Practice Advisory
- Regular training of new doctors on osteoporosis screening
- Collaboration with nursing team to screen
- Doctors Champions
- 2 monthly audit
- Positive Feedback/Reinforcement

Important (!)

OSTA Score for patient is more than 20. Please order BMD

Latest OSTA Score: 37.1

Reason for the BPA:

- 1 Patient is a female who is 55 years or older
- 2 OSTA score is more than 20
- 3 BMD is not ordered in NGE/MR for the patient in last 3 years.
- 4 Patient do not have Osteoporosis or Osteopenia in diagnosis history.

Order Do Not Order Mobile BMD (Bone Mineral Densitometry)

Acknowledge Reason

Will Order at next visit Other Reason