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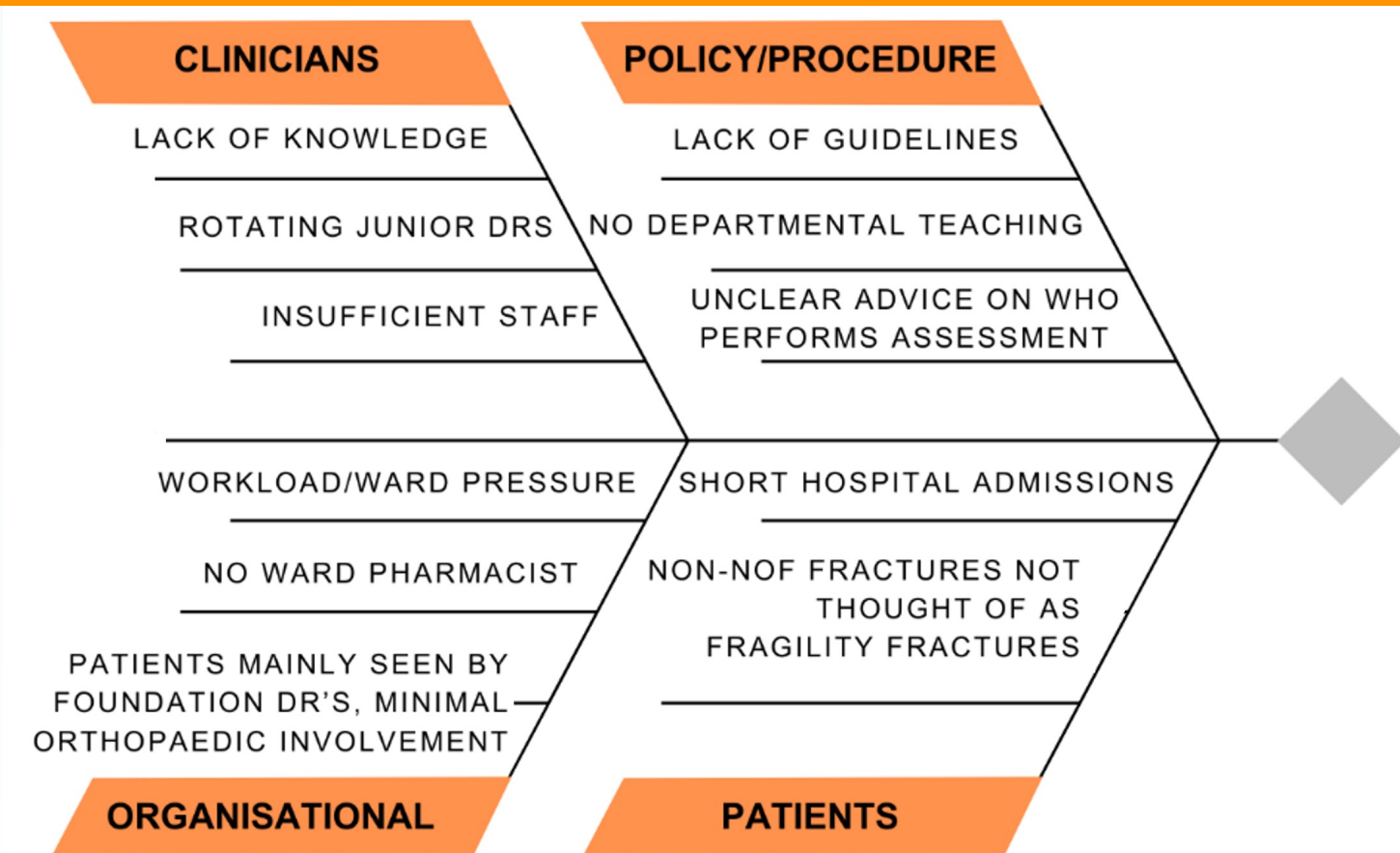
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Background

- Fragility fractures are common: 1 in 2 adult women and 1 in 5 adult men will sustain one or more fragility fractures in their lifetime. There are 549,000 new fragility fractures in the UK each year, 444,000 of which are non-Neck of Femur (NOF) fractures.¹
- Fragility fractures cost the NHS >£4.7 billion per year. NOF fractures account for £1.1 billion of this.¹
- Fractures cause severe pain, disability and poor quality of life.¹
- Preliminary data was collected in January 2023 prior to project inception. This demonstrated that clinician knowledge and confidence in performing bone health assessment,^{1,2,3} and the number of patients with non-neck of femur fractures who had bone health assessment performed was poor:
 - Only 31% of patients had any bone health bloods checked – only 13% had both calcium and vitamin D.
 - Only 7% of patients had a FRAX score calculated.
 - No patients had a DEXA scan requested.
 - Only 7% of patients had a comment regarding bone health communicated to their GP on the discharge summary.
 - Pre-teaching surveys demonstrated that Foundation Year 1 (FY1) doctor confidence and knowledge in bone health assessment was poor (64% perceived themselves as 'not confident at all' and 50% stated they had 'no knowledge').

Understanding the problem: A fishbone diagram



Aims

- To improve effective secondary prevention of fragility fractures for patients over the age of 50 with non-neck of femur fractures at Warrington Hospital.
- This project will use Plan-Do-Study-Act (PDSA) cycles with the aim to increase the percentage of inpatients that have a bone health assessment performed or a request communicated to their GPs by 40% by June 2024.

Methodology

- Stakeholder analysis was completed to ensure those influential were engaged in the project. Problems were identified through observed practice and stakeholder discussion.
- Using our electronic database (Lorenzo), all patients with non-NOF fractures over the age of 50 were identified as per the National Osteoporosis Guideline Group (NOGG) guidance (n=72).¹
- Data was collected retrospectively from electronic patient records on Lorenzo, including bloods performed, FRAX scores calculated, DEXA scans requested, patients requiring bone protection and communication to GPs.
- Surveys were conducted pre and post teaching sessions
- Data was extracted after each PDSA cycle (see project timeline below) and then analysed by the project leaders.

PROJECT TIMELINE

	TIME	INTERVENTION
PDSA CYCLE 1	January-May 2023	Departmental & FY1 teaching
PDSA CYCLE 2	May-October 2023	RCGP Osteoporosis e-learning ⁴ Bone Health management flowchart
PDSA CYCLE 3	October-December 2023	Pharmacist teaching
PDSA CYCLE 4	February-April 2024	Order set for bone health bloods
PDSA CYCLE 5	April 2024-present	Board round 'Medically Optimised For Discharge' checklist

Results

- All patient parameters/outcomes improved over the 4 PDSA cycles. The following data was collected after PDSA Cycle 4:
 - An increase by 64% in the number of patients who had bone health bloods checked (from 13% to 77%).
 - An increase by 78% in the number of patients who had a FRAX score calculated (from 7% to 85%).
 - 100% increase in the number of patients who had a DEXA scan requested who required one.
 - An increase by 55% in the number of patients who had bone health assessment communicated to their GP on their discharge summary (from 7% to 62%).
 - Overall increase in FY1 confidence and knowledge with 93% perceiving themselves as 'fairly to completely confident' and 100% having 'some to full knowledge'.
- The overall improvement has not been linear (see below figure). Confounding factors such as junior doctor changeover and absence of a consistent ward pharmacist may have accounted for this.

Conclusion

- This study demonstrates a significant overall improvement in bone health assessment performed at Warrington Hospital since January 2023.

Limitations and lessons learned

LIMITATIONS

- Small patient group and often shorter admissions than patients with NOF fractures, reducing the window to act.
- Rotational nature of foundation doctors limits sustainability and acts as a barrier to maintaining change.

LESSONS LEARNED

- Increasing knowledge alone doesn't always associate with clinical improvement.
- A multidisciplinary approach is necessary to maintain change.

Sustainability and plans for the future

- Project was presented at the local orthopaedic audit meeting and Quality Academy Showcase 2024 to increase awareness.
- Next steps include:
 - Evaluating effectiveness of checklist implemented (below).
 - Create a personalised orthopaedic discharge summary to include a bone health section.
 - Continue to deliver teaching at each junior doctor changeover induction.
 - Recruit subsequent FY1 doctors to continue project.

Diagram demonstrating PDSA intervention 5

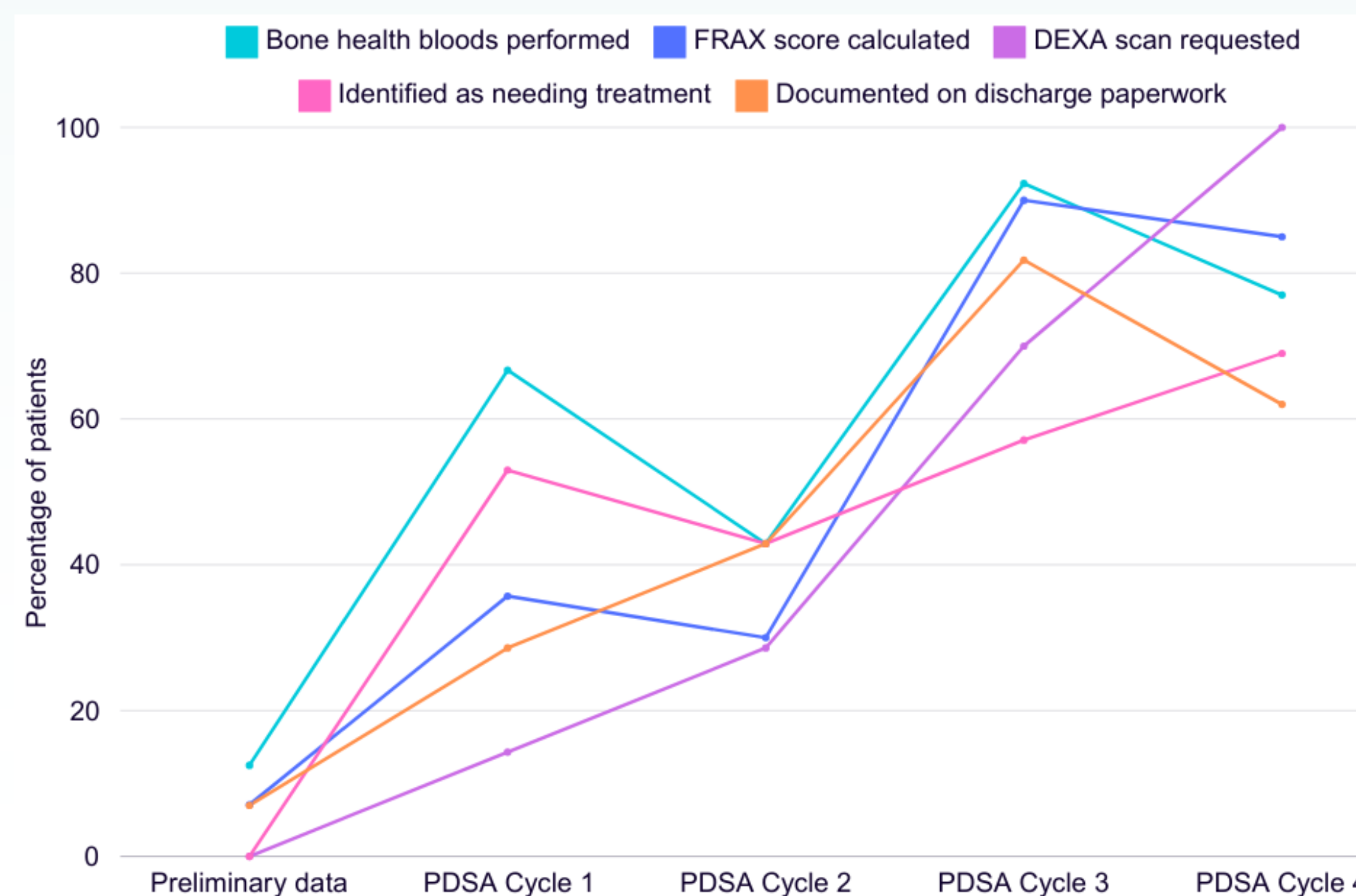
ORTHOPAEDIC BOARD ROUND MEDICALLY OPTIMISED FOR DISCHARGE CHECKLIST

*Checklist to be performed by charge nurse during board round once a doctor has determined that a patient is medically optimised for discharge.

CHECKLIST:

- Has the patient:
- Been TWOC'd*?
 - Got a plan for VTE prophylaxis or been placed back on their usual anticoagulation*? Has the community prescription been completed*?
 - Had surgical clips removed or got a date/plan for removal in community*?
 - Had post-operative check X-rays performed and reviewed*?
 - Got a plan for any follow up documented on their discharge summary?
 - Had bone health assessed and documented on their discharge summary, including any treatments started and investigations requested?
 - Been signed off by physiotherapy?
 - Been signed off by occupational therapy?
 - Got anything else patient specific outstanding prior to discharge? For example, palliative care referral, learning disability or mental health needs to consider*

Figure demonstrating overall trend in outcomes



References

1. National Osteoporosis Guideline Group, *The Clinical Guideline: NOGG 2021*. <https://www.nogg.org.uk/> (accessed 10 January 2023)
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3. NICE, Osteoporosis – prevention of fragility fractures. April 2023. <https://cks.nice.org.uk/topics/osteoporosis-prevention-of-fragility-fractures/> (accessed 10 January 2023)
4. Royal Osteoporosis Society, *RCGP osteoporosis e learning*. <https://theros.org.uk/healthcare-professionals/courses-and-cpd/rcgp-osteoporosis-elearning/> (accessed 10 January 2023).