Royal College of Physicians | National Hip Fracture Database (NHFD)

Improvement case study

Improving NHFD KPI 7 – Medication

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Background

On taking over the orthogeriatric team in 2022 I noted that we were performing poorly (19.5%) against the national average in bone medication prescription on the National Hip Fracture Database (NHFD)'s KPI7: very few patients were receiving IV bisphosphonates prior to discharge from hospital.

In my trust (Sherwood Forest Hospitals NHS Foundation Trust), the guidelines for vitamin D loading advised a 7-week course of weekly vitamin D. For patients presenting with a fracture, if they had low vitamin D levels, they were not able to receive IV zoledronate as inpatients, as the loading regimen took too long and they had been discharged before it was complete. This was a missed opportunity to initiate first-line therapy in fractured neck of femur (#NOF) patients over 75, and in those with non-hip fractures for whom IV zoledronate was appropriate.

Aim

Introduction of a rapid vitamin D loading regime and the impact on bisphosphonate prescription in patients with a fractured neck of femur to improve performance in KPI7.

Process

I wanted to understand the barriers preventing patients from receiving bone protection medication following a hip fracture, and to increase the number of patients who receive appropriate treatment.

My aim was to enable the vast majority of patients presenting with #NOF to receive their first dose of IV zoledronate during their inpatient stay. I also wanted to ensure that patients with non-hip fractures, who were suitable for IV zoledronate as first-line therapy – either due to high fracture risk or an inability to take oral bisphosphonates – could receive treatment before discharge.

This was particularly important for patients who were unlikely to attend follow-up appointments reliably. I was keen not to focus solely on hip fracture patients, as doing so would risk worsening inequities in care.

I consulted with orthogeriatricians and endocrinologists in other local trusts to find out about their practice. I involved pharmacy colleagues, my head of service and my team, and the osteoporosis clinical lead. I presented 'barriers to bone protection' to my clinical chairs.

I also presented at grand rounds and my departmental meeting to raise awareness of issues around bone medication prescription.

I undertook the following process:

1. **Identifying the impact of the problem** – I took a baseline audit of vitamin D levels of those admitted with #NOF to find out how often this was <50 nmol/L, indicating replacement would be needed before IV zoledronate could be given. This confirmed the hypothesis that low vitamin D was a common barrier to inpatient administration of IV zoledronate. Low vitamin D was found in 54% of audited patients. Of those patients who were otherwise suitable for inpatient IV zoledronate (had vitamin D barrier been eliminated), only 13% were commenced on treatment as an inpatient.
2. **Liaison with local trusts** – I communicated with three local trusts to find out their vitamin D loading guidelines and practice. All three were using rapid loading regimes for patients planned for inpatient IV zoledronate.
3. **Draft guideline production** – I drafted a trust guideline to recommend a 5-day loading regime rather than the 7-week regime we had in place. I presented this at local departmental meetings and liaised with pharmacy teams. My local osteoporosis lead also presented it at their departmental governance meeting.
4. After talking through governance and getting consensus, we piloted the guideline within the orthopaedic wards for an 8-week period.
5. Re-audit followed which demonstrated despite similar rate of low vitamin D levels on admission (56%), following implementation of rapid loading guideline, 82% of suitable patients were commenced on treatment before discharge.

Outcomes

Implementation of the new rapid loading guideline for vitamin D enabled delivery of bone protection medication before discharge, improving our NHFD KPI 7 from 19.5% in March 2022 to over 70% by the end of 2024 (the national average went from 32% to 53% over same period).

After piloting the guideline, we repeated the audit. Despite similar rates of low vitamin D levels on admission (56%), after implementation of the rapid vitamin D loading guideline, this time 82% of suitable patients received their first dose of treatment before discharge (compared to 13% at baseline).

Any change that leads to a significant increase in the prescription of a medication with which many prescribers are unfamiliar can lead to problems. My advice would be to introduce extra training for those most likely to prescribe IV bisphosphonates, and to consider extra safeguards to minimise prescribing errors. We now have an IV zoledronate prescribing checklist, and a zoledronate 'tag' on our electronic prescribing platform (Nervecentre).

Lessons learnt

- If Vitamin D loading is a common barrier to inpatient administration of IV zoledronate, liaise with other local trusts to see what they are doing, and consider implementing a rapid loading guideline.
- Involve pharmacy from the outset in any improvement that is likely to alter prescribing.
- Do a case review of 50 #NOF patients who did not receive IV zoledronate before discharge to explore what the barriers were.

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