

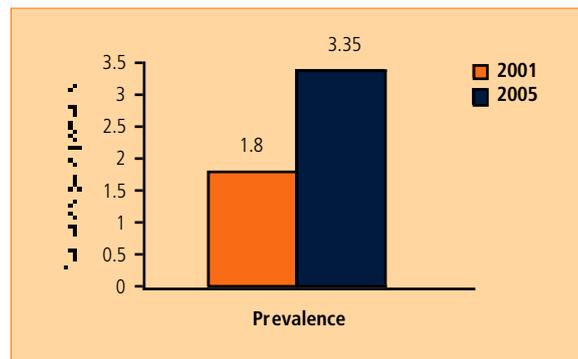
# IT and osteoporosis – the GP's perspective

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**It could be said that primary care IT has tended to lead where others have notably failed to follow. The diverse information systems in use by GPs and their staff have been criticised on the grounds of functionality, user interface and interoperability. The experience of primary care should, however, be a learning platform from which to build as we face a massive increase in the use of IT within the NHS. There is a concern that Connecting for Health (formerly the National Programme for Information Technology) has an agenda that has failed to grasp that the bulk of patient-clinician contacts occur in primary care, which is where the greatest real world experience of the day-to-day use of IT within the clinical encounter is to be found.**

The delivery of the Quality Outcomes Framework (QOF) has, among other things, systematised and brought incentives to the documentation of delivered interventions that are included within the clinical domains of the new GP contract. Accurate and consistent use of a computer by the clinician is essential to the monitoring of this framework, and general practice has exceeded the standards expected at the end of the first year of implementation. The QOF is dependent on IT and this is bringing astonishing improvements in the standards of documented delivered care that will, hopefully, result in better health outcomes for patients.

Those improvements seen in prevalence and proxies of outcome in the cardiovascular domain illustrate what can be achieved with the application of IT to clinical care.



**Figure 1.** Identified prevalence of coronary heart disease in Gloucestershire

Countywide audit results in Gloucestershire have demonstrated improved standards since the introduction of the new GP contract (Figure 1). Poor data quality before the QOF has been recognised elsewhere. In a cross-sectional study of 46 practices, it was found that 15% of patients coded for ischaemic heart disease were healthy and 19% of patients on relevant drugs had no disease code.<sup>1</sup>

Nevertheless, the improvements in data quality seen in the QOF have not occurred in osteoporotic fracture prevention because it is not currently an established domain. This is surprising, given the more than two million bed days involved in the care of fragility fracture in England,<sup>2</sup> which currently exceeds all the other domains except stroke care. It is even more surprising in the light of the estimated £1.8 billion costs for the health and social care consequences of fragility fractures.<sup>3</sup> General practice is probably best placed to manage those at risk because the numbers are manageable within primary care, when the national prevalence of at-risk patients<sup>6</sup> is reduced to that of an English GP's average list size of 1,745 patients (see Figure 2, overleaf).<sup>7</sup>

Except for small pockets of excellence aligned to the fracture discharge liaison model,<sup>8</sup> incident fractures are not being commonly managed systematically in

secondary care<sup>9-11</sup> or in primary care.<sup>12</sup> Only general practice can deliver the case-finding strategies to identify prevalent high risk patients.<sup>6,13</sup> General practice is perhaps best placed to use its IT to ensure concordance – an important and problematical area of clinical effectiveness.<sup>14</sup>

### Barriers to making the best use of IT

One of the main problems is the persistence of unstructured paper-based cross-boundary information flows. This makes capture of clinical events haphazard. A Department of Health (DH) target for the transmission of encrypted and coded diagnostic imaging results, which would have been useful for building a fracture register, was not achieved. Lack of standards for the transmission of electronic records between practices means that when a patient moves, their electronic clinical record is lost.

It has been recognised that data quality in primary care regarding osteoporosis is poor. De Lusignan and colleagues<sup>15</sup> in a study of 78 practices, identified the following difficulties:

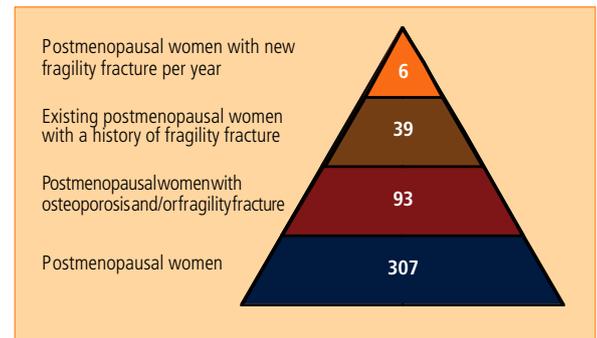
- Fracture data recording varied 100-fold
- Fractures were not identified as fragility or non-fragility
- T-scores were unrecordable on GP systems
- Treatment was recorded more often than diagnosis
- Multiple ways of expressing the same concept existed within the coding system.

### Driving up quality

The obvious aim of medical informatics is to improve the standards of care and health outcomes experienced by patients. This can be divided into two strands: the acquisition of clinical information, and the process of monitoring the continued delivery of care by electronic rather than paper-based means.

The concept of an electronic template is familiar in primary care. It is basically a collection of clinical terms configured in a way that should aid the clinician's ability to document the history, examination, investigation and management of the patient. The advantages of this approach are:

- There is encouragement to complete a consistent assessment by a variety of different clinicians time and time again



**Figure 2. The pyramid of females 'at risk' of osteoporotic fracture: the approximate number of postmenopausal women on an average GP's list**

- The codes entered are drawn from a 'pick list' normally derived from national or local consensus and thus reducing the chance of an inappropriate code being used
- Review dates can be entered so that failure to re-attend can be trapped
- Captured information is searchable and retrievable in a way that allows performance management and clinical audit to be readily achieved and issues about patient concordance identified.

The different manufacturers' systems that are in use have created difficulties with running the same searches on different platforms, and sometimes even the same platforms in different surgeries.

It is here that a Structured Query Language (SQL) approach, such as that used in Morbidity QUery Information Export SynTax (MIQUEST) has paid dividends. At the time of writing, the Radiography and Health Informatics department at the University of Derby is co-operating with the county primary and community care audit group for the three primary care trusts (PCTs) in Gloucestershire to develop such a tool that reflects the recent National Institute for Health and Clinical Excellence (NICE) technology assessment related to osteoporosis and guidance on falls, as referenced below.

It is anticipated that this will identify significant gaps in both data recording and care delivery. The reusability of electronic audit tools means the process can be cyclically repeated without difficulty. Comparative performance between practices can be viewed anonymously.

## Read codes

Central to the management of information within healthcare is a form of coded representation. There have been many different systems but in primary care it is the Read system. This is a hierarchical classification of clinical terms and concepts that includes medical history, examination findings, investigations, procedures and more beside.

First devised by Dr James Read in the Eighties, it has evolved through three versions (although the 5-byte set, known as Version 2, is to all intents and purposes the only edition in widespread use). It has picked up new terms as it has grown and is now the standard clinical classification employed in general practice. All GPs will have an interface on their clinical systems that allows them to produce a 'pick list' of relevant terms within the classification, each 'loaded' with its code, from which he or she can choose. However constraining, this is obviously more robust and more easily searchable than free text entry, where a concept could be misspelled or represented by a number of synonyms.

One of its strengths, which has worked quite well over recent years, is the ability of users to suggest new terms. An online review process and a team of coding specialists ensures that, as well as reflecting the needs of clinicians, conformance to standards is maintained. The National Osteoporosis Society (NOS), through its GP scientific advisory group members, has largely been responsible for the introduction of the bulk of the codes relevant to falls and osteoporosis in primary care. A summary of these is available in the healthcare professionals' page on the NOS website ([www.nos.org.uk](http://www.nos.org.uk)). A dataset principally consisting of clinical exemption codes has recently gained acceptance to further support electronic audit and a potential domain in the new General Medical Services (GMS) contract.

Both a strength and a weakness of a hierarchical classification is the ability to use 'parent' codes that a software writer can define and search on, confident that all the daughter codes will be trapped. In the case of osteoporotic fractures, for instance, this appears at first sight an ideal solution. For a hip fracture, it is only necessary to choose a top level code, such as S30, and all the different

varieties of hip fracture are also included. Unfortunately, in the subsets included are a variety of hip fracture types that are unlikely to be due to fragility, such as 'open fractures'. In such instances, there are three options open to the IT-dependent clinician:

1. It is accepted that the patient set thus identified is impure. Appropriate strategies are adopted at an individual patient level and exemption from intervention or audit is flagged on the patient's electronic record
2. An additional code is added to identify those fractures that are likely to be due to minimal trauma
3. A complex query is set up that excludes those fractures likely to be due to high-impact injury.

All of this is less than satisfactory but it is the situation GPs have largely been forced to cope with in the present evolutionary state of medical informatics. The long-awaited appearance of a new sort of coding system should help practically. Systematised Nomenclature of Medicine – Clinical Terms (SNOMED-CT, [www.connectingforhealth.nhs.uk/technical/standards/snomed](http://www.connectingforhealth.nhs.uk/technical/standards/snomed)) is a transatlantic collaboration that is planned to replace the Read code set and be implemented throughout the NHS. Its advantages promise the emergence of a truly international, language-independent nomenclature for medical terminology. It will be a superset of Read and the hospital coding systems ICD nine and ten, so legacy data should not be lost or cause unmanageable difficulties. Perhaps most interesting for clinicians will be the entirely different structure of core terms and modifiers, which is much nearer to the natural linguistic and logic processes used in real life. A final benefit is the ability to 'retire' redundant codes that may no longer be approved but need to be retained for searches on old records.

## Making the best use of IT in existing healthcare organisations

Although there is a temptation to await the developments within the emerging national IT infrastructure, there are plenty of opportunities now to implement changes in processes that will support effective care, whatever the final 'shape' of future NHS IT.

## Box 1. Suggestions for using primary care information technology to improve data quality and care related to osteoporosis and falls

- Identify patients with a relevant diagnostic code but no treatment, or with treatment but no diagnostic code.
- Identify those on bisphosphonates or strontium ranelate with no co-prescription of calcium or vitamin D<sub>3</sub>. Unless you are sure they are calcium and vitamin D<sub>3</sub> replete, they should receive adjunct therapy.
- Identify under-65s on bisphosphonates. Absolute fracture risk is usually low in this age group; should the need for treatment be reviewed in the light of NICE Technology Appraisal 87?<sup>16</sup>
- Identify over-75s on etidronate. Is this still the best treatment for a patient who might be now moving into the age when hip fracture is the greatest risk?
- Build a register of patients with prevalent fragility fracture. Consider asking your local fracture clinic whether they have been scanned or treated according to NICE Technology Appraisal 87.<sup>16</sup>
- Build a register of residential and nursing care home patients. Have you considered them for calcium and vitamin D<sub>3</sub> preparations?
- Build a register of patients on long-term systemic glucocorticoids. Are they having a licensed bone protective agent if over 65 or have they been assessed if not?
- Build a register of fallers. Have they been assessed for disorders of gait or balance or considered for referral to a falls service?
- Audit the number of older patients on your falls register who have been assessed for osteoporosis and the number of older patients with an osteoporosis or fracture code who have been assessed for falls risk.

The likely information requirements are predictable from changes under way and might be expected include:

- NICE guidelines and technology assessment that have been published on secondary prevention of fractures<sup>16</sup> and falls<sup>17</sup>
- NICE publications that are expected on falls clinics, primary prevention, strontium ranelate and the guidelines on the management of osteoporosis
- The guidance document, *National Service Framework for Older People*.<sup>18</sup>

A series of suggestions are included in **Box 1**. These would allow improvement and audit of the standards of care in falls and osteoporosis in clinical practice. Some of the suggestions would also prepare the way for monitoring the delivery of the NICE technological assessment on secondary prevention, PCT inspections by the Healthcare Commission and any changes

in the QOF, should the submission prepared by the NOS prove successful.

### References

1. Gray J, Ekins M, Scammell A, Carroll K, Majeed A. Workload implications of identifying patients with ischaemic heart disease in primary care: population-based study. *J Public Health Med* 2003; **25**: 223-227.
2. Department of Health. *Hospital Episode Statistics - 2003/04 (England)*. London: DH, 2004.
3. Burge RT, Worley D, Johansen MA *et al*. The cost of osteoporotic fractures in the UK: projections for 2000-2020. *J Med Economics* 2001; **4**: 51-62.
4. Lawrence IM, White CT, Wenn R, Moran CG. The current hospital costs of treating hip fractures. *Injury* 2005; **36**: 88-91.
5. Kanis JA, Brazier JE, Stevenson M, Calvert NW, Lloyd-Jones M. Treatment of established osteoporosis: a systematic review and cost-utility analysis. *Health Technol Assess* 2002; **6**: 1-146.
6. Brankin E, Mitchell C, Munro R. Closing the osteoporosis management gap in primary care: a secondary prevention of fracture programme. *Curr Med Res Opin* 2005; **21**: 475-482.
7. Royal College of General Practitioners. *Profile of UK Practices, June 2004*. RCGP Information Sheet No. 2. London: RCGP, 2004.
8. McLellan AR, Gallacher SJ, Fraser M, McQuillan C. The fracture liaison service: success of a program for the evaluation and management of patients with osteoporotic fracture. *Osteoporos Int* 2003; **14**: 1028-1034.
9. Panneman MJ, Lips P, Sen SS, Herings RM. Undertreatment with anti-osteoporotic drugs after hospitalization for fracture. *Osteoporos Int* 2004; **15**: 120-124.
10. Jachna CM, Whittle J, Lukert B, Graves L, Bhargava T. Effect of hospitalist consultation on treatment of osteoporosis in hip fracture patients. *Osteoporos Int* 2003; **14**: 665-671.
11. Bahl S, Coates PS, Greenspan SL. The management of osteoporosis following hip fracture: have we improved our care? *Osteoporos Int* 2003; **14**: 884-888.
12. Elliot-Gibson V, Bogoch ER, Jamal S, Beaton DE. Practice patterns in the diagnosis and treatment of osteoporosis after a fragility fracture: a systematic review. *Osteoporos Int* 2004; **15**: 767-778.
13. Bayly J, Carter G. A primary care approach to managing patients at risk of osteoporotic fracture. *Osteoporosis Review* 2004; **12**: 7-11.
14. McCombs JS, Thiebaud P, McLaughlin-Miley C, Shi J. Compliance with drug therapies for the treatment and prevention of osteoporosis. *Maturitas* 2004; **48**: 271-287.
15. De Lusignan S, Valentin T, Chan T *et al*. Problems with primary care data quality: osteoporosis as an exemplar. *Inform Prim Care* 2004; **12**: 147-156.
16. National Institute for Health and Clinical Excellence. *Bisphosphonates (alendronate, etidronate, risedronate), selective oestrogen receptor modulators (raloxifene) and parathyroid hormone (teriparatide) for the secondary prevention of osteoporotic fragility fractures in postmenopausal women*. *Technology Appraisal 87*. London: NICE, 2005.
17. National Institute for Health and Clinical Excellence. *Falls: The assessment and prevention of falls in older people*. *Clinical Guideline 21*. London: NICE, 2004.
18. Department of Health. *National Service Framework for Older People*. London: DH, 2001.

## Key points

- The improvements in data quality seen in the Quality Outcomes Framework (QOF) have not occurred in the area of osteoporotic fracture prevention because it is not currently an established domain.
- There are plenty of opportunities now to implement changes in processes that will support effective care, whatever the final 'shape' of future NHS IT.