Achieving population health impact, by systematically addressing the quality and cost effectiveness of prescribing as part of the management of major killer chronic diseases in primary care
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Achieving population health impact, by systematically addressing the quality and cost effectiveness of prescribing part of the management of major killer chronic diseases in primary care


FOREWORD

The Health Inequalities National Support Team (HINST) has selected this topic as the subject of one of its ‘How to’ guides for the following reasons:

- It offers the potential to systematically improve the outcomes from evidence based treatment of patients with potentially killer conditions, on a scale that could enable the individual patient quality improvements to add up to a population level change.

- Specifically, within the ‘Christmas tree’ diagnostic, it addresses:
  - local service effectiveness (2)
  - cost effectiveness of care (3)
  - interventions of known clinical efficacy (1)
  - improving responsiveness of services (9).

- It can make an important contribution to meeting the Quality and Productivity Challenge, encouraging significant improvements in outcomes for patients through secondary and tertiary prevention, while reducing the average costs of:
  - the interventions themselves
  - the ‘salvage costs’ of patients previously at risk of significantly poorer outcomes.

- Successful adoption of processes similar to those outlined here would demonstrate fulfilment of World Class Commissioning competencies in the following areas:
  - collaborate with clinicians (4)
  - manage knowledge and assess needs (5)
  - stimulate the market (7)
  - promote improvement and innovation (8)
  - manage the local health system (10)
  - sound financial investment (11).
Achieving population health impact, by systematically addressing the quality and cost effectiveness of prescribing part of the management of major killer chronic diseases in primary care

**CONTEXT**

This particular guide is based on a case study example of good practice identified during the HINST visit to Rotherham Primary Care Trust (PCT) in March 2007. The technique has also been used successfully in a number of other areas (e.g. NHS South of Tyne and Wear). It relates medicine prescribing costs to clinical outcomes identified in the Quality and Outcomes Framework (QOF). NHS Rotherham kindly agreed to work with HINST in the production of this practical ‘How to’ guide.

**Experience of addressing the quality and cost effectiveness of prescribing in NHS Rotherham**

The prescribing team in Rotherham PCT was committed to contributing to the Health Inequalities Action Plan, which was developed by the PCT as a result of the recommendations made by HINST.

The primary aim of the plan was to reduce the gap between life expectancy in the PCT area and the national average, in pursuit of the 2010 PSA target. The plan also emphasised the importance of addressing the life expectancy gap between areas within a district. It was recognised that an important contribution to narrowing this gap could be made by improving management of a number of chronic but ultimately fatal conditions.

The approach taken involved plotting data on prescribing costs and resultant clinical outcomes for key risk conditions (diabetes, hypertension, raised cholesterol and chronic obstructive pulmonary disease (COPD)) for each GP practice. Results can then be clustered by level of performance. On the basis of comparisons of prescribing practice within and between clusters, changes can be recommended and supported to move outliers up towards the practice of the best, thereby reducing inequalities in outcome and prognosis.

**Constructing scatter graphs using performance and prescribing cost data**

Information collected by prescribing teams, at both national and local levels, traditionally focused on costs and on prescribing initiatives, such as reducing use of drugs of limited clinical value and driving up the percentage of generic items used. The analysis carried out by prescribing teams could be weighted for age, sex and deprivation. However, clinicians frequently criticised this reporting method, as it failed to recognise disease prevalence, the quality of prescribing and clinical outcomes. The introduction of QOF in April 2004 as part of the new General Medical Services contract allowed PCTs to compare clinical outcomes linked to disease registers and prescribing data. This comparison provided PCTs with a powerful tool to evaluate cost effectiveness and prescribing outcomes. Effective monitoring of prescribing data is essential to ensure quality, monitor differences between practices and evaluate programme effectiveness.
The prescribing data are extracted from the ePACT database maintained by the NHS Business Services Authority Prescription Services, and used by all stakeholders working with analysis of prescribing.

The scatter graph is constructed by mapping prescribing costs against QOF outcomes in a number of therapeutic areas. Rotherham considered the following areas for comparison:

<table>
<thead>
<tr>
<th>Prescribing cost in disease area</th>
<th>Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spend on lipid-lowering drug divided by number of patients on coronary heart disease (CHD), diabetes and stroke registers</td>
<td>Percentage of CHD, diabetes and stroke patients with a cholesterol level less than 5 mmol/l in the last 15 months (QOF CHD 8, stroke 8, DM 17)</td>
</tr>
<tr>
<td>Spend on anti-hypertensives (thiazides, ACE and A2RBs, CCBs, beta-blockers, alpha-blockers) divided by number of patients on the hypertension register</td>
<td>Percentage of hypertensive patients with a blood pressure less than 150/90 mmHg in the last 15 months (QOF BP 5)</td>
</tr>
<tr>
<td>Diabetes prescribing spend divided by number of patients on the diabetes register</td>
<td>Percentage of patients with diabetes with HbA1c of 7.4 or below in the last 15 months (QOF DM 20)</td>
</tr>
<tr>
<td>Respiratory prescribing spend divided by number of patients on the chronic obstructive pulmonary disease (COPD) and asthma registers</td>
<td>Total COPD and asthma admission rates per 100,000 are grouped together because pharmaceutical interventions are often the same for both conditions and complications in hospital coding mean that admissions for asthma are often coded as COPD and vice versa. Percentage of patients with COPD with a record of FeV1 in the last 27 months (QOF COPD 6) or any other QOF indicator was not considered suitable as the indicators do not indicate disease control</td>
</tr>
</tbody>
</table>

**Presentation of data**

The analysis is presented to GP practices in the form of a scatter graph produced using a spreadsheet program, such as Excel. The average prescribing cost per patient on the relevant disease register is plotted on the vertical axis and the QOF outcome or hospital admission rate is plotted along the horizontal axis. (See Figure 3.)

All practices are identified by number on the graphs, as there is a local agreement in place to share information in order to raise standards in primary care. Comparisons between identified practices enable practitioners to reflect on their own prescribing behaviour and encourage poorly performing GPs to improve.
The presentation of data in such a way that individual practices can be identified and benchmarked itself provides substantial leverage to prompt change by some practices.

**Summary of results**

The analysis in each area established that high prescribing costs are not necessarily associated with better clinical outcomes. This work clearly indicated that there was significant variation in equality of access to those prescribing interventions that have the greatest impact on clinical outcomes or equity in provision across the PCT area. In particular:

- cholesterol levels could be lowered by the use of low-cost statins
- use of expensive anti-hypertensives and poly-pharmacy did not result in greater reductions in blood pressure
- high prescribing costs in the management of diabetes were not directly associated with greater proportions of patients with HbA1c of 7.4 or less
- use of high-dose and high-cost steroid inhalers did not reduce the number of emergency admissions for asthma and COPD.

**Implementation of change**

As part of the Medicines Management element of QOF, practices have to meet with a prescribing adviser annually to agree an action plan. At these practice visits, the analysis was discussed and a joint action plan and programme of support was agreed, with particular emphasis and support concentrated on the practices in greatest need.

Support included the following elements.

- A named Medicines Management Pharmacist Lead was identified for each practice to provide advice on the local and national guidelines as well as support on the IT clinical systems to search for patients who might need a medication review.
- Emphasis was placed on helping practices with audits, work plans, training and identification of patients not being offered ideal interventions. The prescribing team created a methodology to help practices identify patients to prioritise for medication reviews.
- The prescribing team worked with primary care to develop audit protocols to identify the numbers of patients taking medication within the guidelines for chronic conditions using the GP computer system. These had to be adapted for three GP computer systems used in the area and checked to ensure accuracy and consistency between the systems so that results could be compared effectively across the Rotherham PCT.
CASE STUDY: COST EFFECTIVE MANAGEMENT OF BLOOD SUGAR IN PATIENTS WITH DIABETES

Analysis of PCT-wide data for Rotherham in 2004/05 showed it to compare poorly with other districts in South Yorkshire and across the Yorkshire and Humber region. The percentage of patients achieving the HbA1c target of 7.4 or below was one of the lowest in South Yorkshire, and the average prescribing cost was relatively high. (See Figure 3.)

Analysis of average spend per patient on prescribing for diabetes by practice demonstrated a wide variation.

**Figure 1: Prescribing costs per diabetic patient versus percentage of diabetic patients with HbA1c at or below 7.4 in last 15 months, North England, Apr. – Dec. 2005**

NHS Rotherham’s prescribing cost and achievement on QOF indicator DM 6 (percentage of patients with HbA1c at or below 7.4) was cause for concern. Rotherham was 8th (out of 9 PCTs in South Yorkshire) on achievement against DM 6, with 59.1% of patients achieving the target – only North Sheffield was lower – and below the North of England average. (The South Yorkshire average is 63.7%; the North of England average is 61.8%.)

NHS Rotherham’s average spend per patient was however, above average for the North of England and the second highest in South Yorkshire. Barnsley had a higher average spend per patient but, unlike Rotherham, had an above average performance with 67.3% of patients achieving QOF target DM 6.
In summary, Rotherham has above average costs and below average performance.

**Figure 2: Spend per diabetic patient, by GP practice, Rotherham 2005/06**

The variation in average spend did not, however, correlate at all with outcome of care, as Figure 3 makes clear.

**Figure 3: Diabetic prescribing costs per diabetic patient versus percentage of patients with HbA1C at or below 7.4 in last 15 months, GP practices in Rotherham, April 2005 to March 2006**

Note: numbers in graph refer to individual practices.
The PCT then developed an action plan aimed at moving all practices towards the bottom right-hand quadrant of Figure 3, to join those practices already achieving low cost, but with a high proportion of patients meeting the HbA1c target.

Further analysis was carried out by practice, to help establish how significant improvements could best be achieved in each case. This included analysis of prevalence on diabetes registers by practice (see Figure 4). It also involved analysis of drugs prescribed, for comparison against management guidance and also against ‘champion’ practices achieving good outcomes at low cost.

As a result of this analysis, each practice was provided with guidance on how it might best set about improving outcomes while at the same time reducing costs. Three examples of the summarised analysis and the type of guidance given are included below (see Practice 8 page 8, Practice 33 page 9 and Practice 2 page 10).

The information given was generally well received by practices, and support in implementation of subsequent action plans was provided by the PCT.

Figure 4 shows the variation in the prevalence of diabetes between practices as captured on the diabetes registers kept by individual practices.

Some of the practices that reported the lowest prevalence of diabetes also had the highest diabetic prescribing spend per diabetic patient. This could indicate that they are prescribing for patients who are missing from their diabetic registers and, therefore, possibly not receiving systematic care or being monitored in line with QOF indicators.

Figure 4: Variation in prevalence of diabetes across GP practices in Rotherham, April 2006 to March 2007
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The following examples show a summary of the analysis and the type of guidance given to practices, using one representative from each ‘outlier’ quadrant.

**Practice 8: High cost, poor outcomes**

<table>
<thead>
<tr>
<th>Observation</th>
<th>Evidence</th>
<th>Comparison</th>
<th>Action</th>
<th>Operator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low performance on QOF indicator DM 6</td>
<td>38.89%</td>
<td>PCT average = 59.1% of patients with HbA1c ≤7.4</td>
<td>Diabetes medication review</td>
<td></td>
</tr>
<tr>
<td>% of practice population registered as diabetic</td>
<td>2.12%</td>
<td>PCT average = 3.8%</td>
<td>Diabetes register validation</td>
<td>Run QUEST query • review patients identified – 30 additional patients found (Sep. 2006)</td>
</tr>
<tr>
<td>High diabetic prescribing costs</td>
<td>£311.99 per patient</td>
<td>PCT average = £257.66 per patient</td>
<td>Diabetes register validation</td>
<td></td>
</tr>
<tr>
<td>Glitazone usage higher than average</td>
<td>£474.41 per patient</td>
<td>PCT average = £305.26 per patient</td>
<td>Diabetes register validation and audit of oral diabetes therapy within the practice</td>
<td></td>
</tr>
<tr>
<td>Insulin prescribing costs lower than expected</td>
<td>£654.22 per patient</td>
<td>PCT average = £1,145.39 per patient</td>
<td>Audit of patients on maximal oral therapy with HbA1c above 7.4, to be shared with the diabetes specialist nurse</td>
<td></td>
</tr>
</tbody>
</table>

- The practice should develop a method of systematic medication review for all diabetic patients to ensure therapy is maximised and focused on achieving DM 6 (Hb1Ac at or below 7.4). The practice may also wish to review CHD prevention in its diabetic patients.
- The low percentage of the practice population registered as diabetic and the relatively high treatment cost per diabetes patient could indicate that there are patients receiving diabetes medication who do not appear on the practice’s diabetes register.
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• The higher than expected costs for glitazones could also indicate that there are diabetic patients who do not appear on the practice register. The practice may wish to audit its prescribing against the Rotherham Diabetes Guidelines, and ensure that glitazones are not prescribed as first/second line agents.

• The lower than average (PCT) insulin prescribing costs could be indicative of a reluctance to initiate insulin and this could impact on the practices performance against QOF marker DM 6.

Practice 33: Low cost, poor outcomes

<table>
<thead>
<tr>
<th>Observation</th>
<th>Evidence</th>
<th>Comparison</th>
<th>Action</th>
<th>Operator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low performance on QOF indicator DM 6</td>
<td>53.15%</td>
<td>PCT average = 59.1% of patients with Hb1Ac ≤7.4</td>
<td>Diabetes medication review</td>
<td></td>
</tr>
<tr>
<td>Low metformin prescriber</td>
<td>£106.35 per patient</td>
<td>PCT average = £153.83 per patient</td>
<td>Review all patients with Hb1Ac ≤7.4 and not taking metformin; examine the practice’s use of metformin in the treatment of diabetes</td>
<td>204 patients identified who could benefit from metformin (Oct. 2006)</td>
</tr>
<tr>
<td>Insulin prescribing costs lower than expected</td>
<td>£897.11 per patient</td>
<td>PCT average = £1,145.39 per patient</td>
<td>Audit of patients on maximal oral therapy with an Hb1Ac above 7.4, to be shared with the diabetes specialist nurse</td>
<td></td>
</tr>
</tbody>
</table>

• The practice should develop a method of systematic medication review for all diabetic patients to ensure therapy is maximised and focused on achieving DM 6 (HbA1c at or below 7.4). The practice may also wish to review CHD prevention in its diabetic patients.

• EPACT data suggest that the practice prescribes less metformin than other practices in Rotherham. The practice may wish to examine its use of metformin in the management of diabetes.

• Insulin prescribing costs lower than the average for the PCT could indicate a reluctance to initiate insulin treatment, and this could inhibit the practice’s performance against QOF indicator DM 6.
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**Practice 2: High cost, good outcomes**

<table>
<thead>
<tr>
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<th>Evidence</th>
<th>Comparison</th>
<th>Action</th>
<th>Operator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glitazone usage higher than average</td>
<td>£419.63 per patient</td>
<td>PCT average = £305.26 per patient</td>
<td>Audit of oral diabetes therapy within the practice</td>
<td></td>
</tr>
<tr>
<td>Insulin prescribing costs higher than expected</td>
<td>£2,145.38 per patient</td>
<td>PCT average = £1,145.39 per patient</td>
<td>If the practice initiates insulin treatment, it may wish to review insulin usage</td>
<td></td>
</tr>
</tbody>
</table>

- The practice may wish to audit its prescribing against the Rotherham Diabetes Guidelines and ensure that glitazones are not prescribed as first- or second-line agents.
- The relatively high insulin costs may indicate that practice is over-relying on the use of analogue insulins and not using the complete range of insulins in its treatment of diabetes.

**Conclusions**

The analytical support provided in this way was well received by general practices as it was based on outcomes and prescribing costs and was underpinned by a strong evidence base. The process was widely acknowledged as a useful step towards improving public health in the area.

NHS Rotherham considers that this initiative was positive and worthwhile. Presenting the data in the form of scatter graphs has a strong visual impact and was easily understood and well received by practices across the PCT area.

This analytical approach has contributed to improved prescribing practices. Specifically, the initiative has enabled the prescribing team to implement an over-arching system designed to bring greater uniformity in the treatment offered to patients, on the basis of evidence, regardless of the practice attended.

The analysis of prescribing costs against clinical outcomes has led practitioners to reflect on their clinical practice and in some cases to make significant changes to their prescribing behaviour. These changes were initially supported by work with practices to develop practice-specific action plans and by offering practices tailored support. The analysis is continuing and now forms part of NHS Rotherham’s performance management process.

It was clear from the outset that practices that were better managed, including better systems management, were achieving lower prescribing costs with better clinical outcomes.
Subsequent analysis shows practices leaving the high cost, poor outcome quadrant and moving to either high cost and good outcomes or low cost and poor outcomes. To date no practice has made the shift to low cost and good outcomes. However, variation from the mean appears to be narrowing, so there is greater equity of performance across practices.

NHS Rotherham is now considering introducing a performance review ‘clinic’ for practices that fail to improve on the quality agenda, especially if they continue to overspend, and implementing Annex 8 of QOF (excessive and inappropriate prescribing) in practices that are persistent outliers and do not implement agreed action plans.
APPENDIX: EXAMPLE OF THE ANALYSIS FOR HYPERTENSION USING THE QOF BP 5 (PERCENTAGE OF PATIENTS ACHIEVING A BP OF 150/90 OR LESS)

Figure A1: Prescribing costs for anti-hypertensives per patient on hypertension register versus percentage of patients with blood pressure at or below 150/90 at last test, Rotherham.

Produced by Eloise Summerfield, Practice Support Pharmacist, NHS Rotherham, July 2009
Note: each number represents a GP practice in Rotherham.

**Top left quadrant** – high cost, poor outcomes. Identifies practices with a high spend on anti-hypertensive medication (including thiazides, ACE and A2RBs, CCB, beta-blockers and alpha-blockers) but with poor blood pressure control as identified by QOF. These are the practices in which further investigation may be required.

**Top right quadrant** – high cost, good outcomes. Identifies practices with high prescribing costs but good blood pressure control.

**Bottom left quadrant** – low cost, poor outcomes. Identifies practices where spend on hypertensive agents was low and clinical outcomes were poor. These practices require further investigation as under-prescribing may indicate practices that appear not to be treating patients adequately. The management of blood pressure in these practices needs to be improved to increase life expectancy.

**Bottom right quadrant** – low cost, good outcomes. Identifies practices with low prescribing costs on hypertensive agents and good management of blood pressure. Practices in this quadrant demonstrate the most cost effective prescribing and greatest benefit to patients, and can be used to demonstrate and share good practice.
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If you want more information on the examples contained in this guide please contact HINST on 0207 972 3377 or email hinst@dh.gsi.gov.uk