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Research papers

Application of evidence-based prescribing indicators in primary care: a pilot

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ABSTRACT

Background Quality of prescribing is an important clinical governance issue. Current indicators of prescribing in primary care are not accurate in measuring the quality of prescribing as they are based on overall levels of prescribing without any link to clinical data of patients. We have developed a number of prescribing indicators that are linked to clinical data of elderly patients admitted to secondary care facilities. We studied the applicability of these secondary care prescribing indicators to primary care, to measure the quality of prescribing in elderly patients and to assess the effects of educational intervention in improving the quality of prescribing.

Methods This was a longitudinal open intervention study in a single practice. Computerised prescribing data for all patients 65 years and over were collected before and after intervention. Indicators included purely descriptive data as well as clinical appropriateness data. Clinical data for assessing the appropriateness of prescribing were collected from general practitioner (GP) case notes. Data were collected and recorded using a customised Microsoft access database.

Results Five out of the 14 indicators were not applicable in the primary care setting due to idiosyncrasies of computerised prescribing data, medical record keeping and deficiencies in the data entry software. Following the intervention, generic prescribing improved from 85 to 93% ($P = 0.002$), documentation of frequency of as required (prn) items improved from 60 to 81% ($P < 0.001$), the appropriate use of benzodiazepines improved from 46 to 63% (not significant [NS]) and that of β_2 agonist/steroid use from 85 to 90% (NS). The appropriate use of antithrombotics in atrial fibrillation remained at 73% and the appropriate use of aspirin in ischaemic heart disease fell from 77 to 75% (NS).

Conclusions Some modifications were required to increase the applicability of hospital inpatient indicators in primary care. However all indicators of appropriate prescribing were applicable to

primary care allowing an accurate measurement of quality of prescribing. There was a trend towards improvement in most indicators following intervention, resulting in improved quality of prescribing, but the use of aspirin in ischaemic heart disease could have been affected differentially in the two data collections by the use of over-the-counter aspirin not showing in the prescribing data.

Keywords: clinical data, clinical governance, prescribing

Introduction

Suboptimal prescribing for elderly patients has been an area of concern for many years. Proven and effective treatments such as aspirin in ischaemic heart disease, beta-blockers following myocardial infarction and anticoagulants in atrial fibrillation are underused in elderly patients.[1,2] On the other hand, inappropriately high usage of drugs like benzodiazepines and neuroleptics has resulted in excessive unwanted effects.[3] The prevalence of inappropriate prescribing in elderly patients in primary care is difficult to assess because of lack of agreed indicators of appropriate prescribing.[4] Prescribing indicators are required to monitor drug use and assure quality of prescribing. In the recently published *National Service Framework* for Older People in the United Kingdom, prescribing indicators were recognised as key tools in auditing the appropriate use of medicines.[5] A number of prescribing indicators have been developed based on PACT (prescribing analysis and cost) data in the UK. Although useful to assess prescribing costs, PACT has no personal, clinical or co-prescription data and therefore has a limited role in examining the quality of prescribing.[6] A recent survey of all health authority medical and pharmaceutical advisers and lead prescribing advisers in the UK showed that PACT indicators would allow only a limited examination of prescribing at a general practice, primary care group or health authority level.[7] To date, no indicators of prescribing quality designed specifically for elderly patients in primary care have been described in the UK.

To influence the quality of prescribing by physicians, various interventions ranging from simple dissemination of printed material to complex computerised reminding systems have been used. Although all interventions aim to provide information regarding deficiencies in prescribing, and methods of improving prescribing, studies using them have shown that a key factor in their success is the method of intervention used.[8,9] Also, previous studies on interventions to improve the quality of prescribing have either focused on a particular disease, or used indicators that reflect overall levels of prescribing, without knowledge of whether such prescribing is appropriate to each individual patient.[4]

To identify and improve suboptimal prescribing for elderly patients and to evaluate the benefit of interventions designed to enhance prescribing we have developed a number of prescribing indicators based on prescription data. They comprise indicators that assess general prescribing trends such as use of generic drugs, mean number of drugs per patient, etc., and also indicators that assess evidence-based prescribing such as use of aspirin in ischaemic heart disease, anticoagulants in atrial fibrillation, etc. in each individual patient, assessed by examining their case notes. Their use in secondary care has been reported.[10] We applied the same indicators to primary care initially to study their applicability and then to use them to study the effects on quality of prescribing following intervention.

Methods

Fourteen indicators developed for secondary care were divided into three groups:

- purely descriptive indicators, e.g. number of items per patient, number of black triangle drugs
- indicators of potentially harmful or unnecessary prescribing, e.g. prescribing H_2 antagonists concurrently with proton pump inhibitors, β_2 agonist inhaler duplication, use of long-acting oral hypoglycaemic agents, use of proprietary names, failure to document allergies, failure of documentation of frequency of prn items
- evidence-based indicators of appropriate prescribing, e.g. anticoagulant or aspirin 300 mg in atrial fibrillation, β_2 agonists with/without steroids in chronic airways obstruction, aspirin in angina, use of benzodiazepines.

The study was conducted in a practice on the edge of Luton serving a mixed urban, rural population of 6100 people, mostly European. There are three full-time and two assistant GPs, and four practice nurses.

Data collection

All the secondary care prescribing indicators were included in the study to enable a comparison of their usefulness in primary care. Prescribing data were collected twice. Following the first data collection, the results were presented to the GPs of the study practice. Three months after the presentation, a second data collection was performed to study the effects of intervention on prescribing quality.

Prescribing data for all patients aged 65 years and above, over a period of 6 months for the first collection and over a period of 4 months for the second collection were downloaded from the Torex System 5 software of the study practice, which issued all its prescriptions by computer except on home visits. The prescribing data consisted of a unique number and the date of birth of the patient in addition to their medications.

Inclusions

- All acute and repeat prescriptions issued to patients aged 65 years and above during the study periods were included. This enabled us to capture all those patients with chronic conditions such as atrial fibrillation, obstructive airways disease and ischaemic heart disease who, because of their stable medical condition, were reviewed at longer intervals and were issued a prescription usually of not more than 2 months' duration. Patients who were issued prescriptions for a duration longer than 2 months were those on long-term endocrine replacement and antihypertensive therapy for a stable blood pressure.

Exceptions

- Prescriptions for dressings and topical preparations other than glyceryl trinitrate (GTN) preparations were excluded.
- Modified release and long-acting proprietary preparations of antiepileptic drugs were categorised as generic drugs in keeping with guidance on prescribing described in the *British National Formulary*.[11]
- Prescriptions issued on home visits were excluded. These constituted less than 1% of the total prescriptions.

The prescribing data were analysed using a customised Microsoft access database developed for secondary care and used in the *National Sentinel Audit of Evidence-based Prescribing for Older People*.[12] The software identified all those patients who were on 'key' drugs such as benzodiazepines, glyceryl trinitrate, digoxin and β_2 agonist inhalers, prompting clinical data collection to assess the appropriateness of prescribing. The clinical data were derived from the GP notes by two hospital doctors who were previously trained in data collection for prescribing indicators in secondary care. They used predefined algorithms (see Figures 2–5)[10] based on published clinical trials to determine the appropriateness of prescribing.[3,13–15] The algorithms were approved by the GPs for use in primary care.

Intervention

The results of the first data collection, which included:

- a detailed description of all the 14 secondary care prescribing indicators
- the problems encountered in their application to primary care
- the results of all the applicable indicators

were presented to the GPs and the practice nurses by means of an audio-visual presentation by the two hospital-based data collectors. A list, identifying all those patients in whom prescribing was deemed inappropriate by the hospital-based data collectors, was given to the GPs. The GPs identified the case notes of these patients and reviewed their prescribing on an opportunistic basis. In addition, patients who were unlikely to be attending a review appointment were specially invited to the surgery to review their prescribing. The second collection started 3 months following the presentation of the data and ended when the GPs felt confident that they were able to

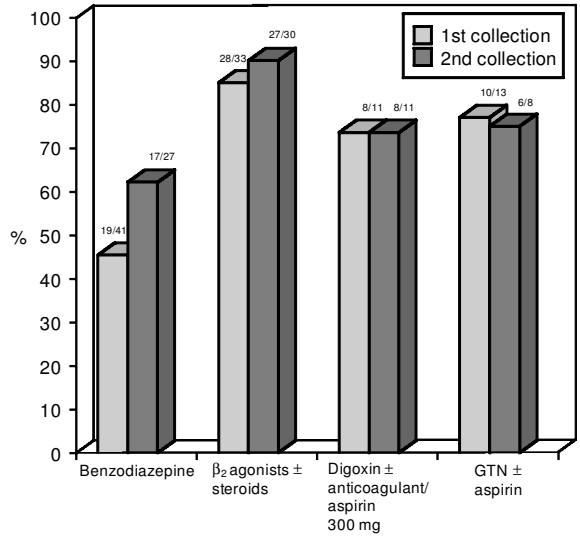


Figure 1 Appropriate prescribing using evidence-based indicators before and after intervention (each histogram shows the percentage of appropriate prescribing with the absolute numbers on the top of each bar)

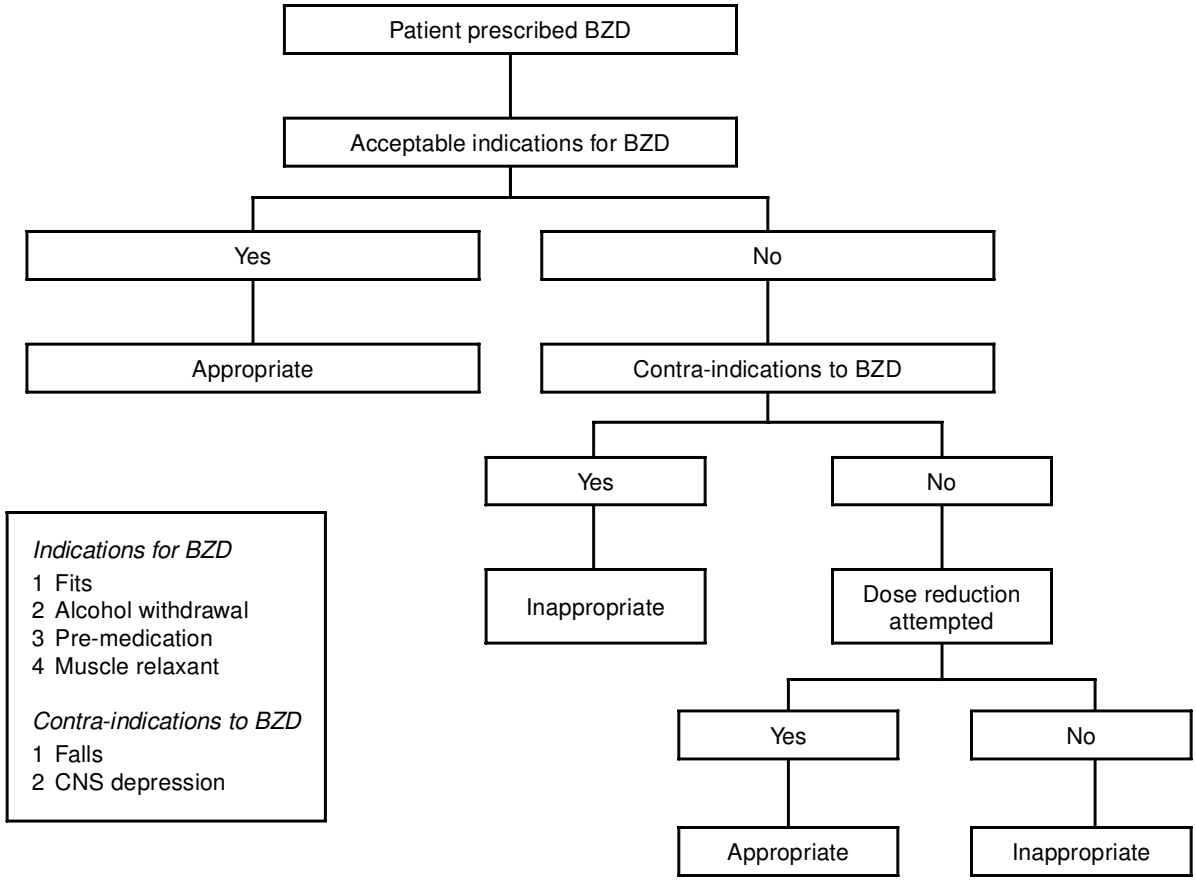


Figure 2 Algorithm to assess appropriate use of benzodiazepines (BZD)

review all their elderly patients at least once, which took a total of 4 months.

Statistical analysis

To assess the effects of intervention, we used the chi-squared test on purely descriptive indicators and indicators of harmful or unnecessary prescribing and the two-tailed Fisher's exact test on indicators of appropriate prescribing. A P value of < 0.05 was considered to be statistically significant.

Results

Demographics of the study practice

The total number of patients aged 65 years and above registered with the practice was 428 for the first data collection and 397 for the second data collection with a mean age of 72.5 years. Males comprised 38% of the total elderly population. The number of patients 65 years and above in receipt of a prescription was 363/428 (85%) for the first collection and 317/397 (80%) for the second collection. The second collection was conducted approximately 18 months after the first collection. The percentage of elderly population is low in our study practice because the practice area mainly consists of new, low-cost housing, designed for first-time buyers who are often young couples.

Applicability of the indicators

Information regarding the duration of each prescription, and a standardised method for allergy status documentation were lacking. The Torex System 5 software did not enable the recording of 'no known drug allergy'. Thus documentation of allergy and indicators of drug/class duplication could not be assessed. Ninety-eight patients in the first collection and 76 patients in the second collection required clinical data to assess the appropriateness of prescribing. The hospital team identified 61 prescriptions where prescribing was inappropriate. After each data collection, a list of all the patients where the hospital team identified inappropriate prescribing was provided to the GPs. Because of their greater familiarity with their patients, the GPs were able to demonstrate 10 out of the 61 prescriptions where the hospital team had incorrectly defined prescribing as inappropriate. The data presented here reflect the amended results. Patients using glyceryl trinitrate

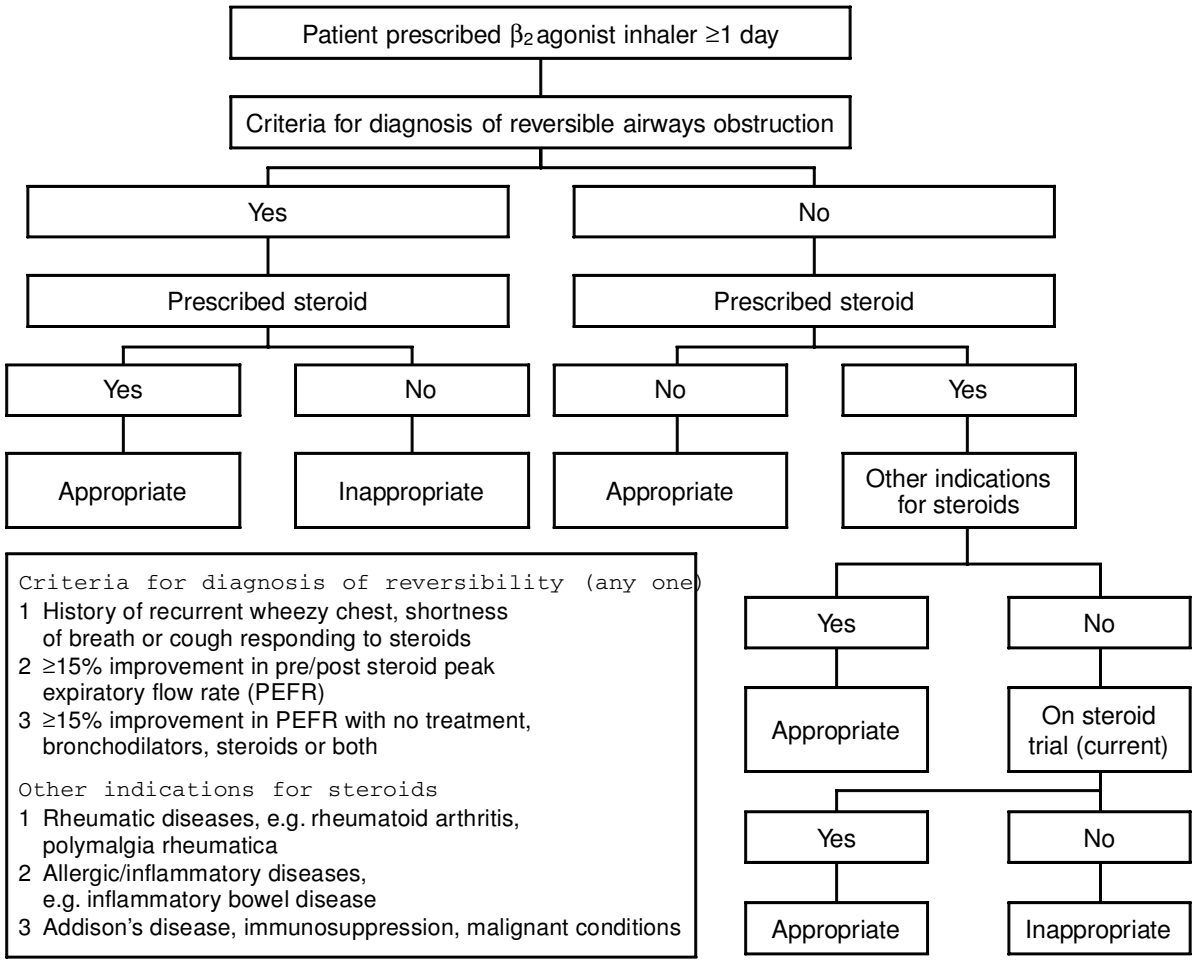


Figure 3 Algorithm to assess appropriate use of steroids with β_2 agonists

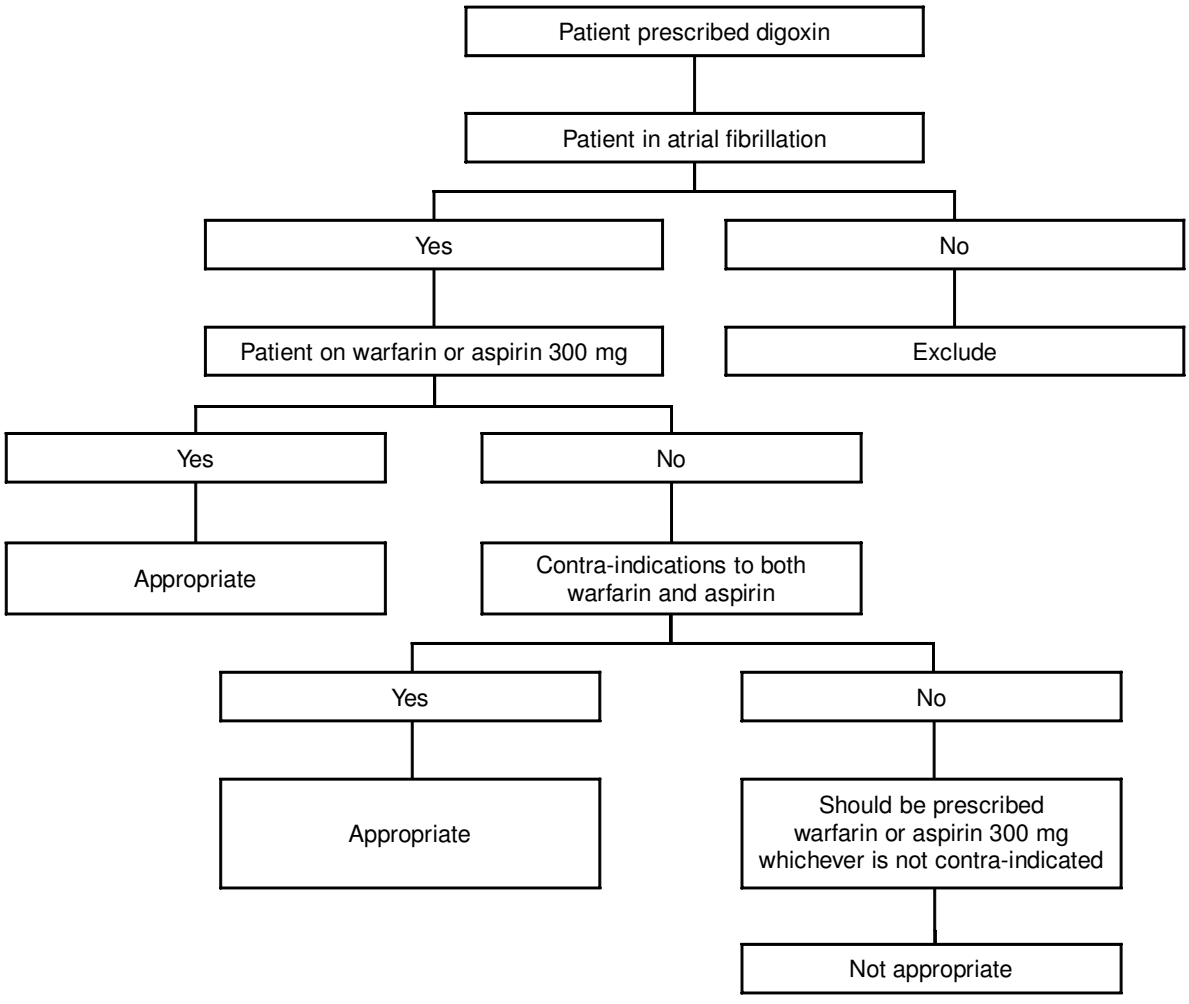
patches for musculoskeletal conditions (frozen shoulder) identified during the clinical data collection were excluded when analysing the appropriate prescribing of glyceryl trinitrate with aspirin for ischaemic heart disease.[16] The prevalence of appropriate use of glyceryl trinitrate ± aspirin may have been adversely affected by unrecorded over-the-counter (OTC) aspirin use. However, only three cases of apparent inappropriate aspirin non-prescription were seen in the first collection and two cases in the second collection.

A later search of the practice database for all patients who had received a prescription for glyceryl trinitrate and had a diagnosis of ischaemic heart disease for the period January 1998 to September 1999, when the data were collected, revealed 20 patients prescribed glyceryl trinitrate but not included in this study because their prescriptions for glyceryl trinitrate fell outside the study periods. These patients' data were not included as they were not identified prospectively.

Improving the quality of prescribing

There was a significant increase in the percentage of generic prescribing from 85% to 93% ($P = 0.002$) and the documentation of frequency of as required drugs from 60% to 81% ($P < 0.001$). The use of black triangle drugs increased from 8% to 9% (not significant [NS]) (see Table 1).

Appropriate use of benzodiazepines increased from 19/41 (46%) to 17/27 (63%) following intervention as did the appropriate use of inhaled β_2 agonists with or without a steroid in chronic stable airways disease, from 28/33 (85%) to 27/30 (90%). These trends however were not significant. Appropriate use of antithrombotics in atrial fibrillation and aspirin in angina showed little change (see Figure 1).



Warfarin is more effective than aspirin 300 mg in preventing stroke in atrial fibrillation

Contra-indications to warfarin and aspirin

1	Previous/potential gastrointestinal bleed*	7	Clotting disorder*
2	Previous intracranial haemorrhage*	8	On heparin (any type)*
3	Haemorrhage with anticoagulant	9	Chronic alcoholism
4	Allergy to aspirin*/warfarin	10	Uncontrolled hypertension
5	Repeated fits/falls/head injury	11	Poor drug compliance
6	Death of patient imminent	12	Diagnostic CT scan not done*

*Applies to aspirin alone

Figure 4 Algorithm to assess appropriate use of anticoagulants and aspirin with digoxin

Discussion

Applicability of indicators to primary care

The primary care computerised prescribing data posed several problems.

- Documentation of allergy could not be reliably assessed as it was impossible to differentiate patients who had no allergies from patients whose allergy status was not documented on the Torex system 5 software. This was further complicated by lack of a standardised manual recording of allergy status in the GP case notes of each individual patient.
- Indicators of drug/class duplication could not be assessed as the prescribing software combined the original and repeat prescriptions with no data

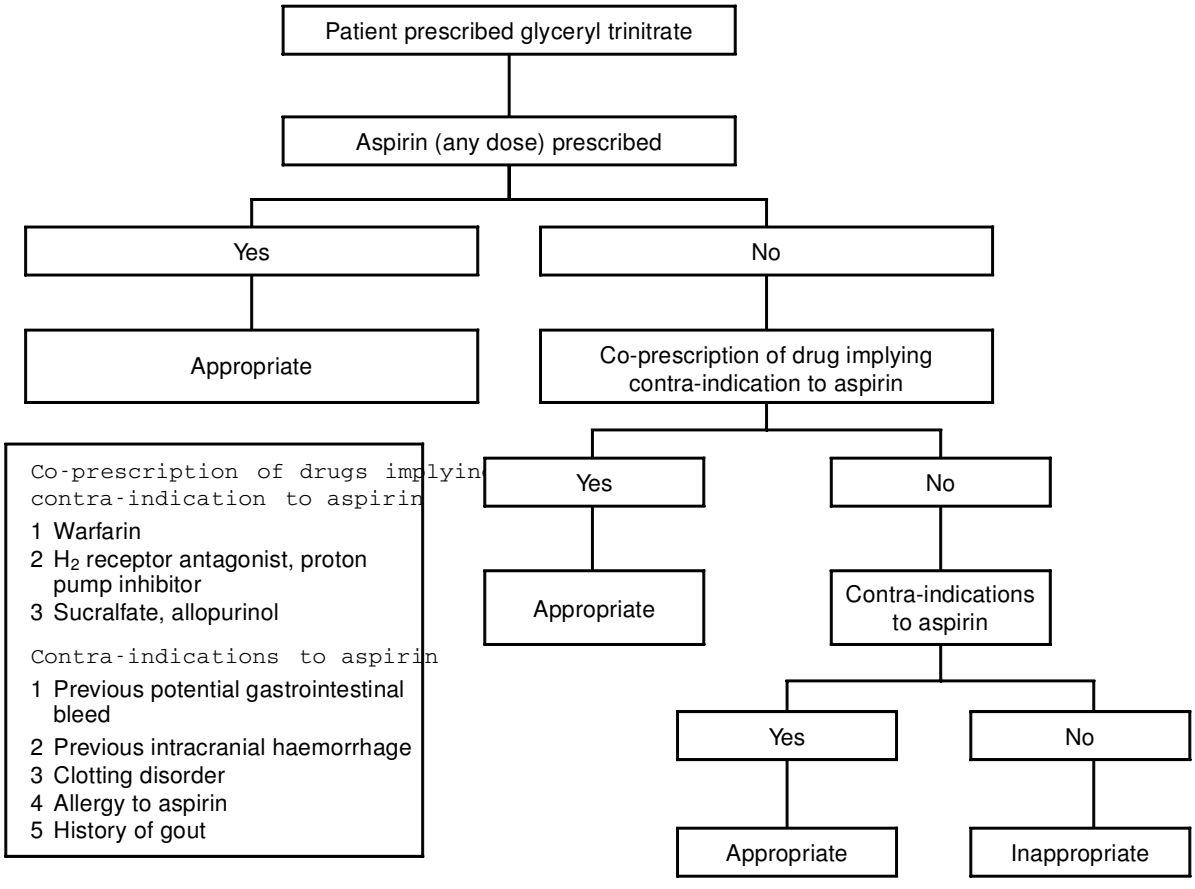


Figure 5 Algorithm to assess the appropriate use of aspirin in patients with angina

available on duration of each script. In addition, several items of data such as dosage and total quantity to be dispensed were not available for all drugs, making it impossible to calculate the duration of all prescriptions. Modifying prescribing data collection to include the duration of each script could improve applicability of this indicator.

- The indicator assessing the use of aspirin in ischaemic heart disease is affected by the use of OTC aspirin. The scale of such use could not be determined from our data. The effect of OTC aspirin could be overcome by specifically documenting such use in the clinical notes. After the completion of our study, the Luton Primary Care Group, as a part of its prescribing action plan and incentives scheme, actively promoted the use of aspirin in patients with ischaemic heart disease as a prescribing incentive and will use the glyceryl trinitrate ± aspirin indicator to assess its use. Such schemes could improve documentation of OTC aspirin use.
- Subsequent investigation showed that the prevalence of use of glyceryl trinitrate was underrecorded. Twenty patients who had the diagnosis of ischaemic heart disease and were currently receiving glyceryl trinitrate were not included because their prescriptions fell outside the study periods.

Unlike in secondary care where most admissions of ischaemic heart disease are acute, most patients in primary care with ischaemic heart disease are stable and on anti-anginal agents resulting in infrequent prescriptions for glyceryl trinitrate. Collecting prescribing data over a longer period of time or using a practice disease register should identify all patients on glyceryl trinitrate for ischaemic heart disease. However, the failure of the initial prescription data to identify all patients prescribed glyceryl trinitrate should not in itself bias our appropriateness data.

All the indicators of appropriate prescribing were applicable to primary care. Since these indicators require clinical data, familiarity with GP notes is important in collecting such data in order to accurately measure the quality of prescribing, and can be achieved by proper training.

Intervention

We used a novel form of intervention which combined an audio-visual presentation (of the

findings of the first data collection) and written feedback (which included the list of all patients where prescribing was described as inappropriate) to the GPs. We used this intervention as previous studies using simple dissemination of printed materials (drug bulletins, guidelines), distribution of computerised patient-specific medication were inferior to face-to-face presentations in improving the quality of prescribing.[8,9,17–19] We had also previously used audio-visual presentations and found them effective in our secondary care study.[20] However, the intervention failed to demonstrate a statistically significant effect on quality of prescribing. Unlike other studies that showed positive results using similar intervention based on academic detailing, this study did not have a control group with no intervention for comparison.[21] Our decision to design the study this way was because it was designed as a single practice pilot study. The design of our study was longitudinal, reflecting real-life general practice and establishes a pragmatic approach to application of the prescribing indicators in primary care. It provides a basis for any future randomised controlled trials exploring the benefits of intervention in improving evidence-based prescribing in primary care. Studies of indicators comparing prescription rates with admission rates were limited by varying case mix in examining the quality of prescribing.[22] The evidence-based indicators of appropriate prescribing described here require clinical data for each prescription and were therefore more accurate in examining the quality of prescribing and were not influenced by case mix. Previous studies have observed that indicators tailored to assessing individual patients are likely to measure the prevalence of appropriate prescribing more accurately.[4,7]

The rate of appropriate prescribing for all indicators was high in our study practice. The appropriate use of digoxin with an antithrombotic was 73% while the national average observed in the *National Sentinel Clinical Audit of Evidence-based Prescribing for Older People* was 42% in primary care and 53% in

Table 1 Change in prescribing following educational intervention

	First collection	Second collection
Total number of patients above 65 years	428	397
Total number of patients above 65 years receiving a prescription	363	317
Purely descriptive indicators		
Mean number of items per patient taking drugs	4.24	3.84
Patients prescribed black triangle drugs	8%	9%
Indicators of potentially harmful or unnecessary prescribing		
Use of generic names	85%	93%*
Documentation of frequency of administration of prn items	60%	81%*
Use of long-acting oral hypoglycaemic agents	0%	0%
Indicators of appropriate prescribing		
Appropriate use of a benzodiazepine	46% (19/41)	63% (17/27)
Appropriate use of a β_2 agonist ± steroid in chronic stable airways disease	85% (28/33)	90% (27/30)
Appropriate use of anticoagulant/aspirin 300 mg in atrial fibrillation	73% (8/11)	73% (8/11)
Appropriate use of aspirin in angina	77% (10/13)	75% (6/8)

*$P < 0.05$

secondary care in the initial audit.[12] Studies have shown that several interacting factors contribute to inappropriate prescribing decisions. These include failure to keep abreast of recent developments in pharmacotherapy, simple errors of oversight or omission – particularly relevant to high volume practices, over-promotion of drugs by drug company representatives and over-reliance on clinical experience rather than scientific data.[23,24] The GPs in our study practice had taken a keen interest in prescribing work including a number of audit projects to improve their quality of prescribing prior to this study and were also actively involved in the development of a Bedfordshire formulary.[25] Although previous prescribing audit work may have had a large influence on the performance of prescribing indicators, it did not interfere with the application of the prescribing indicators and the assessment of quality of prescribing in our study.

The most marked improvement in the rate of appropriate prescribing was seen for benzodiazepines, largely due to a reduction of new prescriptions (27 prescriptions for benzodiazepines in the second collection compared to 41 in the first collection). Although the effect of intervention was most pronounced in the number of prescriptions for benzodiazepines, a general trend towards decreased number of prescriptions was observed in the second collection, with the mean number of items per patient decreasing from 4.24 to 3.84. A recent randomised controlled trial on elderly patients on regular psychotropic medications showed that withdrawal of the psychotropic medication reduced the number of falls by 60% compared with those who continued to take them, but permanent withdrawal could not be achieved in the majority of the patients due to drug dependence.[26] Reducing the number of new prescriptions for psychotropic medication in the older adults through a prescribing incentive scheme would be a useful addition to existing options in reducing the total burden of psychotropic medication.

Although our approach is designed to enhance quality not minimise costs, previous studies have shown significant reductions in cost by increasing the use of generic drugs.[27,28] Also generic prescribing was ranked a top cost ratings indicator by lead prescribing advisors across the UK.[7] Following intervention, the generic prescribing in our study practice had improved from 85% to 93%.

There are however a number of limitations. The indicators of appropriate prescribing cover a number of chronic conditions such as ischaemic heart disease, chronic obstructive pulmonary disease, asthma, atrial fibrillation and benzodiazepine use. There are many other therapeutic areas not covered, and prescribing for those areas cannot be inferred from our findings. In addition with the study design employed we are unable to prove the value of the intervention. Nevertheless, we have demonstrated the applicability to primary care of a range of secondary care prescribing indicators for elderly patients that are not only useful in measuring general prescribing trends but more importantly can also accurately assess the quality of prescribing for certain diseases on an individual patient basis. They could be used by primary care trusts to promote evidence-based prescribing through prescribing incentive schemes and to develop audit standards common to both primary and secondary care.

Data collection and analysis in this study was carried out by doctors because they were experienced in the application of the prescribing indicators. Pharmacists or possibly members of other professions allied to medicine could be less expensive. The effects of such interventions on prescribing quality need to be established by larger studies involving several practices.

REFERENCES

1 Venturi F, Romero M and Togoni G (1999) Patterns of practice for acute myocardial function in a population of ten countries. *European Journal of Clinical Pharmacology* **54**: 877–86.

2 Antani MR, Beyth RJ, Covinsky KE *et al.* (1996) Failure to prescribe warfarin to patients with non-rheumatic atrial fibrillation. *Journal of General Internal Medicine* **11**: 713–20.

3 Sorock GS and Shimkin EE (1988) Benzodiazepine sedatives and the risk of falling in a community dwelling elderly cohort. *Archives of Internal Medicine* **148**: 2441–4.

4 Buetow SA, Sibbald B, Cantrill JA and Halliwell S (1996) Prevalence of potentially inappropriate long term prescribing in general practice in the United Kingdom, 1980–95: systematic literature review. *British Medical Journal* **313**: 1371–4.

5 Department of Health (2001) *Medicines and Older People: National Service Framework*. The Stationery Office: London, pp. 24–7.

6 Majeed A, Evans N and Head P (1997) What can PACT tell us about prescribing in general practice? *British Medical Journal* **315**: 1515–19.

7 Campbell SM, Cantrill JA and Roberts D (2000) Prescribing indicators for UK general practice: Delphi consultation study. *British Medical Journal* **321**: 425–8.

8 Avorn J and Soumerai S (1983) Improving drug-therapy decisions through educational outreach. *New England Journal of Medicine* **308**: 1457–63.

9 Ewans CE, Haynes RB, Birkett NJ *et al.* (1986) Does a mailed continuing education program improve physician performance? *Journal of the American Medical Association* **255**: 501–4.

10 Oborne CA, Batty GM, Maskrey V, Swift CG and Jackson SHD (1997) Development of prescribing

indicators for elderly medical inpatients. *British Journal of Clinical Pharmacology* **43**: 91–7.
11 British Medical Association and the Royal Pharmaceutical Society (2001) Guidance on prescribing. *British National Formulary*. BMA and the RPSGB: London.
12 Grant RL, Batty GM, Aggarwal R *et al.* (2002) National Sentinel Audit of Evidence-based Prescribing for Older People: methodology and development. *Journal of Evaluation and Clinical Practice* **8 (2)**: 189–98.
13 Stroke Prevention in Atrial Fibrillation Investigators (1994) Warfarin versus aspirin for prevention of thromboembolism in atrial fibrillation. Stroke prevention in atrial fibrillation study II. *Lancet* **343**: 687–91.
14 British Thoracic Society (1993) Guidelines on the management of asthma. *Thorax* **48**: S1–4.
15 Juul-Möller S, Edvardsson N, Jahnmatz S, Rosen A, Sorensen S and Omblus R (1992) Double blind trial of aspirin in primary prevention of myocardial infarction in patients with stable chronic angina pectoris. *Lancet* **340**: 1421–5.
16 Berrazueta JR, Losada A, Poveda J *et al.* (1996) Successful treatment of shoulder pain syndrome due to supraspinatus tendinitis with transdermal nitroglycerin. A double blind study. *Pain* **66**: 63–7.
17 Herschey CO, Porter DK, Breslau D and Cohen DI (1986) Influence of simple computerised feedback on prescription changes in an ambulatory clinic: a randomised clinical trial. *Medcare* **24**: 472–81.
18 Koepsell TD, Gurtel A, Diehr PH *et al.* (1983) The Seattle evaluation of computerised drug profiles: effects on prescribing practices and resource use. *American Journal of Public Health* **73**: 850–5.
19 Soumerai SB, McLaughlin TJ and Avorn J (1990) Quality assurance for drug prescribing. *Quality Assurance in Health Care* **2**: 37–58.
20 O'Brien EW, Mittra R, Puthrasingam S and Jackson SHD (1999) An intervention study: enhancing prescribing to inpatients using bespoke software. *Age and Ageing* **28 (Suppl 1)**: 33.
21 van Eijk MEC, Avorn J, Porsius AJ and de Boer A (2001) Reducing prescribing of highly anticholinergic antidepressants for elderly people: randomised trial of group versus individual academic detailing. *British Medical Journal* **322**: 654–7.
22 Shelley M, Croft P, Chapman S and Panten C (1996) Is the ratio of inhaled corticosteroid to bronchodilator a good indicator of the quality of asthma prescribing? Cross-sectional study linking prescribing data to data on admissions. *British Medical Journal* **313**: 1124–6.
23 Avorn J, Chen M and Hartley R (1982) Scientific versus commercial sources of influence on the prescribing behaviour of physicians. *American Journal of Medicine* **73**: 4–8.
24 McDonald CJ (1976) Protocol based computer reminders, the quality of care and the non-perfectibility of man. *New England Journal of Medicine* **295**: 1351–5.
25 Hill-Smith I (1996) Sharing resources to create a district drug formulary: a countywide controlled trial. *British Journal of General Practice* **46**: 271–5.
26 Campbell AJ, Robertson MC, Gardner M, Norton RN and Buchner DM (1999) Psychotropic medication withdrawal and a home based exercise program to prevent falls: a randomised controlled trial. *Journal of the American Geriatrics Society* **47**: 850–3.
27 Dowell JS, Snadden D and Dunbar JA (1995) Changing to generic formulary: How one fundholding practice reduced prescribing costs. *British Medical Journal* **310**: 505–8.
28 Wilson RPH, Buchan I and Walley T (1995) Alterations in prescribing by general practitioner fund holders: an observational study. *British Medical Journal* **311**: 1347–50.

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