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DOI: 10.1093/ageing/afh005

Prescribing indicators

SIR—The multi-centre audit on prescribing indicators by G. M. Batty *et al.* [1], in which we were pleased to participate, has highlighted sub-optimal prescribing in elderly medical in-patients. We have since completed three audit cycles and have presented the findings across the hospital to most potential prescribers. The information on appropriate prescribing has also been added to the senior house officer induction pack in our department.

By repeating the audits and disseminating the prescribing indicators to medical staff, we have partially succeeded in improving the outcome. There has been significant improvement with figures approaching 90% in the documentation of allergies, avoidance of paracetamol toxicity, long-acting oral hypoglycemic, appropriate use of aspirin or clopidogrel in angina and aspirin or warfarin in atrial fibrillation. Other indicators have largely remained unchanged.

In our experience junior medical staff has the greatest influence on the prescribing indicators. Through regular re-audits and by involving pharmacists and nurses, we were able to achieve higher standards of quality of prescribing. However, rapid turnover of junior medical staff prevented us from improving the results further.

Batty *et al.* recommends developing further prescribing indicators. In our repeat audits, we audited prescribing of prognostically important medications. These included Angiotensin Converting Enzyme inhibitors, beta-blockers, spironolactone and a combination of hydralazine and nitrate in the management of heart failure. Other indicators were medications for osteoporosis prophylaxis, cyclo-oxygenase II inhibitors and proton pump inhibitors with nonsteroidal anti-inflammatory drugs.

Our experience suggests that an ongoing programme of prescribing audits may prove to be an effective measure in improving prescribing in elderly inpatients.

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1. Batty GM, Grant RL, Aggarwal R *et al.* Using prescribing indicators to measure the quality of prescribing to elderly medical in-patients. *Age Ageing* 2003; 32: 292–8.

DOI: 10.1093/ageing/afh022

Frailty is the main predictor of falls in elderly patients undergoing rehabilitation training

SIR—We read with interest the article by Vassallo and colleagues, recently published in *Age and Ageing* [1]. The authors found that elderly fallers can be predicted by easily identifiable characteristics, such as confusion, history of previous falls and unsafe gait. We want to contribute with personal data to this topic, suggesting that frailty is the main determinant of falls among elderly patients undergoing rehabilitation training.

From 1 January 2001 to 30 April 2003, a total number of 649 patients were admitted to our 25-bed Rehabilitation Unit. Of these, 271 (41.8%) were admitted because of a recent orthopedic intervention (lower limb fractures, elective hip or knee replacement, shoulder replacement), 32 (4.9%) because of recent cerebrovascular attacks (stroke, TIA lasting less than 6 months), 195 (30.1%) because of chronic neurological-related gait disorders (Parkinson disease or parkinsonisms), 77 (11.9%) because of arthritis-related gait disorders and 74 (11.3%) for cardiac or pulmonary rehabilitation. Forty-six patients (7.1%) fell once or more during their hospital stay. The table shows that, in comparison with the other patients, fallers were more impaired in functional status 1 month before admission and had a lower functional recovery in gait and balance (Tinetti score) at discharge, although they remained in hospital on average 5 days more than non fallers.

When we tested the effect of these variables on predicting falls in a logistic stepwise regression model, we found that only functional status 1 month before admission (Barthel Index $\leq 80/100$; B = 0.90, 95% CI = 1.0–6.0, Odds Ratio = 2.5, $P = 0.04$) significantly and independently predicted falls in our population.

Because the functional status preceding the event that leads to hospital admission reflects the pre-morbid health conditions of the patient, a low Barthel Index score one month before admission could be considered a marker of frailty. Therefore, the assessment of functional status before admission could be helpfully used to recognise frail patients at risk of falls during hospital stay.

Table 1. Clinical characteristics of fallers and non fallers patients ($n=649$) consecutively and firstly admitted to a Rehabilitation Unit

	Non fallers ($n=603$)	Fallers ($n=46$)	P^*
	Mean \pm SD or n (%)	Mean \pm SD or n (%)	
Age	78.1 \pm 7.4	79.2 \pm 6.2	0.33
Gender(female)	458 (75.8)	35 (76.1)	0.56
BMI (kg/cm ²)	25.0 \pm 5.1	24.8 \pm 3.6	0.83
Charlson Index	2.4 \pm 2.2	2.7 \pm 1.8	0.41
Drugs on admission	5.0 \pm 2.2	5.5 \pm 2.5	0.17
Albumin serum levels (g/dl)	3.2 \pm 0.5	3.3 \pm 0.4	0.07
C-Reactive protein serum levels (mg/dl)	3.2 \pm 4.9	2.2 \pm 3.7	0.24
Mini Mental State Examination (0–30)	22.9 \pm 6.2	22.6 \pm 6.4	0.76
Barthel Index pre- admission (0–100)**	86.5 \pm 21.2	78.5 \pm 27.6	0.03
Barthel Index on admission (0–100)	60.5 \pm 28.3	51.8 \pm 30.3	0.07
Tinetti score on admission (0–28)	12.7 \pm 8.8	11.7 \pm 8.1	0.45
Difference in Barthel Index from admission to discharge	19.6 \pm 19.2	20.7 \pm 20.9	0.75
Difference in Tinetti score from admission to discharge	7.2 \pm 6.7	4.7 \pm 7.4	0.02
Instrumental Activities of Daily Living (functions lost)	2.4 \pm 1.8	2.9 \pm 1.6	0.06
Handgrip strength (Kn)	10.4 \pm 9.1	7.4 \pm 6.2	0.14
Length of stay (days)	20.3 \pm 8.8	25.0 \pm 9.5	0.001

*Significance on t -test or chi-square.

**Barthel Index detecting the functional status 1 month before admission.

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Using prescribing indicators to measure the quality of prescribing to elderly medical in-patients

SIR—Batty *et al.* have recently reported on the quality of prescribing using a wide range of performance indicators [1]. Their inclusion of indicators that measure under-prescribing as well is welcome. However, as with all performance indicators, one should be cautious in assuming that these indicators are not without their own deficiencies. I illustrate just two problems with reference to the use of anti-thrombotic stroke prophylaxis in atrial fibrillation, for which the prescription of either warfarin or aspirin 300 mg was regarded as appropriate. First, the group studied, elderly medical in-patients, must have included a significant proportion of patients who were in the last few months of life. I am not aware that for this group, there is proven evidence of benefit. Their criteria of 'death of patient imminent' [2] is too restrictive. An interesting recent approach to health promotion activities has suggested that older people could be classified into four groups: robust elderly life expectancy ≥ 5 years; frail, life expectancy > 5 years; moderately demented, life expectancy 2–5 years and end of life, life expectancy < 2 years [3]. This classification has the advantage of relative simplicity and may be a useful way of dividing older patients into groups for which prescribing an antithrombotic for atrial fibrillation may or may not be appropriate. Secondly, these indicators do not take any account of the patient's view of whether the benefit is real or not and therefore whether in their judgement it is worthwhile taking the medication. We have all had experience of patients, who knowing all the information, choose not to take medical advice and refuse prescriptions. For such patients prescribing is clearly inappropriate. However, detecting that this is the case through audit will require examination of the medical records rather than just the prescription chart. It is hoped that further refinements of the prescribing indicators may take these points into account.

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