Take Ten Minutes: A dedicated ten minute medication review reduces polypharmacy in the elderly

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Abstract
Multiple and inappropriate medications are often the cause for poor health status in the elderly. Medication reviews can improve prescribing. This study aimed to determine if a ten minute medication review by a general practitioner could reduce polypharmacy and inappropriate prescribing in elderly patients. A prospective, randomised study was conducted. Patients over the age of 65 years (n=50) underwent a 10-minute medication review. Inappropriate medications, dosage errors, and discrepancies between prescribed versus actual medication being consumed were recorded. A questionnaire to assess satisfaction was completed following review. The mean number of medications taken by patients was reduced (p<0.001). A medication was stopped in 35(70%) patients. Inappropriate medications were detected in 27(54%) patients and reduced (p<0.001). Dose errors were detected in 16(32%). A high level of patient satisfaction was reported. A ten minute medication review reduces polypharmacy, improves prescribing and is associated with high levels of patient satisfaction.

Introduction
The elderly population in Ireland is currently increasing resulting in a large number of community dwelling elderly patients. In fact, patients of 65 years of age and over account for greater than one third of patients registered with an individual General Practitioner (GP). Altered drug metabolism increases potential for toxicity. Elderly patients are more likely to have multiple comorbidities and to have more than one physician involved in their care. These factors, combined with the increasing availability of new medications may lead to polypharmacy and inappropriate prescribing. Definitions of polypharmacy include the use of 6 or more medications and also the use of a potentially inappropriate medication. Inappropriate prescribing includes not only the prescribing of inappropriate medication but also the absence of prescribing a medication for which there is a valid indication.

Recent studies suggest that high rates of polypharmacy exist among elderly patients in the community. Also, there is evidence that many medications prescribed among community dwelling elderly patients are inappropriate. These factors may increase the risk of adverse drug reactions, falls and non-compliance, which if not resolved in their early stages, may result in a decreased health status in the elderly. Medication reviews can improve prescribing. This study aimed to determine if a ten minute medication review by a general practitioner could reduce polypharmacy and inappropriate prescribing in elderly patients. A prospective, randomised study was conducted. Patients over the age of 65 (n=50) underwent a 10-minute medication review. Inappropriate medications, dosage errors, and discrepancies between prescribed versus actual medication being consumed were recorded. A questionnaire to assess satisfaction was completed following review. The mean number of medications taken by patients was reduced (p<0.001). A medication was stopped in 35(70%) patients. Inappropriate medications were detected in 27(54%) patients and reduced (p<0.001). Dose errors were detected in 16(32%). A high level of patient satisfaction was reported. A ten minute medication review reduces polypharmacy, improves prescribing and is associated with high levels of patient satisfaction.

Methods
We conducted a prospective randomised study at a single urban General Practice in the South East. Full ethical approval was obtained from the ethics committee of the Irish College of General Practitioners. Patients of 65 years and over receiving repeat prescriptions for two or more medications and living at home were included in the study. Using an electronic database, a list of eligible patients was generated (a total of 365 patients) and a sample size of 50 or greater was calculated to give adequate statistical power. 56 patients were selected using a table of random numbers. Telephone contact was made with each patient, inviting them to attend for review. Five declined and three could not be contacted resulting in a study sample of fifty patients. Informed consent was obtained.

Tools are available to assess the appropriateness of prescribing in elderly patients. Such tools include Beers criteria independent of diagnosis (ID) and considering diagnosis (CD), Inappropriate Prescribing in the Elderly Tool (IPET) and Screening Tool of Older Persons (STOPP/START).

Prescribing in this group of patients offers unique challenges to the GP. Altered drug metabolism increases potential for toxicity. Elderly patients are more likely to have multiple comorbidities and to have more than one physician involved in their care. These factors, combined with the increasing availability of new medications may lead to polypharmacy and inappropriate prescribing. Definitions of polypharmacy include the use of 6 or more medications and also the use of a potentially inappropriate medication. Inappropriate prescribing includes not only the prescribing of inappropriate medication but also the absence of prescribing a medication for which there is a valid indication.

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During the review the total number of medications actually taken by the patient was recorded as was the total number of medications appearing on the patient's computerised record. Medications not being taken by the patient were removed from the active/current medication list but remained on record in their file. Medications available as combination preparations were substituted. Errors in dose and medications thought to be inappropriate in view of age, diagnosis or other medications taken were identified. Incorrect doses were altered and inappropriate medications were stopped or altered. Patients were asked regarding non-prescription or over the counter (OTC) medications. A record of OTC medications was established for each patient separate from their medication record. Patients were informed that all OTC preparations had the potential to interact with prescribed medication and were advised to only take prescribed medication and to discuss the use of such preparations with their primary physician. Errors in dose were identified using the British National Formulary 2007 edition. Inappropriate medications were identified using the British National Formulary 2007 edition and the Improved Prescribing in the Elderly Tool (iPET) 12.

Relevant investigations, prior to and following a change in medication, were arranged on an individual case basis. A follow up appointment was arranged with the patients usual GP following any change to medication and any changes were discussed with the relevant GP. Four weeks following review telephone contact was made with the participants and a questionnaire to assess satisfaction was completed. Data was analysed using linear regression and paired t-tests. The statistical package used was SAS Version 9.1.

Results
Fifty patients underwent medication review (F=28, M=22, Age range 65-86, mean age 73). The study found a reduction in the mean number of overall medications taken by patients following the medication review. In addition there was a reduction in the numbers of inappropriate medications taken and errors in dose of medications. The number of medications appearing on the patients records was also reduced. The main findings are listed in Table 1. All of the findings were statistically significant. No association was found between any of the findings and age, sex and the time since the patients' last consultation as listed in Table 2.

A medication was stopped in 70% of patients, an inappropriate medication was detected in 54% and an error in dose was detected in 32%. In the case of 16% of patients taking 2 separate antihypertensive agents that were available as combination preparations of the same agent and dose, the combination preparation was substituted. Table 3 illustrates the frequency of inappropriate prescribing identified for the IPET criteria. Alternative agents were substituted as appropriate for IPET errors identified. In patients using NSAIDs for the long term treatment of OA paracetamol or paracetamol and codeine preparations were substituted. In patients with asthma or COPD taking B Blockers for hypertension an alternative antihypertensive agent was substituted. In patients taking long term benzodiazepines for night sedation an alternative agent for night sedation was prescribed. 92% of patients records prior to review contained medications not currently taken by the patient and 56% of the study sample were taking over the counter medications. The medication review was associated with a high level of patient satisfaction. Table 4 lists the areas which the questionnaire to assess satisfaction addressed.

Discussion
Our study demonstrates that a ten minute medication review can significantly reduce polypharmacy in elderly patients. Furthermore, the review can identify and reduce inappropriate prescribing and prescribing error. A total of 68% of patients had some change made to their medication with 70% of patients requiring cessation of at least one medication and 32% of patients having an error in dose corrected. Previously published work has shown similar findings to those in our study with recent larger studies in Ireland supporting the finding of a high prevalence of inappropriate prescribing 13-15. However, our study also looked at the association between inappropriate prescribing and polypharmacy and the length of time since the patient was last seen. This has not been looked at previously and the findings of our study suggest that regular attendance is not currently reducing polypharmacy or inappropriate prescribing. This supports the dedication of time specifically to review medication in this population.

The study also shows that medication review can improve accuracy of patients records. 92% of the records contained medications that patients
were not actually taking and 56% of patients were consuming non-prescription or OTC medications. In all cases the computerized record was inaccurate where medications had not been removed from the current or active medication list following their cessation. These findings support previous work that medication records may be inaccurate and that doctors are often unaware of what medications their patients are actually taking. 12,17 Regular updating and review may improve the quality of GP held medication records. Improving accuracy may increase the safety of repeat prescribing in the vulnerable elderly population and may also enhance communication with secondary care providers. In addition the study demonstrates that medication review is acceptable to patients as an intervention. 96% of patients stated that they would like a repeat review with none having experienced distress as a result of the intervention and the majority feeling they had benefited from the review. Previous studies have not looked at patient satisfaction as an outcome.

Finally the study demonstrates the feasibility of reviewing medication within a ten minute consultation. The review of prescribed medication during a routine consultation has previously been described 8,10, Other studies however have not looked at the feasibility of actually conducting a dedicated medication review within a ten minute timeframe. The finding suggests that it may be feasible for a GP to review the medications of all elderly patients on a regular basis. Based on figures from the HSE South East region in which the study was conducted approximately 200 of the patients registered with a given GP are sixty five years and over. To conduct a six monthly medication review, as would be the preference of the patients in this study would involve a time commitment of 8 ten minute consultations per week. To review medication on an annual basis would require the dedication of just 4 consultations per week.

The limitations of this study include the small number of patients and the involvement of a single centre. In light of the random selection of elderly community dwelling patients it is thought that the findings are likely to be generalizable to this population in general practice but larger population studies in this area are required. A further limitation of the study is the conduction of the satisfaction survey after the medication review and by the principal investigator resulting in a possible social desirability bias. We also acknowledge that IPET has limitations as a screening tool for inappropriate medications. Firstly it suggests the use of B Blockers in heart failure is inappropriate and secondly it does not address untreated conditions. IPET is however a simple tool to use in general practice and is suitable for use within the ten minute consultation.

It has been shown that a population-based approach to medication reviews in elderly people is both feasible and effective. A programme of medication review has been endorsed by the government in Australia and general practitioners and pharmacists are now reimbursed for the provision of this service 10. It may be possible for a similar strategy to be introduced in Ireland. A dedicated, 10-minute medication review by a GP significantly reduces polypharmacy and improves prescribing in the elderly, at-risk population. It is associated with a high level of patient satisfaction and appears to be feasible to conduct regularly in the general practice setting.

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