

Measuring the impact of medication review in care homes with nursing facilities

Abstract

Objective: To evaluate the impact of performing a clinical medication review by a pharmacist for residents of all care homes with nursing in South Birmingham PCT.

Design: A clinical pharmacist visited each GP practice to take a detailed report for each patient and then compared this with what was being administered in the home. After discussing any issues that arose with the staff or residents in the home a report was compiled for the GP and a meeting set up to discuss which of the suggested changes may be implemented. The pharmacist implemented the changes and printed off medication lists for the home. An amended report and medication lists were given to the home.

Participants: Care home with nursing residents.

Main Outcome Measures: Cost savings, reduction in waste of medicines and clinical interventions

Findings: There were 881 residents reviewed and £118,539 savings identified. There is clearly avoidable waste of medicines in all care homes but the staff in homes who are best able to reduce this are not responsible for the medicines budget. GPs are not always aware of all the waste that occurs. Good communication across all groups of staff is essential.

Conclusion: It is cost-effective and improves quality of prescribing to employ a clinical pharmacist to perform medication reviews in care homes with nursing. The natural extension of this work would be to expand reviews into other areas, such as care homes without nursing and to domiciliary medication reviews in the housebound.

Introduction

Pharmacist-led medication review has been shown to be effective in the elderly and to produce moderate cost savings with additional quality improvements.¹⁻⁴ Many studies performing medication reviews exclude patients in care homes.^{1,3} One recent review of a pharmacist conducted clinical medication review in 315 residents of care homes matched to 331 similar residents who received standard care has demonstrated a beneficial effect on falls prevention without change in drug costs, hospitalisation, mortality or standardised cognitive and physical functioning as assessed by two standard scoring mechanisms.⁴ This study intended to recruit 1,600 patients and so their well-designed study may have had too few recruits to detect some of the expected differences in outcomes.

Annual medication review is remunerated in the GMS contract for all patients but the level of this review varies⁵ probably because of the limited time available to the

General Practitioner (GP). Elderly care home with nursing residents receive up to four times as many prescription items as those living in their own homes.⁶ It is now common for some care home patients to have more than 10 medications prescribed regularly⁶ and with new advances in medication, medicines regimens are becoming more complex. Medication reviews of elderly patients with complex medicines regimens should be of benefit both in terms of interventions that improve patient care and in terms of financial savings made.^{2,3} The aim of the project was to evaluate whether such benefits could be realised in care home with nursing residents in South Birmingham PCT (SBPCT).

Methods

A clinical pharmacist carried out either a level 2 medicines review (with access to the patients notes) or level 3 review of medicines and clinical condition (with access to the patients notes and face-to-face review) on all residents of care homes with nursing.

Any suggested interventions were noted.

Consent

The clinical pharmacist wrote to each GP within SBPCT to request written consent to access information about their patients for the purpose of undertaking medication review. The local prescribing committee considered whether consent to undergo a medicines review ought to be obtained from residents. They concluded that this was not necessary because it was within the pharmacist's normal duties and was being done in collaboration with residents' GPs.

Nursing staff and GPs helped identify residents who had previously discussed prescribing changes with their GP, a nurse or pharmacist. For these residents a face-to-face discussion was usually undertaken with the pharmacist. The pharmacist obtained written consent from the home manager to review the medicines administration record (MAR) sheets kept in the home and, where necessary, to check observations relevant to medicines in the nursing notes with nursing staff.

Developing a system for medication review using available information

The pharmacist visited each GP practice to obtain information about the care home patients on (a) patient problems and operations, (b) current and past history for their medical conditions, (c) current medication, (d) allergies/sensitivities, (e) vaccinations and (f) test results from the last year.

The pharmacist then visited the care home and compared the MAR sheets in the home with the documented medical records. The pharmacist confirmed pertinent medicines observations with nursing staff. For example, when residents were taking medicines to lower blood pressure

(BP) the latest BP would be requested, for patients taking sip feeds recent weights and their height (or BMI) would be requested. The pharmacist then compared the medical record with what was known to have been taken by the resident in the home. The nursing staff appeared to view the pharmacist's visits as a useful way to discuss problems about medicines in the home.

Developing a reporting format

After visiting the home and making notes on each resident's medicines a report was compiled for the GP documenting both general issues (which might apply to several residents or the whole home) and the specific issues relating to each patient.

Clinical interventions were categorised according to a recommended protocol from the published literature.⁷ This allows the various clinical interventions to be categorised according to eight types. The intervention codes used were: stop; start; counsel; dose/form/frequency adjusted; new; test; technical and medical referral. In addition, the intervention of starting vitamin D with or without calcium was collected as a separate category because it was a very common intervention with major potential benefits for patients.

The report included an estimate of the savings on medication expenditure that could be achieved through stopping medication or reducing quantities, based on the latest on-line drug tariff or, if not listed (generally for branded products), in *MIMS*. Savings were identified only for medicines prescribed on a regular repeat. If a medicine was prescribed acutely no savings were generated from stopping the medicine. Where a medicine was collected by the home in the previous month, savings were estimated by multiplying the monthly cost by 13 to estimate the annual saving for that resident. (All care homes locally use a 28-day cycle so there are 13 cycles in a year). Where a medicine had not been collected in the previous month and it was stopped, the savings were assumed to be zero. Overall savings quoted in this paper include the extra expenditure of new drugs that were started, where applicable.

GP meeting

A meeting was arranged with the GP — usually for about an hour — to discuss the content of the report. At this meeting it was agreed which of the suggested changes may be implemented by the pharmacist.

Implementation of changes

The GP's computer patient medication records were updated by the pharmacist and a consultation was added for each patient reviewed. If requested, medications were linked to the appropriate diagnosis and a repeat review date was set. Some GPs asked me to re-authorise all medicines for a further six repeats or to do bulk additions of calciferol injection for all patients and to liaise with the practice nurse to ensure that these were given at the appropriate time. At this time the repeat medication lists (right hand side of each prescription) was printed out for the home.

An amended report documenting just those changes, which were agreed by the GP and that had been implemented with a copy of the repeat medication lists was generated. This was then sent to the home to enable them to follow through the changes and refer to this when next ordering repeat medicines. Any outstanding GP actions not yet completed were written into a shorter report, which was circulated to the GP for action. Examples include if patients needed a review of their depression or dementia, or if they needed a mini-mental score re-checked or referral to a specialist.

Results

Patient reviews and clinical interventions

There are 980 beds in 23 homes in SBPCT. Since completing this review one nursing home has closed.

During a 20-month period 881 residents (90%) were reviewed by the pharmacist. The remaining 10% comprised either unoccupied beds, residents who had died during the review, or single residents who were managed by their own GP where a review of the MAR chart did not suggest obvious pharmaceutical issues and so the extra time invested to review their notes could not be justified.

There were a large number of clinical interventions, averaging four per resident. The clinical type and mean number of interventions per resident varied widely between GPs (range 2.7–7.7). Areas where interventions were usually possible are summarised in Table 1.^{8–19}

Stopping medication

Many medicines were stopped — sometimes because it was impossible to establish the reason why the medicine was first started! This included aspirin for dementia (which is not effective) and vitamins, which had been started for alcohol use or for wound healing after the condition had resolved. Other medication that was continued after the problem had resolved included treatment for anaemia after a patient had normal blood test results, and proton pump inhibitor use after an ulcer had healed. One patient who had been started on drugs for angina, when investigated did not have ischaemic heart disease, but the medication for this was accidentally never stopped.

Sip feeds may be continued in the long-term despite adequate weights being achieved, but they are expensive. It is important to ensure that part-used cartons are not discarded, and the resident is encouraged to continue to sip them in between meals. Timing of administration of sip feeds can be the key to whether or not the resident gains weight. They should not be used as a substitute for giving high calorie food and snacks — just as an adjunct.

NICE guidelines on dementia discuss the difficult issue of quieting down restless and aggressive residents — some of whom may need short-term antipsychotic medication, but who can have disabling side-effects from them (such as falls, strokes, dyskinesias).¹⁶ The elderly are especially sensitive to antipsychotic medication and in some cases there are no relatives to act as their advocate or to request a review. This can result in a prescription that was intended to be short term being continued. Hypnotic medication rarely works in the longer term and all patients taking these drugs for more than a few weeks should be reviewed.

Table 1. Examples of areas where clinical interventions were made

Reducing falls: All housebound residents should be offered calcium and vitamin D (minimum vitamin D 800 units daily with calcium)⁸ or if unable to take these large tablets calciferol 300,000 units I.M. annually.⁹ Review medication in known fallers.^{4,10} Falls are a major cause of disability and the leading cause of mortality due to injury in people aged over 75 years in the UK.¹⁰ They commonly precipitate admission to long-term care.¹⁰

Reducing waste: Ensure quantities are appropriate for 28 days to minimise waste, carry forward as required medication and emollient creams at the end of each cycle and document this on the new MAR chart. Commission for Social Care and Inspection, who inspect and regulate the homes, agree to the carrying forward of this type of medication for 3 cycles. Ensure that dressings are the appropriate size for the wound and that documentation is adequate so that dressings are not needlessly removed just to allow the wound to be re-assessed. Only use syrups or dispersible tablets where absolutely necessary — consider shaped preparations instead of soluble paracetamol, which is high in sodium, and reassess stroke patients' need for syrups regularly. Use one eyedrop bottle for both eyes, providing they are not infected.

Using the most cost-effective choices of medication: Switch to cost-effective medication where clinically appropriate, such as using simvastatin as first choice of statin. Avoid the use of pharmaceutical specials where an alternative exists. Use the cheapest appropriate form, such as paracetamol caplets rather than soluble. Give the minimum number of tablets to deliver the required dose, such as losartan 50mg 2 daily changed to 100mg 1 daily.

Ensure timing of medications is appropriate: Calcium and vitamin D not given at the same time as alendronic acid. Statins given at night.

Continence: Using disposable night bags without taps, cost-effective formulary choice leg bags and catheters. Prescribe in small quantities to avoid waste. Review use of oxybutynin and similar medicines for catheterised patients (these can usually be stopped).

Stopping and reducing doses of medicines: Step the dose of proton pump inhibitors down once the treatment period is over.¹¹ Ensure patients are appropriately monitored and reviewed, for example, if taking sip feeds this is an adjunct to offering high calorie food that the resident likes.¹² Weights should be monitored weekly and the sip feeds can be stopped in residents who have achieved their target weight. Also, if anaemia resolves stop iron and folic acid¹³ and stop vitamin supplements when taken without a clear indication. There is evidence to suggest that a number of medicines are over-used in residents of care homes in order to calm the resident or to prevent them from 'wandering'. These include antipsychotic medication and hypnotics.^{14,15} The overuse of these medicines have effects on the mental health of residents and may pre-dispose to falls.⁴ The Committee on Safety of Medicines as quoted in the recent NICE guidelines for dementia¹⁶ stress that these drugs should only be used in the short term and at low doses, so review of these patients and stopping the neuroleptic drugs should be a priority to prevent the known side effects of these medicines, all of which are more common in the elderly.¹⁰

Safety issues: Give gastroprotection with a PPI for all residents aged more than 65 years who are taking low dose aspirin with other risk factors for bleeds.¹⁷

Get hypnotic drugs changed to 'as required' use or stopped, since none are licensed for use beyond 4 weeks.¹⁸ Ask nurses to check for postural hypotension in patients who fall.

Ensure glyceryl trinitrate (GTN) is available to patients with a history of angina.

*Ensuring tests are taken at appropriate intervals to monitor drug effects:*¹⁹ Conduct U & Es annually if taking angiotensin converting enzyme inhibitors or diuretics. Conduct FBC every three months if taking sulphasalazine, annually if taking iron or folic acid. Conduct annual TFTs if taking thyroxine. Annual cholesterol test if taking a statin or has CHD.

Spreading good practices in homes: Monitor and regularly reassess pain. Use a catheter chart. Order medicines appropriately. React appropriately if fridges outside 2–8 degrees C. Document using an 'irregularly used' pm chart that covers more than one month for infrequently used medicines such as hydroxocobalamin or migraine treatments.

Developing policies: Some policies have been highlighted by our local community pharmacists visits as being of poor quality and so I have developed policies, which can be adapted for individual homes. These include homely remedies, self-medication and fridge temperature monitoring with actions to be taken if outside 2–8 degrees C.

Education of staff: By building a relationship with staff there can be opportunities to help with problems relating to medicines before they become bigger problems. Offer formal teaching sessions about medication administration.

Switching drugs

Some switches were advocated to release cost savings in accordance with local policy that has reviewed the clinical evidence. For example, rosuvastatin and atorvastatin are usually switched to simvastatin unless there has been a problem tolerating simvastatin in the resident's past history or unless they

are in a special category excluded from switching outlined in our local guideline. Other switches might occur because side-effects have arisen, such as amitriptyline causing problems with urinary retention and constipation, which was switched to a selective serotonin reuptake inhibitor, such as fluoxetine or citalopram. Finally, some

switches were advocated to reduce the number of tablets the resident needed to take, such as changing nifedipine capsules to a longer-acting formulation taken once daily or changing metoprolol to a once daily beta-blocker.

Counsel

This involved talking to the nursing staff or resident about the medication. It included interventions to ensure alendronate was taken with a full glass of water on an empty stomach and not at the same time as the calcium and vitamin D tablet.

The number of interventions in this category was low. This was probably because they did not involve the doctor and so were not documented as systematically as the interventions that were discussed with GPs first.

Altered form or dose

Pharmacists are extremely well placed to know the available formulations of all medicines. This is an area that pharmacists would expect to be more knowledgeable about than GPs who regularly write prescriptions but may not always see the tablets.

In this category patients were changed over from dispersible (high sodium) paracetamol and analgesics to the shaped caplets to reduce the amount of sodium given in the tablets — and the potential associated risks in this population of hypertension and fluid retention.

Where pharmaceutical specials with a short shelf-life were being bought in at high cost suggestions were occasionally made to dissolve the tablets in water instead. Both of these interventions result in an unlicensed medication being given and staff must be aware of their professional liabilities.

One resident, who had previously had a stroke affecting his swallowing had improved enough to be able to be changed back from syrups to tablets. This intervention was at the suggestion of the nursing staff. More often, however, residents who were struggling to swallow tablets were changed

to formulations that were easier to swallow, such as melts or commercially available liquid formulations.

Newly started medication

Some medication was missing and needed to be started. This included:

- calcium/Vitamin D for falls prevention
- offering gastroprotection with a proton pump inhibitor to all residents aged 65 years or more with concurrent comorbidities while taking aspirin
- starting statins or aspirin for secondary prevention of coronary heart disease.

Tests

In some practices there were robust systems of follow-up to ensure recommended blood tests were done routinely, in others the systems were less well developed.

Technical

Clarifying the reason why a medication was prescribed sometimes started out as a 'technical' intervention, but became a reason for stopping the drug. Many of the technical interventions saved money through reducing waste. Examples include:

- encouraging using small packs of creams. Cavilon, for example, used in 28g rather than 92g packs should be adequate for one month and will minimise the amount discarded each month
- for non-infective conditions, eyedrops from a single bottle can be used for both eyes and this saves money. Some care home staff like the availability of compliance aids to prevent missing the eye — some of these are available on FP10, such as Opticare or Autodrop
- adding directions — this encourages staff to use items as the prescriber intended
- making medicines last exactly 28 days and reducing quantities on prn medication — both aim to reduce waste
- stopping medication that is no longer needed and so it does not appear on the repeat slip will prevent ordering it by accident, and reduce waste (although it is not possible to quantify this type of saving without having a control group).

GP referral

GP referral occurred when a problem was difficult and required medical expertise or specialist referrals. These referrals were rare and examples are shown in Table 2.

Teaching

During care home with nursing review visits I discovered that for some nurses their medicines knowledge would benefit from updating. I now offer formal teaching sessions to nursing staff and to carers about medicines every 1–2 months. These sessions evaluate very well.

Medicines wastage

Care homes with nursing in England and Wales are responsible for organising the destruction of their own waste medicines. Despite this, because medicines are re-ordered on a 28-day repeat prescription, a culture has developed in which all that is unused at the end of the month is discarded. Often, partly used 'as required' medication is discarded at the end of the cycle and then re-ordered, only to be discarded again at the end of the next cycle. The GPs appeared to be unaware of this, quite naturally, imagining that medication was being used up before being re-ordered.

Savings

Savings calculated from interventions made during the first medicines reviews were £118,539. This was achieved through stopping medication, with the GPs' agreement, and reducing the quantity of medicine that was ordered.

This saving amounts to an average of £135 per resident, although individual savings per patient varied widely between homes. This ranged from a mean of £10 to more than £550 per resident.

Discussion

Care home residents tend to be frail, have complex needs and take multiple medicines. This makes it difficult for GPs to review these residents within the usual consulting time of approximately 10 minutes.²⁰ This is compounded by the fact that because of the domiciliary nature of care home visits it is unusual for a GP to have remote access to

the computerised records held in GP surgeries, which results in an inability to access the resident's full computerised records at the consultation. Most GPs use paper notes in the care home and some transcribe these to the computerised system later. Those that have the technology to use their computers in the care home often find that remote connections are unreliable.

More robust IT systems external to the surgery would be expected to improve this and it is hoped that the national electronic prescribing initiatives will address this issue.

There appears to be both financial and clinical value in providing extra clinical pharmacy support for our patients in care homes with nursing. A clinical pharmacist can support the GP by suggesting medication changes, which may improve the quality of life for the resident. The findings from this preliminary study suggest that a standard way of grouping interventions is

Table 2. Referrals to GPs

Category	Explanation	%*
Stop	Indication not valid, nonadherence or ADR	11%
Switch	Contraindication, ADR, interaction, cheaper alternative or allergy	10%
Counsel	Counsel, but no drug change	0.9%
Altered form or dose	Regular to prn, dispersible tablets to shaped, altered timing of administration, syrups introduced	13.0%
New	Start drug for untreated indication	9.0%
Vitamin D	Start vitamin D with or without calcium	21.0%
Test	Includes: BP, U&Es, FBC, weight,	9.0%
Technical	Generic switch, altering quantities, deleting unused and duplicated medicines, adding directions, clarifying indications	25%
GP referral	Where insufficient information to make a recommendation, new diagnosis suspected, complex medical condition or worsening condition requiring medical assessment	1.3%

* % is rounded to nearest value unless <2%

Original research

useful and facilitates evaluation of the impact of the clinical interventions.

Residents entering care homes with nursing often change their GP when they move into the home. The resident's notes usually lag behind their admission leaving the new GP with a period in which they do not have the resident's full medical history. This can mean that the impetus to review new residents' medicines at the time of transfer is lost and so a subsequent review by a clinical pharmacist can be helpful.

Care home patients are regularly admitted to hospital, averaging about one admission for every two residents per year in SBPCT. Therefore, transfer of care considerations are particularly important.²¹ Simple things such as sending a summary or a photocopy of the MAR chart with the patient to hospital can help the admitting hospital nurse, pharmacist and doctor to know what medication the patient takes. This is a good practice recommendation that is easy to do and usually adopted by our care homes.

There are a number of specific issues around waste, caused by the cyclical ordering of medicines. These need to be tackled to ensure we offer best value for money within the NHS. Home staff and their residents are not directly accountable for their medication budgets and have no easy way to know how much the discarded medication costs. GPs may be unaware of some of the waste that occurs, despite the fact that budgetary responsibility rests with them. For example, they often are unaware that supplies of 'as required' medicines are commonly discarded and then re-ordered.

Zermansky and colleagues have shown that a clinical pharmacy medication review can have an impact on reducing falls in this vulnerable group of patients.⁴ We did not evaluate this in our elderly population, although stopping both hypnotics and antipsychotic medication would be expected to be of benefit in preventing falls in the short-term, and starting calcium and vitamin D or calciferol in most of the population may be expected to have a long-term benefit.

This evaluation demonstrates that medication reviews of care home with nursing residents by a clinical pharmacist is a cost-effective way of reducing medicines wastage, and pharmacy input can help educate staff to prospectively reduce wastage. There is also added value of an expert evaluation of the use of medicines for each resident, which supports the GPs and helps to ensure the most efficient use of their time.

Future Studies

Having found that medication review of residents in care homes with nursing to be cost-effective in SBPCT a logical projection would be to extend this service to residents of care homes without nursing.

Another area of potential usefulness is in performing medication reviews of patients taking complex medication regimens at home. This might yield benefits in terms of improving concordance with medicines, helping patients understand why the medicines have been prescribed, rationalising the number and

appropriateness of each long-term medicine through regular review. If it is possible to reduce falls in this group this might also keep patients at home for longer, which has both social and economic benefits.¹⁰ Community pharmacists could target patients taking long-term hypnotics for MUR, and using the excellent good sleep guide,²² educate and support patients to reduce hypnotics use, thereby reducing the risk of falls.

Medication review needs to be repeated at regular intervals.¹⁰ It will be interesting to discover if the savings achieved in our first review are reproduced in subsequent reviews in the care homes. ❀

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