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Medicines management support to older people: understanding the context of systems failure

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ABSTRACT

Objectives: Changing demographics and pressures on the healthcare system mean that more older people with complex medical problems need to be supported in primary and community care settings. The challenge of managing medicines effectively in frail elderly patients is considerable. Our research investigates what can go wrong and why, and seeks insight into the context that might set the scene for system failure.

Setting: North London; a district general hospital and surrounding health authorities.

Participants: 7 patients who had been admitted to hospital and 16 informants involved in their care.

Design: Patients with preventable medication-related admissions were identified in an occurrence screening study. An accident investigation approach was used to create case studies from accounts of staff involved in each patient's care prior to their admission. Structured analysis of case studies according to the accident investigation approach was complemented by a separate analysis of interviews using open coding with constant comparison to identify and illustrate higher-level contextual themes.

Outcomes: The study sheds light on care management problems, their causes and the context in which care management problems and their causes have occurred.

Results: Care management problems were rooted in issues with decision-making, information support and communications among staff members and between staff, patients and carers. Poor judgement, slips and deviations from best practice were attributed to task overload and complexity. Within general practice, at the interface with community services and with hospitals, we identified disruption to traditional intraprofessional and interprofessional roles, assumptions, channels and media of communication which together created conditions that might compromise patient safety.

Conclusions: New ways of working driven by the ethos of productivity are disrupting traditional intraprofessional and interprofessional roles, assumptions, channels and media of communication. Concomitant improvements in communications technology, process and protocol are urgently required to offset potentially serious risks to patient safety.

Strengths and limitations of this study

- The study adopts a systematic approach among a series of older patients with preventable medication-related admissions, includes interviews with a range of healthcare staff and analyses the data using two complementary theoretically robust approaches. We applied *both* systems analysis against an established accident causation model *and* inductive analysis of the same materials embracing sociological perspectives.
- The accident investigation approach is rooted in psychology and engineering, and the investigation framework supports a classificatory approach that highlights how processes and the organisation and management of work can predispose to errors and mistakes among human players in the system.
- The analysis of interviews using the constant comparison method fostered a broader contextual view on how new ways of working driven by the ethos of productivity are disrupting traditional intraprofessional and interprofessional roles, assumptions, channels and media of communication.
- The findings are based on data from 16 interviews relating to 7 patients. The interpretation of the findings may have been influenced by the perspectives of the interviewer and other members of the research team. The relevance of the findings to other settings will depend on judgements drawing on broader research and local knowledge.
- The patient voice is not represented in the narrative generated in this study. While this is consistent with the accident investigation approach used, in-depth patient interviews might have added an extra dimension to the findings that cannot be captured by interviewing staff.

INTRODUCTION

Ten million people in the UK are over 65 years old. By 2050, this figure will have nearly doubled to around 19 million. Within this total, the number of very old people grows even faster. There are currently three million people aged over 80 years and this is projected to reach eight million by 2050.[1] Older adults are more likely to suffer with chronic illness and need to take medicines to maintain health and quality of life. The likelihood of having a long-term condition and associated poly-pharmacy increases steeply with each decade beyond 65 years.

Studies of medication management in older people show that they are: more likely to experience adverse consequences of medication usage; at greater risk of potentially inappropriate prescribing; more likely to be uncertain about physician instructions; more likely to have greater difficulties ordering and collecting their medicines; prone to have difficulties differentiating or administering their medicines because of sensory, cognitive or physical impairment; and they may have lower tolerance of drug side effects or interactions.[2–5] Among older people admitted to hospital, between 3% and 7% are admitted because of medication-related problems. In a review of studies of medication-related admissions the median rate of medication-related admissions was 4.3%, and over half of these were preventable (median preventability fraction of 0.56).[6]

Research into causes of medication problems has tended to focus on identifying and classifying errors in the medication management process. Typically, these will be grouped as associated with prescribing, dispensing and administration.[7 8] The aim of this study was to investigate the things that go wrong, and also how and why they go wrong. Recent years have seen important changes in the theory of organisational accidents. In particular, human factors psychologists emphasise the importance of distinguishing between so-called 'active failures', the acts of omission or commission associated with adverse outcomes, and 'latent failures', such as communication difficulties and management or organisational problems that impact on human performance.[9] As relevant, though, is the broad literature in social sciences on professional judgement, interprofessional working and organisational behaviour that can bring additional theoretical insights into the workings of organisations and the implications for delivery of care.[10] The configuration of primary, community, hospital and pharmacy care in the National Health Service is as much by accident of history as by design, with each sector operating within its own sets of assumptions, incentives, managerial and professional frameworks.[11] In this study we adopted an accident investigation approach to study cases where things have gone wrong. We then applied *both* systems analysis against an accident causation model *and* inductive analysis of the same materials embracing sociological perspectives, with a view to extending our interpretative scope to better understand why things have happened and what might be done to change them.

METHODS

Overview and setting

The research design derives from the critical incident technique adapted to generate data through the investigation of situations where things have gone wrong.[12] The identification of the study population for the research is described in detail elsewhere and comprised all patients with preventable medication-related admissions identified in an occurrence screening study in a district general hospital in north London.[13] A pharmacist based in a medical admissions ward reviewed charts and records of all patients aged 65 years or more. Patients with medication-related problems were then subject to detailed review by a specialist physician and assessment by a multiprofessional panel; patients with preventable medication-related admissions were invited to participate in this study. The investigation of individual cases described in this paper was using a structured accident investigation approach that informed the interview schedule prior to data collection, the original analysis and presentation of the findings.[14] This structured case-based analysis was subsequently complemented by a separate analysis of interviews, using open coding with constant comparison to identify and illustrate higher-level contextual themes.[15]

Data collection

The specialist physician affiliated with the study approached patients during their index admission, and subject to consent ascertained their social situation, including carer support, the rationale for their prescribed medicines, the arrangements for collection of prescriptions, and for dispensing and administration of medications by questioning and from their medical records. The patient's general practitioner (GP) was sent a case synopsis with information about the study when the patient was discharged, then contacted to request an interview. Contact details of staff involved in supporting medicines management were provided during interviews with GPs, and were approached in a similar manner. All interviews followed a standard approach involving ascertaining the chronology of events, eliciting informants' views on why problems with medication management had occurred and then considering whether factors related to staff, tasks, teams, work environment and organisational management might have contributed to the 'care management problem'.[14] All interviews were conducted by a single individual with previous experience of the investigative approach, and supported through scheduled debriefing sessions with SR. Interviews were audiotaped and transcribed, or where recording was not possible (eg, because consent was not given for this) notes were taken and written up immediately. The interviewer also kept a reflexive diary, noting issues and considerations that emerged and adding comments to the subsequent transcripts.

Data analyses

For the original analysis, case reports were prepared using all information available about a particular case. Care management problems were listed and then transcripts were reviewed again to identify possible contributory factors, which were organised against the causal factor classification that informed the structure of the interviews. This work was managed by the interviewer, verified and developed by SR and sent to informants, who were asked to provide feedback on the accuracy of the report and its presentation as a no-blame

anonymous investigation. Finally, the contributory factors documented in each of the case reports were catalogued to support analysis of common causal factors applying across the cases investigated.

All interviews were subsequently reanalysed using an open coding and constant comparison method.[15] Interviews were loaded onto QSR Nudist software to facilitate analysis. Segments of text relating to the emergence of medication-related problems, associated conditions and contexts were coded by SR and revised into a final scheme through multiple iterations and discussion involving the research team, including GM and GR. Relational properties were studied to build explanatory frameworks and searches of text were made to provide evidence for propositions. Explanatory narratives, incorporating negative instances and contradictory findings, were developed to provide insight into the context against which care management problems occurred.

RESULTS

Sixteen patients with preventable medication-related admissions were identified as part of the occurrence screening study among 409 medical admissions aged 65 years or more.[13]

Ten of the 16 patients gave consent for further research to be conducted and provided information on their arrangements for medication management. The GPs agreed to participate in seven cases. Thirteen additional informants were identified by them during the interview process and all agreed to participate, with the exception of one pharmacist.

Nineteen interviews were conducted in total, but two hospital consultants subsequently asked that their interviews and that of a hospital-based specialist nurse who supported one of the consultants be excluded. Consequently, our analysis covers seven cases, based on accounts of 16 informants in primary care settings only, including interviews with seven GPs, four district nurses, one specialist nurse and four pharmacists.

Case studies

The clinical contexts for the seven case studies are summarised in box 1.

Care management problems

Care management problems identified in the case studies are summarised in table 1.

Questionable prescribing decisions and failure to elicit or record information were presented as human errors associated with non-use or misuse of existing systems for information exchange, and often with associated work environment factors that limited time and created interruptions. We also noted examples where hazard warnings presented on clinical systems and understanding of risk could be over-ruled by a pragmatic rationalisation that in retrospect amounted to optimistic bias. Failure to act, inclusive of not following up after medication changes, poor monitoring or delayed assessment, was more often attributed to failures of groups of people, where lack of clarity around tasks, roles and responsibilities of different healthcare professionals had left gaps in care processes. We noted nevertheless that process and infrastructure for supporting required actions was poor. For example, apart from making a note in the patient record, there was no routinised handover process between staff in general practice. Likewise, medication review was prompted on the electronic GP record, but there was no diary function to prompt repeat assessments in other situations. Features of the work environment, principally the pressures on human resources, changes in ways of working to accommodate part time staff and the complexity of case management, were perceived to underpin the risks of compromised information exchange and care planning. Finally, the single case of failure to diagnose was presented as an

Box 1 Clinical details of case studies

Case 133	An 89-year-old woman disabled with rheumatoid arthritis was taking methotrexate. A friend collected her medicines for her and helped open the bottles. She had difficulty getting to the hospital for blood tests and was found to have bone marrow suppression when she became unwell.
Case 139	A 70-year-old man who had had a previous stomach ulcer, prostate cancer and hypertension. He took aspirin bought at the pharmacy to protect his heart. He was prescribed a non-steroidal anti-inflammatory drug and admitted after vomiting blood.
Case 295	A 70-year-old woman with diabetes, chronic obstructive heart disease, angina and hypertension who lived alone. A relative collected her medicines, but the patient often forgot to take them. She was admitted unwell with high-blood sugar.
Case 389	A 93-year-old care home resident with dementia and diabetes. The pharmacy ordered and delivered her medicines and district nurses administered her insulin. A specialist nurse was also involved. The patient was admitted with collapse due to low-blood sugar.
Case 355	An 80-year-old woman with glaucoma, osteoarthritis and a pacemaker for sick sinus syndrome was advised by a cardiologist to take aspirin and clopidogrel. She was already prescribed a non-steroidal anti-inflammatory drug and was admitted with gastrointestinal bleeding.
Case 392	A 93-year-old woman with atrial fibrillation, heart failure and chronic obstructive lung disease was started on new medicines at the hospital. A relative collected her medicines and she had a dossette box to organise her medicines. She became hypothyroid and developed renal failure due to the medicines she was prescribed for heart problems.
Case 394	A 79-year-old woman with diabetes, coronary heart disease, congestive heart failure and hypertension living with her spouse. She decided to stop taking her diuretics due to continence problems and was admitted with worsening heart failure.

Table 1 Care management problems identified in case studies

Questionable prescribing decisions	Case 139 had been recommended daily aspirin for the primary prevention of heart disease, even though he had had a gastric ulcer in the past. Subsequently a general practitioner went on to prescribe a non-steroidal anti-inflammatory drug to the same man, another drug that is contraindicated in people with a history of gastric ulcer. Case 355 was taking a non-steroidal anti-inflammatory drug for joint problems. She attended a hospital outpatient department and was advised to take aspirin and then aspirin and clopidogrel for atrial flutter. The prescription for all three drugs was subsequently issued by the general practitioner
Failure to elicit or record relevant information	Case 139 was taking over-the-counter aspirin for primary prevention of heart disease. This was not recorded in the patient's notes. The general practitioner prescribed a non-steroidal anti-inflammatory drug and did not enquire about use of over-the-counter drugs. The pharmacist indicated that it was usual to check for contraindications when a new drug is dispensed but that the step might be missed. In Case 392, blood tests relevant to the initiation of new drugs were carried out during a hospital admission, but the results were not available at the time of discharge and were never made available to the general practitioner. The same patient returned for a hospital outpatient visit, but the hospital doctor had no information on the drugs the patient was taking and the patient brought no medicines with her
Failure to follow-up after medication changes	In Case 295, the dose of oral hypoglycaemics was changed because of poor blood results. The patient was housebound so medication changes were made on the basis of telephone advice. The district nurse agreed to call to assess the patient's medication use and to monitor progress but there were difficulties around arranging regular visits to the patient and the patient was subsequently admitted to hospital with very high-blood sugar levels. In Case 389, community staff accepted responsibility for administering the patient's insulin. Changes were made to the insulin regimen to optimise diabetic control but the patient collapsed from hypoglycaemia before any blood sugar series was initiated. In Case 394, a series of general practitioners made house calls. There was little information in the records about each of these visits. The practice ran a rotation system but there was no handover requesting a future visit
Failure to monitor a patient prescribed regular medications	In Case 133 there were failures on the part of general practitioner, hospital and district nurses to monitor a patient taking methotrexate. The hospital asked the general practitioner to arrange monitoring in the community. He had sent requests to the district nursing service and called the hospital to ask that monitoring at the clinic be reinstated. The hospital never recalled the patient and the district nurse dropped the patient from the caseload after two blood tests. Case 355 had been taking non-steroidal anti-inflammatory drugs for many years. There was never any review of this prescription. In Case 394, the pharmacist held records for the patient, but these were incomplete and assumed gaps reflected periods when an alternate pharmacist might have been used
Failure to act on abnormal findings	In Case 133, a blood test was taken at an A&E visit (a full blood count in a patient with haemoptysis). The discharge letter noted that this was abnormal (a low haemoglobin and platelet count), but the significance of this was not appreciated at the time. In Case 295, a practice nurse had found a peripheral pulse to be absent when examining the patient's feet and wrote this in the notes. The index admission was with poor diabetic control and the patient was found to have sepsis in the affected foot. In Case 392 a hospital doctor and the general practitioner had failed to act on an abnormal result. The consultant subsequently noted the abnormal result on an outpatient letter but the general practitioner assumed that the hospital would address this through a follow-up appointment. In Case 394 a number of general practitioners had visited the patient's home and adjusted medications to improve control of the patient's heart failure. One of the district nurses was visiting the same patient to help manage continence problems but this was unknown to the general practitioner. It emerged that the patient was not taking her diuretics because of continence problems, but this went unnoticed by the medical team

Continued

Table 1 Continued

Failure to diagnose a problem	Case 389 had fallen at the care home. The staff called the general practitioner for a visit. The staff indicated that the patient fell on her arm, but that the patient was using it normally. The general practitioner was reassured and decided not to visit. The next day the staff rang again to say there was extensive bruising. The general practitioner sent the patient to A&E and a fracture was diagnosed but the background of recurrent bouts of hypoglycaemia was not associated with the fall until there was a further incident resulting in a hospital admission
Delayed response in assessing a patient	In Case 298, delays in assessment centred on the fact that the patient considered herself housebound. The general practitioner left it to the patient's daughter to make arrangements for domiciliary optometry and chiropody which introduced considerable delay. In Case 389, there were delays in responding when a patient suffered hypoglycaemic attacks. The patient lived in a care home and the staff had been taught how to recognise these and what to do. The district nurse and the diabetic specialist nurse were the principal staff supporting this strategy

outcome of a professional judgement that a home visit was unnecessary and without any contributory factors.

Causes of care management problems

A synthesis of causal factors underpinning the care management problems, grouped into the categories in the accident causation model, appears in box 2.

Context of systems failure

In this section we move from descriptions of what went wrong, how and why, towards an understanding of features that might provide insights into the context that has created the latent conditions for the many systems failures described. Methodologically, this section draws on the findings of our inductive analysis rather than our systems analysis, with the purpose of understanding conditions that predispose to adverse outcomes and explaining how they came to exist and whether they might be amenable to intervention.

Changes in primary care and community services

GPs have become used to expanding the remit and conduct of the consultation to accommodate new models for care and this was evident in interviews.

> … this was a practice that encouraged patient contact via multiple access methods; that is, patients could consult us over the telephone too, usually indicated by a "T" in the notes. (General Practitioner, Case 139, 65, *interviewer's notes*)

More strikingly, though, adjustments to the changing policy environment had extended beyond changes in the consulting room, encompassing substantive changes in skill mix and the organisation of work in general practice, characterised by increasing numbers of salaried and part-time doctors, trending away from maintaining personal lists towards sharing care among groups of GPs

Box 2 Causal factors underpinning care management problems

Individual staff factors: Change in skill mix with more part time and salaried doctors in general practice and trained district nurses leading a team with a range of competencies. Pharmacists are not trained or incentivised to provide medicine management services and need to prioritise their core services. Evidence can be misinterpreted by general practitioners, hazard warnings may be ignored and risk assessment subject to optimistic bias.

Task factors: Formal handover between staff is unusual and verbal communication between team members is not scheduled. Relevant information is not consistently documented in clinical records. There is no agreed protocol for information sharing between general practitioners (GPs) and district nurses. GP clinical systems do not support diary functions for unscheduled follow-ups. Pharmacy systems are not sufficiently robust to assure medicines adherence.

Team factors: Meetings are unusual. GP work is shared across doctors and with practice nurses. Referrals are made to request actions and facsimile is used to indicate actions completed. GP records, nursing records and pharmacy records are held separately. Different specialists make different assumptions as to what shared care with the GP would look like and specialist advice is usually inaccessible.

Work environment: In general practice there is pressure to deliver against multiple and sometimes competing policy initiatives. District nursing faces demand and capacity pressures and is focused on delivering high levels of activity with a limited staff resource. Pharmacy aspires to developing medicines management services but needs to maintain the commercial viability of the business. Specialists aspire to provide a level of care which they assume the system can deliver, but have no direct responsibility for assuring delivery in primary and community care settings.

Organisation and management: Changes include the introduction of quality payments and patient access initiatives in general practice, increasing professionalisation of community nursing towards specialist roles with industrialisation of non-specialist care, extension of pharmacy roles to include enhanced services and changes in the behaviours of hospital specialists underpinned by working time directives and new commissioning rules.

and rotation systems for home visits, and increasing delegation to practice nurses:

> [The GP] explained that patients with hypertension were monitored on a regular basis every three to six months. Monitoring was done either by the practice nurse or the doctor as appropriate. (General Practitioner, Case 139, 46, *interviewer's notes*)

These approaches have created increased capacity while controlling costs, but also engender new risks as relationship continuity has fallen away.

> OK, I'm just looking at the computer record here. I see I saw [the patient] after the admission. It looks like most of the contact before the admissions was with my colleague… but not exclusively so. I see she's seen [other GP] before, on a couple of occasions. (General Practitioner, Case 355, 6, *verbatim*)

Handover and debriefing were rare in general practice and information continuity has become contingent on the quality and completeness of entries to the patient record, a medium that is intrinsically fallible.

> So there is lack of correspondence between the paper notes and the computer, and you might go on the computer notes and not see there is a disparity between the two. (General Practitioner, Case 394, 138, *verbatim*)

Community nursing was also undergoing substantial change. There was an expansion in opportunities for specialised long-term condition nurses, while traditional district nursing with its focus on a growing population of housebound, disabled and/or elderly patients, faced recruitment problems. Consequently, the nature of the generalist role of the district nurse was changing; the qualified district nurse became a team leader, with patients becoming a 'case load' to be accommodated and distributed among team members with a specific task focus, who aimed to keep each other briefed by meeting at the end of every shift.

> There is one episode documented here on 16th August. Taken by my colleague [healthcare assistant] over there. She was on methotrexate and this is why…. She also had blood taken on the 9th. Sorry, the 9th and the 16th August. She was being seen by the rheumatologist… (District Nurse, Case 133, 171, *verbatim*)

The approach to time management was ruthless, and interactions beyond scheduled work had fallen away. Boundaries were set down to avoid 'mission creep', and no patient was considered to require indefinite care.

> And she is diabetes, we occasionally monitoring her blood sugar and when she get well she went to her GP for monitoring for her blood sugar reading. And then she was quite well. Last summer she went away for holiday so we discharge her from our book. So we have not seen her for a long period, maybe about a year. And then suddenly last November the daughter rang us up. (District Nurse, Case 295, 32, *verbatim*)

Nursing notes were in place to provide information continuity, but were accessible only to the nursing team, and the lack of face-to-face interaction could lead to confusion in respect of roles and responsibilities.

> But yes, you know, who was in charge of the case? Me or who? Who was actually the person who should have been monitoring the sugars and checking up? Should have been me but they [the district nurses] were doing the day-to-day stuff, weren't they? (General Practitioner, Case 398, 831, *verbatim*)

Pharmaceutical care is defined by Hepler and Strand[16] as "the responsible provision of drug therapy for the purpose of achieving definite outcomes that improve the patient's quality of life." Our findings suggest that pharmacy practice was focused mainly on checking prescriptions and providing informal advice at the time prescriptions were issued, with less attention paid to compliance and monitoring.

> Oh yeah, most of the time. Because we tell [the patients] that, look, OK, I know you are taking it for this thing, but you can't take it with an anti-inflammatory. You must be careful if you are allergic to … Sometimes people don't even know they are allergic to aspirin. And if you take that you know that also could affect it. (Pharmacist, Case 139, 175, *verbatim*)

Some pharmacists offered more generic health maintenance advice (typically advice to manage weight and exercise regularly) or smoking cessation services to patients, but record-keeping systems were poorly adapted to a systematic role in monitoring medication usage.

> But you know you just can't tell what's gone… If you don't see anyone you don't know the background to why you are missing them… (Pharmacist, Case 394, 307, *verbatim*)

Reappraising shared care

Where medical and community nursing staff were involved in addressing continuing care needs of a patient, working arrangements appeared to be more a matter of pragmatic alliance than true team-based care. GPs described how contact with district nurses had decreased and how scheduled team meetings were always at risk from the pressures of daily work and geographical separation:

> …the district nurses used to come and do clinics here so we would bump into them almost every day; they would be picking up [pre]script[ion]s at reception and we would see them all the time. We could keep up with the kind of the immense amount of information that there needs to be between the two. About two years ago [the district nurses' clinic] dried up because of a funding problem. Since then we still aim to keep in touch with

monthly meetings. But the district nurses are not always able to make someone free to come to those meetings. (General Practitioner, Case 394, 310, *verbatim*)

Sometimes, a range of modes of communication would be employed in the hope of keeping relevant parties informed, typically faxes or verbal messages. Often there was no real framework for negotiating or planning care, and role understanding including responsibility for case management and leadership remained ill-defined.

And they would liaise with the district, with the diabetes nurse as to how to change the dose and if they couldn't get hold of them I suppose they would call us and if she was having a hypo. I mean I think I came in a couple of times and changed the dose if she was having hypos and I juggled the morning dose. (General Practitioner, Case 389, 127, *verbatim*)

We did identify one example of a pharmacist participating in multidisciplinary meetings, but this appeared to be an exception rather than the rule with the pressures of running the pharmacy a major barrier for the majority.

I would say that generally I, one of the problems…problems for me is that I always seem to be fairly chaotic and I, it's busy and erm I find it difficult to get through the day really. And that's not an excuse, but it's a good excuse really. (Pharmacist, Case 295, 599, *verbatim*)

In respect of hospitals, variation in shared care models were recognised, with each involving different relationships and responsibilities between GPs and hospital teams. In some cases GPs assumed that specialists would accept responsibility for managing the problem underpinning referral, in others that the referral was only for advice and in yet others that the contribution of the GP and consultant to the patient's continuing care would be agreed through a shared management plan. Difficulties emerged when consultant and GP were operating under different assumptions, as clinical letters between primary and secondary care carried only clinical information, and rarely provided a medium for clarifying assumptions on roles and responsibilities.

But at times they see them early or anything like that. If there was an abnormal thing or we have noted this abnormal thing and we are not clear now what is going to happen to this patient. Is she going to be followed up, to be…Plus seeing her age and her heart, well this…I am now thinking, right, of this thyroid. Do we start her thyroxine in the community? Or do we ask a specialist to look at (her) because of her heart condition? Which can precipitate her angina or anything like that. How much dose to start at the age of ninety-two? (General Practitioner, Case 393, 701, *verbatim*)

Efforts might be made to clarify information or to renegotiate care plans, but the prospect of a personal clinician-to-clinician conversation could sometimes feel remote.

A pretty desperate situation. The consultant is not there. The secretary is a temp secretary. (General Practitioner, Case 392, 987, *verbatim*)

DISCUSSION

Principal findings

We used a systematic approach developed for accident investigation to document the sequence of events, precedents and antecedents in seven patients admitted to hospital with medication management problems. We then analysed the same data using an alternative, more inductive approach, which offered additional insights, suggesting certain commonalities of wider context that explain why many apparently isolated incidents arose. Our first analysis shows how poor judgement, slips or deviations from best practice can emerge in a work environment with pressures on human resources and task complexity, phenomena more than adequately covered elsewhere,[9] and addressed in part by computerised alerts and clinical decision support systems.[17] Our second analysis goes beyond this and highlights how policy changes and organisational shifts have given rise to a situation in which traditional intraprofessional and interprofessional roles, assumptions, channels and media of communication have been disrupted, creating new risks to safety of care.

Meaning of the study

Some of the organisational shifts identified in our study are well documented. Several authors have highlighted, for example, how the changing policy context of primary care in England—and in particular, changes to the GP contract and the introduction of financial incentives attached to the attainment of quality indicators—has given rise to changes in the organisation of primary care, changes in professional responsibilities and more hierarchical relationships between members of the primary care 'team'.[18 19] Similarly, a shift towards more task-focused nursing has been noted in primary care, with 'technical' tasks increasingly undertaken by lower-grade nurses and healthcare assistants while senior nurses adopt the role of 'case managers', with less face-to-face patient contact and a less holistic mode of patient care.[20] There is also considerable evidence on the impact of the working-time directive on the work of hospital doctors.[21] What our study highlights, however, is the way the cumulative impact of such changes, in the context of an ageing client group with increasingly complex needs, can create latent problems in the system that precipitate active failures.

Two connected features of the changing primary care context stand out in our analysis as having had particular unintended consequences in terms of risks to medication safety. The first is a de facto shift in the way in which those with overall responsibility for patients' well-being discharge this duty. Apparent from our data is how GPs and district nurses, who would traditionally

have had regular face-to-face contact with their patients, now instead exercised their responsibility through a team of practitioners. In a similar manner to changes in the organisation of social care two decades before,[22] the continuous care of a single individual has been replaced by a system of narrower specialisation and oversight, with the GP or district nurse taking the role of a 'case manager'. This segmentation of care and stratification of responsibilities is not in itself necessarily problematic, but has been accompanied by a second shift, whereby increasingly intensive workloads reduced opportunities for interprofessional interaction and face-to-face discussion of cases among practitioners to facilitate effective shared care.

Shared care depends on agreed roles and responsibilities, task delegation, implementation and review.[23] None of this was consistently interpreted among the informants in our study. Indeed, working practice was characterised by assumptions of roles and responsibilities projected onto others which were not always shared by those to whom the roles and responsibilities were attributed. Boundaries could only be challenged by practical measures such as requests for services or interventions, or by reasserting and redefining the scope of what would be offered. The overwhelming limiting factor in addressing the situation was the demise of interpersonal interaction as a channel of communication with loss of forums for interprofessional communication, debate and negotiation.

This points to a problematic situation for the safety of older patients in primary care. It is likely that careful prescribing, simplification of regimes and use of medication organisers can contribute to safer and more effective care, but healthcare providers still need to work within a framework for effective integration of the system of care to assure medication management is optimised, and this will depend critically on the effectiveness of communication between them. The changes that have affected the organisation of care in the community, and the increase in the complexity of the cases of patients managed in primary care, are just as profound as similar changes affecting secondary care. Yet while secondary care has had some (albeit patchy) success in improving processes such as handovers, information management systems and multidisciplinary team meetings in response to such changes,[24–26] primary care appears to have lagged behind in this regard. Indeed, the more spatially and organisationally dispersed setting of primary care has meant that as the division of labour has become more pronounced, with different groups responsible for different aspects of the same patient's care, opportunities for interprofessional, interdisciplinary and interorganisational communication have failed to keep up.

There is no prospect that the continuing pressure on healthcare to change and adapt to external pressures will cease. Bleakley[27] argues constructively for the demise of the 'team' and the replacement by more adaptable working arrangements. Fundamentally, this adaptive way of working requires means of negotiating and renegotiating roles and tasks. Hall[28] believes an educational approach is required to enable different professions to understand roles and perspectives and to teach them how to function as a team. Our position is that the required transformation will need more, that the phenomenon of the 'communications space' needs revisiting, and as a matter of urgency. The communication space is that part of the total number of information transactions that involve interpersonal interaction; this can be asynchronous as with exchanges of emails or facsimilies or synchronous when individuals interact in real time. Coiera[29] has argued that small clinical teams can generate a large and complex communications space and that asynchronous communication places limits on communication functions such as role negotiation and clarification, goal setting and problem solving. The communications space for shared care in community settings has receded and needs to be enlarged with concomitant improvements in communications technology, process and protocol to support effective multidisciplinary working.

It is unlikely that the communication deficit that we have identified in our study can be addressed through technological fixes alone, and indeed this would seem ill-aligned with the spirit of the communications space. On the other hand, our study shows that opportunities for interpersonal interaction of the kind envisaged by Coiera are at a premium in contemporary British primary and community care. The objective must therefore be to find ways of permitting the transmission of crucial contextual knowledge and the building of trust as efficiently as possible alongside transfer of clinical information; lessons might be learnt from work undertaken on handovers in hospital care that point towards how best to secure effective communication despite the limitations of time and the burden of large case loads, and to effective vehicles for multidisciplinary decision-making that have been implemented where staff are dispersed across multiple locations.[24–26] Future research might focus on how such work can be translated into the context of primary and community care.

Strengths and limitations

The study adopts a systematic approach among a series of older patients with preventable medication-related admissions, includes interviews with a range of healthcare staff and analyses the data using two complementary theoretically robust approaches. We applied *both* systems analysis against an established accident causation model *and* inductive analysis of the same materials embracing sociological perspectives, extending our interpretative scope. The accident investigation approach is rooted in psychology and engineering, and the investigation framework supports a classificatory approach that highlights how processes and the organisation and management of work

can predispose to errors and mistakes among human players in the system. The analysis of interviews using the constant comparison method fostered a broader contextual view on how new ways of working driven by the ethos of productivity are disrupting traditional intraprofessional and interprofessional roles, assumptions, channels and media of communication.

The findings are based on data from 16 interviews relating to seven patients. As is always the case, the interpretation of the findings may have been influenced by the perspectives of the interviewer and other members of the research team. We believe the mix of perspectives in our team brings strengths to the interpretation of the findings, but the relevance of the findings to other settings will still depend on judgements drawing on broader research and local knowledge. The accident investigation approach used starts with a description of the clinical case based on review of available materials, but does not attempt to ascertain from patients what went wrong, how and why. As such, the patient voice is not represented in the narrative generated in this study. While this is consistent with the accident investigation approach used, in-depth patient interviews might have added an extra dimension to the findings that cannot be captured by interviewing staff.

CONCLUSION

New ways of working driven by policy changes and the ethos of productivity are disrupting traditional intraprofessional and interprofessional roles, assumptions, channels and media of communication. There are particular implications for the execution of shared care where reduced communication space, and more restricted and typically asynchronous modes of communication, are increasingly the norm. Concomitant improvements in communications technology, process and protocol in primary and community care are urgently required to offset a potentially serious downside to patient safety.

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Competing interests None.

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