ACUTE MEDICINE
UK CONSENSUS CONFERENCE

Improving quality *of* care *through* effective patient flow – *it's* everyone's business!

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Contents

The full RCPE UK Consensus Conference on acute medicine supplement is available at:
http://www.rcpe.ac.uk/policy-standards/rcpe-consensus-statements

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Foreword

Previous RCPE Consensus Conferences have focused on the treatment and management of particular conditions. It is very interesting to see this approach being applied to a common dysfunction of health systems – problems with the flow of patients through the system.

There are several important lessons from this process. First, many of the same skills used in medicine for diagnoses and treatment planning can be applied to the analysis of complex organisational systems. Second, traditionally where the organisation of care has been considered in the past it has been common to approach the system using models based on a static or steady state. This has led to oddities such as measuring occupancy as an average of the use of beds at midnight which fails to capture the huge fluctuations. Acute medicine is a dynamic set of interacting processes with a great deal of feedback and the idea of flow is key to understanding it and managing it. This requires a new set of tools and ways of thinking and unfortunately common sense proves to be a relatively poor guide.

Using the patient perspective to think about the process is a powerful way of identifying priorities and testing whether ideas about the design of systems are really going to benefit patients or are being designed for the benefit of providers.

A number of common themes emerged from the discussion.

- The importance of senior decision-makers being available as early as possible and providing frequent input during the patient's care is key: this means seven days a week and over extended hours. This is particularly important because the ambition is to provide more care on an ambulatory basis and to ensure that admission is a positive action based on the needs of the patient: not for decision-making later.

- The development of dedicated multidisciplinary teams supporting medical units is clearly important. What is less obvious is that some of these currently do not function as teams. Members do not have well developed ways of working and there are lost opportunities through members remaining in narrow professional silos. There is more scope for roles to overlap and for cross-disciplinary leadership.

- A third theme is about the growing significance of measurement, particularly patient experience. The speed with which acute medicine now moves means that times measured in days fail to capture what is being done in a meaningful way. We need stopwatches not calendars.

- The crucial and difficult role of the medical registrar was a significant issue. They need more help and support from the rest of the hosptial but they also need a system that works. This means redesign and rethinking of much of the system.

There is now a body of knowledge about flow and how to create it which includes a number of tools and techniques that need to be understood by acute physicians and healthcare managers. Problems such as multiple moves, boarding in the emergency department, missed and lost patients, delayed discharge and sometimes worse often have problems with flow at their root. This means that the skills, ways of thinking and techniques need to be taught to everyone involved in acute medicine.

Nigel Edwards, Senior Fellow, King's Fund
Chair of the Consensus Panel

Membership of the Consensus Panel

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RCPE UK Consensus Conference on 'Acute Medicine: improving quality of care through effective patient flow – it's everyone's business!'

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Held on 15 and 16 November 2013 at the Royal College of Physicians of Edinburgh

INTRODUCTION

Growing demand from an ageing population, increased complexity and co-morbidities brings challenges and opportunities for acute medicine. Improving the flow of patients across the health and social care system is essential. Action must be taken to ensure that patients are treated safely and effectively, and with care and compassion in a system that they trust.

Key Points:

* Quality, safety, and dignity in patient care are paramount. It's everyone's business to ensure that we continually listen to patient experience, and act on it, to improve all aspects of care.
* Clear communication is vital. There must be a culture where all parts of the system communicate with each other, and with patients/carers, to facilitate flow and improve the patient experience.
* To create flow there needs to be seven-day and extended hours working in hospital and across the system; senior clinical decision-makers must be available 24/7.
* Patients must be treated in the right place, and in the shortest time possible. This requires the right numbers of staff and mix of skills across health and social care.
* All systems must have good patient flow to eliminate boarding.
* Information systems to produce real-time data must be used by clinical teams to improve patient care and flow; there must be a culture of continual improvement.

HOW CAN WE IMPROVE THE EXPERIENCE OF BEING ADMITTED TO HOSPITAL FOR ACUTE MEDICAL PATIENTS?

Patients in hospital want to be treated with compassion and respect, in a safe environment, and to know what is happening and why.

To improve patient experience we need:

* clear communication at all levels, including between patient and health professionals, family/carers and health professionals, and across health and social care;
* patients to feel safe: this requires a clear explanation of what is happening and why, and appropriate reassurance to be given as soon as possible; they must know who is in charge of their care;
* a competent clinical decision-maker to see the patient promptly to decide whether or not to admit;
* a plan, developed with active involvement of the patient, where possible, and with family/carers. Patients should be supported to make informed choices about their own care even where this involves risk.
* to ensure people are not admitted unless necessary and that they go directly to the right place;
* systems to be designed on the basis that a significant number of patients will have cognitive impairment and other complex care needs;
* to listen to, and hear patients. We must capture patient experience with validated local and national surveys conducted regularly, supplemented by patient stories. Results must be fed back promptly to clinical teams, and acted on.

HOW CAN THE MULTI-DISCIPLINARY TEAM WORK TOGETHER TO IMPROVE PATIENT EXPERIENCE AND CLINICAL OUTCOME?

Each acute medical unit must have a dedicated, effective multidisciplinary team (MDT) with consistent and appropriate membership, which should be centred on patients/carers. Individual patient care must be led and co-ordinated by the most appropriate member of the MDT. There must be strong cross-disciplinary leadership and clear agreed goals for patient care based on a shared understanding of risk.

The MDT will:

- undertake an appropriate assessment within 14 hours and aim to produce an individualised care plan in conjunction with the patient within 24 hours;
- ensure that patients are reviewed regularly, twice daily as a minimum; care plans and goals should be updated;
- seek and act upon real-time patient feedback as standard practice;
- provide extended hours and seven-day working. Advanced practice roles and shared skills must be developed to maximise staff resource and availability;
- include the senior nurse who is responsible for the overall co-ordination of ward activity; this will be recognised as a supervisory role;
- plan the patient's discharge from the time of admission, including an estimated date of discharge; working with the primary/social care teams, and the patient/family is vital.

WHAT SHOULD PATIENT FLOW LOOK LIKE IN A SYSTEM WHERE ACUTE MEDICAL PATIENTS EXPERIENCE EFFECTIVE, EFFICIENT AND TIMELY CARE, WITH NO ADVERSE IMPACT ON OTHER CLINICAL AREAS?

Emergency activity is predictable. Capacity must be aligned to meet demand. This will require an extension of seven-day working by clinicians and support services both in hospital and community.

To make this happen we need:

- patients to be seen promptly by the right competent clinical decision-maker;
- safe, effective alternatives to admission, such as ambulatory care;
- patients to be seen as soon as possible by the admitting consultant physician in line with Society for Acute Medicine clinical quality indicators for acute medical units;
- the medical registrar role in the admissions process to be locally defined and appropriately supported for that registrar's level of competence;
- the admitting consultant physician to have no other clinical commitments in line with Royal College of Physicians of London guidance (Consultant physicians: working with patients revised 5th edition, 2013) and to adopt a flexible and dynamic role in managing flow;

- all relevant specialties to contribute to the care of the acute medical patient; this includes medical subspecialties and others such as radiology and mental health;
- plans to be clearly documented to allow action without further consultant review;
- patients to move to the right clinical area first time. Boarding is a symptom of a dysfunctional system; we should have an ambition to eliminate it by tackling the underlying causes;
- patients to be moved only for clinical reasons and with a structured handover;
- to ensure continuity of care through innovative working patterns and communication;
- to recognise the high variability of elective activity; it must be separated from emergency activity and spread more evenly;
- effective utilisation of integrated IT systems to facilitate flow, discharge and alternatives to admission;
- patients to be reviewed and discharged as early in the day as possible from all clinical areas, seven days a week.

HOW DOES HOSPITAL DESIGN INFLUENCE PATIENT FLOW THROUGH ACUTE MEDICAL UNITS?

Hospital buildings, processes and staffing must be designed to optimise the flow of patients through the system in a safe, timely, and efficient way. They must be flexible and have enough capacity to accommodate surges in demand now and in the future.

To make this happen we need:

- all acute medical units to have the capacity to provide ambulatory care;
- the unit to be near radiology, critical care, and the emergency department;
- a split, as far as possible, between acute and elective services and accommodation;
- hospital wards to be designed or adapted to provide enough space to be a safe, clean, quiet and dignified environment for patients;
- patients and other stakeholders to be involved in design and continuing development of hospitals;
- standardisation of room layout and equipment;
- environments designed to meet the needs of people with sensory, cognitive, physical and other impairments;
- to build in the infrastructure to support new technology.

This paper is an explanatory paper for consideration of stakeholder opinion and relevant data that are in the public domain

The patient experience: what does the evidence tell us?

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INTRODUCTION

While some evidence exists on patient satisfaction with inpatient or urgent (community-based) care and emergency care, there is little focused specifically on the process of admission to an acute medical unit or transfer between units and care thereafter. A broad search of the published literature was undertaken using the following key words: acute medicine, emergency admissions, acute medical admissions, boarding, outliers. While this generated more than 100 papers, there was little of direct relevance. Most published research considers general hospital environments, concerns about cleanliness, food or toilet facilities, etc. or waiting and communications in accident and emergency departments and out-of-hours services.

Currently insight into patient perspectives on the admission process and immediate care has to be derived from other clinical services or from patient feedback, but this has been relatively sparse until recently with the introduction of the Patient Opinion website.[1] Access times, clear communication of diagnosis, progress, next steps and confidence in the clinical competence of the multi-disciplinary team are all likely candidates for attention as we seek to improve the quality of patient experience in an acute medical unit.

There is a clear research gap and new methods of system-level research using parameters that matter most to patients are required urgently to support quality improvement during the admission and early assessment processes.

WHAT STANDARDS SHOULD PATIENTS EXPECT?

The NHS Constitution establishes the principles and values of the NHS in England in terms of general expectations of the quality of care and there is some evidence that expectations may be increasing, driven in part by high-profile reports of poor-quality care.

In Scotland, the 'Better Together' research commissioned by the Scottish Government established a hierarchy of issues important to patients receiving hospital inpatient care, including:
- Cleanliness and hygiene;

- Prompt treatment in an emergency;
- High-quality clinical care (getting the best treatment for my condition, doctors knowing enough about my condition and treatment);
- Clear explanations of the patient's condition, treatment and any risks or dangers (clear explanations about what will happen during an operation or procedure, clear explanations of my condition or treatment, being told the risks and benefits of any treatment in a way I can understand; and being told how my operation or procedure has gone in a way I can understand);
- Being treated with respect and dignity.[2]

The 2009 National Confidential Enquiry into Patient Outcome and Death (NCEPOD) report '*Deaths in Acute Hospitals: Caring to the End?*' identified delays in accessing senior (consultant) opinion among the main contributors to avoidable mortality for complex cases[3] and this fed the debate on access standards and 24/7 working in acute medical receiving units.

The Society for Acute Medicine (SAM) standards now include four explicit standards, including application of an early warning score, timely access to competent decision makers to formulate an effective treatment and diagnostic plan and that patients and their plans should be reviewed by a consultant within 12 hours.[4] However, few patients will be aware of these standards and in the absence of clear expectations it is difficult to assess and interpret levels of satisfaction.

An early systematic study of patient expectations in acute settings is the work of the Picker Institute Europe that attempted to tease out factors important to acutely ill patients and identified that both technical and interpersonal skills are rated highly.[5] Their top ten aspects of care include:

- Doctors know enough medical history and treatment;
- Doctors respond to patient questions about their condition and treatment in a way they understand;
- Staff give confidence and trust to patients;
- Doctors wash/clean hands between patients;
- Nurses know enough medical history and treatment;
- Clear explanation of operation or procedure in advance;

M Jones. E Tait

- Risks and benefits are explained in a way patients understand;
- Nurses wash/clean hands between patients;
- Rooms/wards are clean;
- Doctors and nurses are open with patients about treatment or condition.

Confidence in the clinical competence of doctors and nurses, cleanliness and understanding what will happen during any operation or procedure are rated as the most important. However, this gives little insight into how best to design an admissions system to reflect the needs and preferences of patients.

PATIENT SATISFACTION WITH URGENT MEDICAL CARE

Studies in Canada have looked at patient contributions to safety when treated as inpatients and suggest that the paradigm shift from paternalism to partnership works less well in acute and emergency situations than in chronic conditions where patients can become experts and less passive.[6] Acute patients expect clinical competence and question little, trusting that they are getting the best care.

A study in the US exploring the importance of clarity of communication confirmed the impact that understanding the reasons for admission and the test results had on patient satisfaction.[7]

Another American study to determine whether patients, delayed in accident and emergency departments, would prefer to wait closer to their inpatient medical facility (albeit in corridors) confirmed the importance of response times and shorter waits with the majority defining 'prompt transfer' as within three hours.[8]

A qualitative study undertaken in Yorkshire in 2006 explored patient preferences in terms of where they sought help in an emergency.[9] The results reflected the findings of previous studies, indicating that speed of response is a key factor, but clarity of communication by healthcare professionals is also valued, including continuity of information between different parts of the system. Patients reported dissatisfaction with being 'left in limbo' and uninformed, although this refers as much to progress between organisations as to the admission process within a single hospital. The authors recommended new system-level questionnaires rather than the more usual service-specific versions.

GIVING PATIENTS THE OPPORTUNITY TO PRAISE AND COMPLAIN

The intensity of clinical activity, combined with the anxiety of patients requiring an unplanned admission has deterred specific investigation into patient experiences of acute situations, leaving clinical teams and planners to derive patient needs from memory and/or feedback and complaints raised later in their stay.

As stated above, O'Cathain and colleagues commented on the paucity of work considering patient experiences of systems rather than individual services or locations and this is of direct relevance to the process of admission for acutely unwell medical patients.[9] In a 2013 review article, Robert and Cornwall also worry about the impact of current methods of capturing patient experience and of board level reluctance to take due notice of it.[10] They recommend a single national indicator of satisfaction (currently being piloted in England under the 'friends and family' test), combined with qualitative local data about what matters most to patients in given situations. Together these could provide a more useful source of quality improvement information for policy makers.

USING PATIENT FEEDBACK (PATIENT OPINION WEBSITE)

The importance of patient feedback has become increasingly apparent over the past decade, with websites such as www.patientopinion.org.uk providing a focus where patients can express their views so that professionals can review their concerns and, hopefully, address them. Patient Opinion was founded in 2005 and more than 45,000 patient stories have now been published and these have been viewed 51 million times by the public. More than half of these stories are positive, a third are mixed and a sixth negative; while these proportions may be well known to the caring professions, it certainly does not reflect the negative image often given by the popular press.

The Patient Opinion website enables organisations to use patient feedback more effectively. The ways that this can help include:

- Enabling department level/service manager ownership for listening and responding to online patient feedback;
- Demonstrating to staff how the care they provide is experienced;
- Improving online communication culture and reaching more people, more quickly than ever before;
- Hearing the voices of hard-to-reach patients, including those with problems with substance

misuse, mental health, self-harm, sexual health, continence, etc;

- Publicly demonstrating commitment to constant service improvements based on feedback;
- Celebrating staff successes and restoring professional satisfaction and pride;
- Complying with national policy drivers to increase transparency and public engagement;
- Collecting friends and family test data in line with national guidance;
- Reducing cost;
- Gaining support for the changes patients want to see;
- Providing stories for professional development and reflection within the team/department.

Since its inception Patient Opinion has increased its profile with many patients and carers in Scotland as evidenced by the fact that stories shared on the site have increased five-fold (almost 500,000 hits), with almost 70% responded to by health services. Overall, only 8% of the stories that have shared concerns have led to changes or improvements, but this is gradually improving. In July 2013 there were 59,744 stories told, with 1,984 staff listening, 63% of which received a response and 13% of responses to concerns led to change. A further effect of the increased presence of Patient Opinion in Scotland has been to increase the number of professional groups that are working with them, including general practitioners, community health partnerships, alcohol and drug partnerships, higher education organisations, Healthcare Improvement Scotland, Scottish Public Services Ombudsman (SPSO) and third-sector health and social care organisations.

In their contributions patients make many positive comments about organisations and staff; the most common being 'helpful', 'caring', 'providing excellent care' and 'good hospital'. Less positive comments focus on appointments, waiting times, admissions and advice received. Two exemplar comments follow:

Case 1: Positive feedback

My mum had been very unwell with an infection. She had been seen by an out-of-hours GP who referred her to the medical emergency assessment unit at Llandough Hospital, Cardiff. I stayed with her while she underwent assessments and we waited for the results of the tests carried out. This took around four to five hours. She was diagnosed with pneumonia and admitted for further treatment. The care and treatment she received at MEAU was excellent. The staff were lovely and I could not have asked for more. I would like to thank them for the service my mum received, she was very anxious about being in hospital and they put her at ease.

Case 2: Negative feedback

My husband has been in two separate wards during two long visits with the same conditions. The first time he was diagnosed with one major underlying condition but also another condition they couldn't pinpoint. He was put on a strict course of medicines for the first condition and treated to ease the second condition while it was being investigated further. He came out of hospital and was put under out-patients and given the strict rules that should be kept to no matter what in regard of the times he took two of his medicines.

He has since been re-admitted. This time he is on a different ward. The worst part is that they are not keeping to the strict medicine-taking conditions that both doctors and other officials are stating they should. If the times aren't kept to, he is prone to all manner of things, thus putting his health in danger. Staff on the ward have been told repeatedly about how important this is, but he still has to beep pretty much every time he is due the tablets. He's then ignored to the point of placing him in the danger zone.

I also noted that the room he was put in still has things in it that belonged to the previous occupant, one of which was a used sick bowel/wash tub and a used towel. The room's TV wasn't working and we had to ask repeatedly to sort this out as he had no other way of keeping himself occupied. This was ignored for thee days. When we happened to get someone who wanted to help, the TV guy was there and had it fixed within 20 minutes of asking. This on top of the room blind being broken and permanently down so that the room had no natural light.

Another disturbing occurance was two instances of agency covering staff taking away jugs of water that stopped him getting dehydrated and two occasions of agency cover staff going into his personal drawer after already adminstering tablets from the locked secure drawer (they have no reason to go into the personal drawer).'

SERIOUS COMPLAINTS TO THE SCOTTISH PUBLIC SERVICES OMBUDSMAN

Consideration of negative patient and carer experiences, as reported through formal complaints to the SPSO, can also give insight into quality gaps, both in terms of process and outcomes. Complaints about healthcare to the ombudsman in Scotland increased steadily from 238 in 2004–05 to just under 1,200 in 2012–13, with the health sector experiencing the highest increase (28% increase over 2011–12). Regretfully, general medical complaints (excluding care of the elderly) are the second highest after general practice. However, the

M Jones. E Tait

majority of these reflect problems with clinical treatment, diagnosis and communication and less than 1% relate to admission, discharge and transfer processes between the various disciplines. In the most recent report, there was a single complaint relating directly to the process of admission.[11]

Where a specialty breakdown is available, general medicine and care of the elderly fare badly by comparison with other specialties, generating significantly higher numbers of formal complaints than any other group, including those from accident and emergency. In total, 20% of health complaints come from these two groups, with the major cause for complaint being clinical diagnosis and treatment. In the 2011–12 report the SPSO made particular mention of acute hospitals failing to manage acutely unwell patients suffering from dementia[11] and this presents a particular challenge during the admission process. Also in his written advice to the Health and Sport Committee at the Scottish Parliament the ombudsman draws attention to the importance of tracking the patient journey across sectors and between organisations, particularly for older patients who make up the major population at risk.[12]

Two rare examples of vignettes reported by the SPSO and relevant to admission and urgent hospital care follow:

Example 1 (from the SPSO Annual Report 2011–12)

The complainant (Mrs C) complained about the care and treatment provided to her husband (Mr C) following his admission to the Royal Alexandra Vale of Leven Hospital. Mr C was 90 years old and was admitted because he was suffering pains in his legs. Prior to his hospital admission he was living independently with no other immediate health concerns. Mr C developed pneumonia in hospital and while being treated for this developed diarrhoea, kidney failure, a pressure ulcer and severe oral thrush. Mr C subsequently died. Mrs C felt the hospital staff's lack of timely action had contributed to Mr C's death.

The ombudsman's recommendations in this case included conducting an audit to ensure the timely assessment of all acute admissions by consultant medical staff; reviewing the implementation of the fluid balance chart policy, with an emphasis on the identification of the appropriate point for staff to escalate concerns and ensuring junior medical staff at the hospital receive full training on the management of elderly and acutely ill patients with the aim of preventing kidney failure.

Example 2 (from the SPSO Annual Report 2012–13)

Ms C, who is an advice worker, complained on behalf of Ms A about the care and treatment that her late father (Mr A) received during the last three days of his life and about how her complaint about this was handled. Mr A's GP referred him to a medical admissions ward. Mr A went straight to the ward and was asked to wait in the day room. He remained there for four hours before he was seen by a doctor, given a bed and treatment was started. Information on his referral showed he was very unwell, indicating that he had pneumonia and kidney failure. Mr A was treated with antibiotics and was transferred to a different ward the next day.

The ombudsman's recommendation for this aspect of a more complex complaint was that the hospital's clinical directorate should consider the risks involved in using the day room on the admission ward as a waiting area and consider mechanisms to avoid these risks.

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Patient experience: what does it mean for an acute medicine consultant?

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INTRODUCTION

Take a look through the 'experience' lens to appreciate how it feels to be cared for in our systems; it is enlightening. When time is limited and there are so many barriers to delivering essential technical care, the human part of care can feel like an extra task. However, it turns out that being more patient- and family-centred doesn't add work. Thinking about patients' emotions becomes a habit. I have started this journey and found it fulfilling and pleasantly challenging. There are no proven methods so there is a sense of creativity – something that is welcome in this era of guidelines and scrutiny.

Acute medicine is there to improve on the previous model of medical take,[1] and one of the attractions of the specialty is making care better. Patient-centred thinking is essential if we are to achieve a truly high-quality product. It is easy to lose sight of things that are in front of us every day: the fear and uncertainty of the newly unwell, the frustration of recurrent attenders, the inadequacy of services for the most vulnerable. But these things need to be addressed if a service is to be excellent.

Trusts have invested in new posts in acute medicine, and they expect returns. At the moment, perhaps, they will look for capacity, flow and admission avoidance. However, we must be advocates for our patients' whole care, to ensure that quality of experience is on the list, too. There is no conflict here; avoiding unnecessary hospital stay is a key to optimising experience. And managers are human too and they and their loved ones are service users; it is not hard to sell the message that experience is a key healthcare outcome. Being a patient-centredness champion isn't as hard as it might appear.

PATIENT EXPERIENCE: WHAT IS IT? CAN WE MEASURE IT?

Patient experience is important. It is emphasised in the Health and Social Care Act and the NHS mandate.[2,3] Patient experience is what happens to a patient. It is not the same as satisfaction, which can be biased by expectation and which doesn't contain the detail needed to target improvements.[4] Intangible but real, experience can be 'measured' using properly validated psychometric questionnaires,[5] such as the Adult Inpatient Survey (AIPS),[6] which is based on research into what matters to patients.[7–9]

The Care Quality Commission mandates the administration of AIPS to 850 consecutive discharges from all acute trusts in NHS England and results are publicly reported at whole organisation level. We have shown that the AIPS remains valid in single specialty groups.[10] However, the numbers of annual responses from individual local units in the current scheme are too small to be meaningful. Inpatient, out-patient and emergency department experience survey results are not consistent within trusts,[11] and it is likely that discrepancies also exist between different in patient units within a hospital. It would be valuable to have local acute medical unit (AMU) data; this would be more meaningful to staff than a hospital-wide average. Larger numbers are commissioned internally in some trusts, although the data are generally not released publicly. A nationally co-ordinated standardised programme with adequate numbers would be an important step towards being able to compare, track and benchmark.

At present, responses are solicited at a scale for the net promoter score, or 'friends and family test', as it is a requirement that this is available to all patients. However, this is a satisfaction survey and fails to provide the granularity needed to identify specific shortfalls and monitor their improvement in a systematic way. In addition, the friends and family test has been criticised for being only moderately associated with other measures of experience. Patients can find the language confusing and objectionable and the presentation of results is misleading.[12–14] Its high average scores also suggest a ceiling effect, which reduces sensitivity.

What we really need is rigorous data on the details of experience that matter to patients, using properly validated instruments, administered to larger numbers of patients, so as to have meaningful results for individual AMUs. Seeing local data and realising that there is a problem is an essential step in mobilising the will to improve.[15]

PATIENT EXPERIENCE IN ACUTE MEDICINE: HOW ARE WE DOING?

We have re-analysed national data for a group of patients of interest to acute medicine, short-stay emergency medical admissions who stayed in their first

ward.[16] These are patients who are the remit of acute medicine, and since almost all hospitals in England have an AMU,[17] they are very likely to have stayed entirely on AMU (admissions to CCU and intensive care units were excluded). Data from NHS England from 2010,[18] which is the latest year reported with specialty attribution, show that these acute medical patients scored less well than comparable acute admissions in other specialties for pain control, privacy, involvement and discharge medicines information and instructions. Acute medical patients scored less well than scheduled admissions for all questions (Table 1). These differences reflect the challenges and distractions of a high acuity, rapid turnover context, but this does not remove the responsibility or accountability for the specialty to make improvement.

PRACTICAL APPROACHES FOR IMPROVEMENT

Changing patient experience is a huge challenge and there are no tried and tested formulae. Good patient- and family-centred care depends on the behaviour of every member of the multi-disciplinary healthcare team. This can only be achieved by excellent leadership, and in this respect the consultant acute physician is well placed to exert influence, modelling compassion and empathy and being explicit in expectations. It is not difficult to bring others on board; patient-centredness is highly infectious. Just being involved in work to improve experience, especially when patients are involved on the team, is powerful. This is the most satisfying part, seeing colleagues' attitudes change.

As with most improvements, a multi-pronged approach is best.[19] One way to improve experience scores would be to pick off individual poorly performing questionnaire items at local and national level. Targeting the items contained in the AIPS might be 'teaching to the exam', but this is legitimate as the questionnaire has been carefully constructed to reflect patient priorities. Examples of specific, achievable changes include better processes for pain control, making it easier for families to have access to clinical staff and, where possible, moving sensitive discussions away from the open ward to improve privacy. It will be important to recognise that this will be an endless job, since as each critical constraint on good experience is removed, another will be promoted to the 'premier league' of priorities.

This targeted, piecemeal approach has the potential to resolve some of the barriers to good experience. However, another key driver of patient experience is the quality of human interaction. Unlike most technical aspects of care, this can happen any time, in any place and with any member of staff. Customer care training is available with evidence of variable impact, but improving professionals' responses to unpredictable, complex and bespoke patient needs probably requires a higher-level solution.

TABLE 1 AIPS questions included in the analysis of AMU patient experience for 2010

When you had important questions to ask a doctor, did you get answers that you could understand?
Did you have confidence and trust in the doctors treating you?
Did doctors talk in front of you as though you weren't there?
When you had important questions to ask a nurse, did you get answers that you could understand?
Did you have confidence and trust in the nurses treating you?
Did nurses talk in front of you as though you weren't there?
In your opinion, were there enough nurses on duty to care for you?
Sometimes, a member of staff will say one thing and another will say something quite different. Did this happen to you?
Were you involved as much as you wanted to be in decisions about your care and treatment?
How much information about your condition or treatment was given to you?
If your family or someone close to you wanted to talk to a doctor, did they have enough opportunity to do so?
Were you given enough privacy when discussing your condition or treatment?
Were you given enough privacy when being examined or treated?
(if in pain) Do you think the hospital staff did everything they could to control the pain?
Did a member of staff tell you about the medication side effects to watch for when you went home?
Were you told how to take your medication in a way you could understand?
Were you given clear written or printed information about your medicine?
Did a member of staff tell you about any danger signals to watch for after you went home?
Did the doctors and nurses give your family or someone close to you all the information they needed to help care for you?
Did hospital staff tell you who to contact if you were worried about your condition or treatment after you left hospital?
Overall, do you feel you were treated with respect and dignity?
How would you rate how well the doctors and nurses worked together?
Overall, how would you rate the care that you received?

There are calls for more compassion,[20] which leaders at all levels can promote by their words and actions. Methods are available that increase awareness of patients' human needs, including the collecting and recounting of patients' stories and Schwartz rounds,

P Sullivan

which are case-based and encourage discussion of the emotions of patients, carers and staff.[21] Sharing patient stories regularly keeps us focused on the importance of experience and sensitive to how we can make it better and worse. Stories can be collected using simple notes or, better, simple videos and recounted during team gatherings. For example, some meetings always begin with a patient story.

These approaches can make us want to do better, but we also need the opportunities. We need to look at our systems. Compassion comes from having time to know patients as individuals, to learn about patients' stories and develop intimacy. This requires enablement by a system that minimises chores and bureaucracy and ensures correct staffing levels. The current culture of recurrent bed crises that draws attention away from real caring needs to be removed through effective and pre-emptive flow strategies. Reliable technical care needs to be streamlined so that attention can be focused on the patients themselves. Only by solving the full range of quality issues can we optimise experience.

The solutions discussed so far, even though they are in response to evidence-based needs, come from within the system. They are linear, piecemeal and simply adjust historical processes. What would the admission process look like if designed from scratch, for the modern patient in a modern context, to combine excellent outcomes and experience? Do we know what people want and what their needs really are? We should recognise that the best experts in patient experience are the patients and it makes sense to involve patients in service design from the very beginning. Various terms are used to refer to this approach, including co-design, experience-based co-design and co-production, and there are established tried and tested, yet evolving methodologies available.

Co-design isn't just asking patients to comment on ideas by medical professionals, but truly working together for the duration.[22] Patient and staff experience is collected through interviews, focus groups and observation. These are then used to develop ideas for improvement, with patients working alongside staff on the project team.

TRAINING FOR GOOD PATIENT EXPERIENCE

Much medical training concentrates on optimising the key outcomes of mortality and morbidity, by accurate, reliable technical care. Patient experience must be presented explicitly to trainees as equally important. Trainees must be shown how to deliver and facilitate good experience. Medical trainees are particularly sensitive to the attitudes of the acute medical consultant and can be mentored to develop an ethos of good patient experience. Consultants and senior nurses can emphasise experience in discussions about individual cases, for example on ward rounds.

Trainees could also be immersed in thinking about experience by developing and presenting their own Schwartz rounds, both at hospital level and in local team meetings. With support, trainees can implement quality improvement projects, as evidenced by the success of the Joint Royal Colleges programme 'Learning to make a difference'.

An excellent way to facilitate learning and develop thinking in patient experience is to support trainees in making their own improvements. Trainees at Chelsea and Westminster Hospital are currently measuring patient experience and identifying shortfalls, interviewing patients to drill down to what patients' wishes are and developing discrete interventions. Not only are their own skills growing, but the initiative is spreading awareness and knowledge of experience in the multi-disciplinary team. These approaches would be enhanced by including requirements in the acute medicine specialty curriculum for involvement in an initiative to improve experience, such as having been involved in patient- and carer-centred case-based discussions or in a Schwartz round.

Similarly, other disciplines such as nursing, pharmacy and therapists can incorporate high-level and detailed aspects of providing good experience into training.

THE WAY FORWARD

In the wake of the Francis report,[23] the time is right to promote improvement in this important fundamental aspect of care. The specialty and particularly its national body, the Society for Acute Medicine, can leverage better experience though influencing training curricula and supporting the development of standardised measurement across the UK. It can also provide national best-practice benchmarking targets. There are many doctors, nurses, pharmacists and allied health professionals working in AMUs who are passionate about improvement and who could form a national network to champion experience and work away at the details of how we can become better.

Acute medicine touches a huge proportion of patients admitted to hospital and plays a large part in the lives of many with chronic disease who require frequent admissions. As a young and growing specialty, we are in a position to make the experience of all these vulnerable people better.

Online resources

NHS Institute resource list:
www.institute.nhs.uk/nhs_alert/patient_experience/patient_experience.html
UK experience network:
www.nhsiq.nhs.uk/improvement-programmes/experience-of-care.aspx
Schwartz rounds:
www.kingsfund.org.uk/projects/schwartz-center-rounds
King's Fund:
www.kingsfund.org.uk
Institute for Patient and Family Centered Care: www.ipfcc.org
Care Quality Commission national in patient experience survey results:
www.cqc.org.uk/surveys/inpatient

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The pressures faced by the medical registrar

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INTRODUCTION

The medical registrar (ST3+ grade or SpR) is the most senior training grade of physician working in UK hospitals. The role is long-standing, but with changing hospital practices investigations have examined working practices of the medical registrar and highlighted areas of potential concern.[1] The medical registrar has responsibility for the acute medical take and, as generally the most senior physician on site overnight, plays an increasing role in facilitating patient flow through the front door of the hospital, including flow between downstream wards. It is widely considered to be one of the busiest and most challenging jobs in hospital medicine[2] and a role described by others as the 'workhorse' of the hospital.[1]

However, evidence is mounting that this role is becoming increasingly pressurised and unpopular, with a consequent decline in doctors applying to become medical registrars.[3] In 2010, 49% of registrars were satisfied with their job with respect to acute medicine and less than half would recommend medicine as a career.[4] This negative perception is also prevalent in sub-registrar level doctors; 80% rated the workload of the medical registrar as either 'unmanageable' or 'very unmanageable'.[5]

Not only is it important to understand how medical registrars are expected to facilitate patient flow within an acute hospital, but it is also critical to understand competing demands and pressures on their time (and attention) that may impinge upon their ability to aid appropriate patient flow.

REGISTRARS: THE LITERATURE

On 16 May 2013 we searched Ovid Medline from 1946, using the search terms 'medical registrar' and 'hospital at night'. We found 43 papers, of which 12 were relevant. The results are summarised hereafter.

There are several current changes to medical inpatient care that impact on the role of the medical registrar and their ability to deliver patient care. There are fewer acute and general medical beds,[6] but numbers of admissions are steadily increasing.[7] The four-hour target (time to treatment or discharge from hospital arrival) has decreased waiting times, but concerns remain, particularly regarding incomplete assessments, increased

admissions due to difficulty in discharging patients within this time frame and inappropriate patient moves.[8,9] The workload is not only affected by new patient admissions, there are also increasing rates of same-day discharge from acute medical units (AMU) and increasing numbers of ambulatory care conditions (for example, deep vein thrombosis and cellulitis) managed by out-patient attendance at AMU.[3]

Medical registrars throughout England identified interactions with emergency departments (ED) as a key area where they were heavily involved in patient flow, but their ability to do this optimally was often impeded.[1] Medical registrars reported that ED junior doctors are increasingly referring to them for a senior opinion as to whether to admit or discharge a patient instead of their own department seniors. As such, registrars spend less time in the AMU and many spend entire on-call days in the ED trying to avoid inappropriate or unnecessary admissions.

In order to do this effectively, registrars require a good understanding of what additional support services are available. However, this information is not always made clear to registrars in new hospitals during induction processes. Many registrars reported that a lack of infrastructure in ED often makes discharging patients directly more difficult than admitting to the AMU. Clearly when registrars are unable to be present in the ED due to demands elsewhere in the hospital, depending on the experience of those taking referrals, inappropriate or unnecessary admissions may occur more frequently. Once patients are admitted there are additional expectations of the medical registrar to provide senior review. In reality, many registrars report spending a large proportion of their on-call shifts clerking patients straight off because of the sheer volume of admissions. As a consequence, senior review of patients who may be dischargeable are prioritised below review of the critically unwell or medically complex. Some hospitals have blanket policies that the medical registrar must review all patients before they can be moved out of the AMU. This places a large workload pressure on medical registrars struggling to fulfil all of their other clinical priorities. During night shifts it is particularly common for medical registrars to be asked to review inpatients on the AMU to decide whether they are safe for transfer to outlying wards when pressures are mounting to

create bed capacity. This is a practice that, in general, medical registrars felt quite uncomfortable with when patients were unknown to them and often outlying beds were not felt to be of sufficient acuity, raising concerns about patient safety. Most registrars felt that, wherever possible, decisions regarding appropriateness of ward transfers, de-escalation of care and outlying patients should be made by teams who knew the patients during daylight hours.

Current inpatients are increasingly frail and complex.[10,11] More than 65% of people admitted to hospital are over 65 years old[12] and frail older patients require extra time and experience to ensure thorough assessment and appropriate care.[13] The medical registrar also receives increased referrals from other specialties and manages greater public expectation of aggressive medical intervention.[3] Further pressure comes from reduced continuity of care and the loss of a team-based structure due to the European Working Time Directive,[1,2,14] which also decreased the level of competence of more junior doctors. The medical registrar is increasingly called upon for practical procedures (e.g. lumbar puncture), which would previously have been carried out by sub-registrar grade doctors.[1]

In addition to performing practical procedures, there is also a responsibility and necessity to teach more junior doctors practical skills. This requires time and is yet another competing pressure on the stretched role of medical registrar. Furthermore, the current generation of medical registrars have less experience themselves and are potentially less well equipped to deal with the pressures of the role compared with those trained even just a few years previously.

REGISTRARS: OUR FINDINGS

We also surveyed current geriatric medicine trainees in the South-East of Scotland Deanery in May 2013 (email questionnaire to 23 registrars, with 12 responses). We found that issues raised locally closely mirrored the national Royal College of Physicians report. The most commonly reported pressure was simultaneous and competing demands for attention from different (often several) areas of responsibility, e.g. having to decide if patients are appropriate (or 'well enough') to 'board' to other areas in the hospital, answering phone calls from GPs and A&E, clerking patients and practical procedures, while also urgently needing to review unstable or deteriorating patients, both in AMU and the rest of the hospital, including patients in critical care units. The importance of early senior (registrar-level and above) review of deteriorating patients has been underlined by the 2012 NCEPOD report *Time to Intervene?*,[15] but registrars are increasingly less able to provide this due to the mounting workload in other areas.

Registrars also reported a further pressure affecting their ability to work effectively was covering 'hospital at night' shifts on sites where they may not have worked (or do not work) during the day with a resultant lack of familiarity with the patients, the team or the hospital layout. The 'hospital at night' system has improved some measures of out-of-hours patient outcomes.[16] In general, there is positive feedback from registrars,[1] but a common theme reported by registrars in the south-east of Scotland is still the pressure and time taken up by decisions regarding the movement of patients and lack of appropriate beds to move patients to at night.

Our survey identified low morale levels among registrars relating to their acute medical on-call work, characterised by a perceived lack of respect (especially from other medical specialties), inadequate rest and unreasonable demands. This is concerning, given evidence suggesting that good team morale is vital for patient safety.[17]

CONCLUSION

In summary, there is clear evidence of multiple pressures on the medical registrar, which have adverse impacts on patient care. Medical registrars have some key skills that enable them to support patient flow within an acute hospital, but competing pressures and clinical priorities do not always allow them to fulfil this role optimally. Some of the pressures are generic to the current climate of acute medicine and others are specific to the role of the medical registrar.

The combination of rising numbers of increasingly frail, complex patients, fewer hospital beds, diminishing training opportunities and difficulty in recruiting medical registrars may yet result in crisis, if medical registrar 'workhorses' are unable to cope with increasing demand and pressure on their role. The necessary solutions (although not discussed here) will be complex, but we would strongly advocate the involvement of medical registrars and other junior doctors in decision-making for the future.

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Acute pressures: perspectives from nursing

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INTRODUCTION

The NHS appears to be facing a perfect storm of year-round pressures. This picture is emerging from current opinion expressed by a range of practitioners and political commentators and in the media. Over the past year, the Royal College of Nursing (RCN) has been monitoring the many pressures building up within the NHS, because of concerns about staffing on hospital wards and the capacity to deal with patient demand and patient flow. In 2013, the RCN in Scotland conducted a member survey of nurses working in an acute hospital environment, with responses from more than 950 nurses who provided their perspectives from nursing. The experiences of staff working at the front line of care should inform current debate to shape the future care experience of patients admitted to acute care.

INTERCONNECTED PRESSURES

The pressures facing the health service include demographic change, acute pressures beyond winter, patient flow, management of waiting lists and planning a workforce that is able to deliver quality, person-centred care in the midst of these pressures. All of these issues are interconnected, and to find solutions it will be necessary to look at the whole system.

The RCN Scotland 2013 survey found that nine out of ten nurses working in NHS hospitals (89%, 717 respondents) reported experiencing pressures on beds all year round and eight out of ten (80%, 646 respondents) reported experiencing pressures on patient flow between wards, departments or units all year round. A total of 63% (595 respondents) reported that the severity of illness/condition of individual patients had increased compared with the previous year, and 69% (614 respondents) reported that the length of time needed to meet clinical need of individual patients had increased. The impact suggests that these nurses are experiencing pressures on delivering services to patients.

INCREASING PRESSURES IN OUR HOSPITALS AND PATIENT FLOW

Acute pressures are set against a backdrop of a reducing acute sector across the UK. For example, in England the average daily number of available general and acute beds open overnight has decreased by 25% from 2001 to 2012.[2] This capacity decrease is in contrast to increasing emergency admissions, up 37% in the same period, with over 85-year-olds representing an ever larger number of bed days – currently 25%.[3] In Scotland the average

available staffed beds across all specialties dropped 28% between 2001 and 2013, while emergency admissions rose by 14% between 2002 and 2012.[4] Since the beginning of winter 2012 Scottish media have reported increasing pressure on patient flow. RCN members in Wales reported in 2013 that pressure that was traditionally seasonal is now experienced year-round and this was contributing to lengthy waits for appropriate clinical areas to place patients.[5] In Northern Ireland there has been a 38% increase over the past two years in the numbers of patients waiting more than 12 hours for treatment and admission or discharge in emergency departments.[6]

The RCN Scotland 2013 survey found that 71% (599 respondents) reported that average bed occupancy had increased where they work compared with the same time a year earlier. More than half (56%, 495 respondents) reported an increase in the average length of time patients stay in the ward/department/unit, while a fifth (17%, 148 respondents) reported decreased average length of stay.

Although historical data from ISD Scotland show that the number of acute specialties beds has usually increased in the winter months, ISD Scotland commented that the increase from 16,076 to 16,538 between December 2012 and March 2013 in NHS Scotland was greater than in previous years.[4]

In the RCN Scotland 2013 survey, 15% of hospital nurses (134 respondents) reported that the number of beds in their ward had increased over the past year, with the majority of this group reporting that these additional beds were still in use (86%, 108 respondents). Nurses reported that additional beds have been in use for periods from up to one month to more than six months. Three quarters of those reporting additional beds (76%, 101 respondents) reported that nursing staffing in their ward/department/unit had not increased to care for the patients in these additional beds, and 94% (119 respondents) reported that medical staffing had not increased.

The Registered Nurse Forecasting (RN4CAST) project, one of the largest international studies ever undertaken to inform policy on the nursing workforce, has studied how features of hospital work environments impact on patient outcomes, nurse recruitment and retention. The RN4CAST has found that in European hospitals, after adjusting for hospital and nurse characteristics, each additional patient per nurse increased the odds of

T Fyffe

nurses reporting poor or fair-quality care and poor or failing safety grades, and that patients in hospitals with higher ratios of patients to nurses were less likely to rate them highly or recommend them.[7]

Audit Scotland's waiting times report[8] and headlines about pressures on beds, patients being moved from one ward to another or having to wait on trolleys for treatment all raise important questions about whether we have enough staff, beds and resources to provide high-quality, safe and effective care for Scotland's patients today, let alone tomorrow. More than half of those responding to the RCN Scotland 2013 survey (57%, 531 respondents) reported an increase in patients who were 'boarding' (waiting for a bed in another clinical area), compared with the previous year. Of respondents who were working in an inpatient ward, excluding receiving and assessment units (579 respondents), 60% (346 respondents) reported that on their last shift there had been one or more patients in a bed in their ward waiting for a bed in another clinical area in the hospital.

Discharge from hospital was also an issue of concern to those responding to the RCN Scotland 2013 survey, with 76% (585 respondents) reporting an increase in delayed discharge compared with the year before.

THE CARE OF PATIENTS IN INAPPROPRIATE CLINICAL AREAS

Capacity pressures are making the placement of patients in inappropriate clinical areas another concern for nurses. RCN members voted at Congress 2012 to support a call for an end to the practice of placing patients in inappropriate clinical areas in a debate on corridor wards. However, it is clear that the problem varies across the UK and includes:

- The care of patients in areas not designed as inpatient bed spaces, e.g. in corridors or overnight in beds designed as day-time capacity, at times compromising safety and dignity.
- The care of patients in areas not equipped or staffed for the specialist monitoring and interventions required for their condition.
- The placement and movement of patients between wards and specialties during a hospital stay for reasons other than outcome-related requirements.

Almost three quarters of RCN Emergency Care Association members surveyed in 2013 (190 out of 264 respondents) have seen patients placed in inappropriate clinical areas.[9] The Royal College of Physicians report some medical admissions being moved up to five times during a hospital stay and that patients moved may not have consultants taking overall responsibility of their care.[3] A quarter of those responding to the 2013 RCN

Scotland survey who worked in inpatient wards (26%, 152 respondents) reported that, on their last shift, patients who were appropriately cared for in their ward were moved to an inappropriate ward not equipped or staffed for the specialist monitoring and interventions required for their condition.

Nurses responding to the RCN Scotland 2013 survey reported concerns of patients waiting in day rooms, treatments rooms, corridors, chairs, on trolleys, examination couches and other areas while waiting for a bed in their ward/department/unit. A total of 35% (298 respondents) reported that, on their last shift, patients were not in a bed but were waiting in their ward/department/unit for a bed in their ward/department/unit.

Moreover, 35% (331 respondents) reported that in the past year patients where they work had experienced assessments in an area not designated for clinical care, while 26% (245 respondents) reported patients had received treatment in an area not designated for clinical care. A third (34%, 318 respondents) reported patients had waited for transfer to another ward/department/unit in an area not designated for clinical care and 40% (375 respondents) reported that patients had waited for discharge in an area not designated for clinical care.

THE UNINTENDED CONSEQUENCES OF TARGETS

Audit Scotland has reported that waiting time targets appear to have placed capacity pressures on the NHS: 'Better use of the available information… could have also identified wider pressures that were building up in the system around the capacity within NHS boards to meet waiting time targets.'[8] Audit Scotland has highlighted how inadequate the waiting times management systems have been in supporting timely, equitable and transparent access to our healthcare system. It is therefore important that the management of waiting lists is not considered in isolation, but in conjunction with all the pressures facing the health service.

UNSCHEDULED CARE

Current experiences of nurses are that there are not enough staff, beds or resources within the system and in the right places to deal with the increasing numbers of patients attending accident and emergency departments. The unscheduled care action plan announced by the Scottish Government[10] will require more nurses and allied health professionals as well as A&E consultants, and additional resources across all settings. Scottish Government and health boards need to reconsider the number of staff and resources in place now, as well as the capacity and capabilities of staff, and what will be needed in the future, if this action plan is to work.

This presents opportunities to build on the positive contribution that advanced practice nursing roles make to patient care and patient experience outcomes. It also serves to determine what clinically based education programmes need to be in place to ensure that these roles are sustainable and complementary to the multi-professional workforce. With an ageing registered nursing workforce (35% of current NHS Scotland nursing staff in post are aged 50 years and above[11]), it is vital that sufficient pre-registration student intake places are planned to ensure appropriate numbers of registered nurses for the future.

COMPLEXITY OF CARE

The success of enjoying a longer life is often accompanied by the reality of living with one or more health conditions. The King's Fund has stated that those with physical long-term conditions are two to three times more likely to experience mental health problems, which can increase total healthcare costs by at least 45% for each person.[12] Increasing numbers of patients with dementia are also a reality across the acute sector, with, for example, 69% of those responding to the RCN 2013 survey (539 respondents) reporting an increase in patients with dementia at their workplace over the past year.

The prevalence of multi-morbidity (individuals living with two or more health conditions) increases with age and is present in almost 65% of those aged 65–84 and in more than 80% of those aged over 85.[13] Care required for older people with escalating health needs, often requiring multiple treatments, can therefore be highly complex. There is a rapidly growing section of society called the 'fourth generation', those in their mid-80s or over, many of whom are frail as well as elderly. Age UK has commented that more evidence is needed to understand their healthcare needs – when people from this generation go into hospital, they are likely to stay in hospital longer and require treatment from clinicians who understand their complex healthcare needs.[14]

PLANNING SERVICES FOR THE FUTURE

Between 2010 and 2035 the number of people over 75 in Scotland is projected to expand by 82%.[15] The sheer rise in expected numbers of people living into older age with health and care needs will place both capacity and financial pressures on health and social care services. The Scottish Government has stated that, if there is no change to the current model for the provision of health and social care and demand rises as the older population increases, 'we would require an annual increase in investment in health and social care services alone of £1.1 billion by 2016'.[16] Clearly, given the current economic position, continuing with current models of care is not a viable option. The Cabinet Secretary's

comments in April 2013 that 'we are still going to need the same number of beds, the same number of hospitals, the same number of doctors and nurses just to stand still'[17] reopens the debate on the sustainability of current healthcare planning assumptions. With the added pressures associated with multi-morbidity, there is an urgent need to reassess how we plan services now and in the future.

WORKFORCE PLANNING

The future workforce will need to evolve to meet anticipated needs, as well as the policy direction for acute and unscheduled care, and to shift the balance of care and integrate services. Assumptions of need, clinical complexity and dependency on which workforce plans and the development of clinical roles are based must be as robust as possible.

A realistic workforce strategy should address the development of workforce capacity and clinical capability to deliver services to a population with increasingly complex needs across the full pathway of care. As yet succession planning for advanced and specialist nursing roles has not been adequately reflected in local NHS board workforce plans, despite clear evidence that specialist nurses provide highly effective, safe and cost-effective care.[18,19] Neither have we seen the effective joining up of medium- to long-term joint planning for the wider clinical workforce, for example between the nursing and medical workforce. The future delivery of health and social care in Scotland will require a truly joined-up approach to workforce planning, professional development and culture change across professions and sectors. Only with increases in capacity and resources can planned major developments in the way patient care is delivered be achieved.

CONCLUSION

There is no easy answer to the problems facing the acute sector. This requires a consideration of the acute, community and social care sectors and their interdependencies. We have to address both the patient flow factors, such as boarding, delayed discharges, waiting times and care in appropriate places, and make sure that we have enough staff with the right skills, beds and resources in the right place, at the right time, to deal with increasing demand from more people who are living with increasingly complex health conditions.

The contributing factors need to be acknowledged, quantified and tackled. A severe capacity crisis within an outdated model of acute care is stopping nurses and the wider healthcare team from delivering the care they aspire to deliver in the appropriate clinical area for the patient. The complexity of issues requires a similarly

complex debate and a response that will require the NHS, Scottish Government, local authorities and all other healthcare providers to work together to come up with solutions that will meet the needs of our population.

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Multi-disciplinary teams for better patient experience and clinical outcomes: the context of providing a multi-professional approach

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INTRODUCTION

The importance of the multi-disciplinary team (MDT) in providing high-quality, patient-focused care to acutely unwell patients has been recognised since the inception of acute medicine. The Royal College of Physicians of London's (RCPL) guidelines for acute medicine, Acute medical care: the right person in the right setting – first time, made explicit the necessity of MDTs based in acute medical units (AMUs) to provide initial comprehensive assessments of patients and their needs, particularly with regard to the care of the frail elderly.[1] These assessments are viewed as being vital to ensuring high standards of nursing and medical care, safe-guarding patients and promoting earlier and appropriate discharge from hospital.

The centrality of the MDT to acute care was reinforced by the Royal College of Physicians of Edinburgh's (RCPE) UK consensus statement on acute medicine in 2008, with multi-professional working stated as being a key principle for the effective care of patients and future development of acute medicine.[2] The RCPE further recommended that AMUs have their own dedicated pharmacy, occupational therapy and physiotherapy staff, all of whom are competent or have received training in acute medicine. AMUs should also have 'timely support… from other services including social work, psychiatric and alcohol liaison and critical care outreach'.

These recommendations were subsequently incorporated into NHS London's adult emergency services standards, which mandate that all emergency inpatients must have 'a clear multi-disciplinary assessment' undertaken within 12 hours of admission and that all complex-needs patients must be promptly screened by a multi-professional team, including pharmacy and therapy services, seven days per week.[3] More recently, the RCPL's Acute care toolkits on High quality acute care[4] and Acute medical care for frail older people[5] have pointed to the broadening of roles for the MDT in the acute setting with regard to the risk assessment of patients for alternative forms of care, the facilitation of early discharge, comprehensive medication review and the planning and co-ordination of the seamless, integrated care of patients. Of these, risk assessment and early discharge have subsequently been identified as two of the three most important priorities in relieving the pressures on urgent and emergency care services in the joint submission from the RCPL, the Royal College of Emergency Medicine, the Society for Acute Medicine and the NHS Confederation to NHS England's Urgent and emergency care review.[6]

This article will review the literature supporting the key contributions of the individual members of the traditional multi-professional team (pharmacy, physiotherapy, occupational therapy), look at the lessons from complex interventional studies, survey the promoters of and barriers to good MDT working and then discuss the potential benefits of moving from multi-disciplinary to inter-disciplinary team structures.

HOW MULTI-DISCIPLINARY TEAM MEMBERS MAKE A DIFFERENCE TO CARE

Pharmacy services

Transitions of care are a high-risk period for patients with regard to medication safety, particularly at the point of admission to and then discharge from hospital.[7–9] Reviews of acute admissions have found that up to 7% are directly related to prescribed medications,[10] while approximately one third of elderly patients presenting to hospital with acute illnesses are taking one or more inappropriate medications.[11] Up to 50% of patients have a medication error made at some stage during an acute admission, with a further 20% of patients experiencing an error at the time of first follow-up by the general practitioner.[12]

These findings are, perhaps, unsurprising, when considering that the majority of UK first-year foundation doctors (FY1s) do not consider themselves to be 'competent to prescribe'[13,14] and that only a small fraction of acutely admitted patients have accurate and complete drug histories taken by junior doctors.[15] While many of these medication-related problems (MRPs) are not clinically significant, others are a major contributor to unnecessary patient deaths, adverse drug events (ADEs), increased lengths of stay (LoS) and hospital re-admissions.[16–18]

L Vaughan, A Mitchell

Medication reconciliation (MR), the formal process for identifying and correcting unintended medication errors across transitions of care, was mandated at the point of admission in the UK by the National Institute for Health and Clinical Excellence (NICE) and the National Patient Safety Agency (NPSA) in 2008.[19] It is expected that similar guidance will be issued on MR at discharge in the near future.

A recent review of strategies to improve MR found that pharmacist-led interventions led to clinically significant reductions in unintended medication errors in 'high-risk' patients, preventable ADEs and re-admissions and emergency department attendances.[20] Only one study was found to have performed a cost-based analysis of MR, but this robustly suggested pharmacist-led MR is highly cost-effective.[21] The evidence suggests that pharmacists in AMUs have benefits beyond those resulting from mandatory MR. The presence of pharmacists on ward rounds has been shown to prevent ADEs,[22] while the only study of pharmacists on AMU rounds found that specialist acute pharmacists contributed to the choice and dosage of therapeutic agents for nearly all patients and intervened to stop medications resulting in ADEs in 12%.[23] Admissions pharmacists have also been found to reduce medication risk by detecting potential errors prior to medication administration, while improving the timeliness of medication supply.[24] Studies set in American emergency departments have found that pharmacists improve the accuracy and quality of patient drug histories and reduce medication-related errors in the order of 10–13-fold.[25,26]

NICE also recommends that medicines review should be undertaken on a regular basis with a view to educating patients and improving medication adherence.[27] While this recommendation has been issued with a view to general practice, the relatively high frequency of inappropriately prescribed medications and the unmet need that patients have for information regarding medication suggest that medication review might also be highly valuable in the acute setting.[28–32]

Physiotherapy and occupational therapy

It is should be acknowledged that physiotherapy (PT) and occupational therapy (OT) are separate professional and academic disciplines. However, PT and OT have complimentary and highly allied skills for the assessment and evaluation of patients for rehabilitation and discharge. Further, many interventions are described in the literature as being 'therapies-led' or as being shared between PT and OT, rather than belonging wholly to a single discipline. For this reason, the evidence surrounding PT and OT in the acute setting will be jointly, rather than individually, considered.

Functional decline is a major risk factor in older patients (>65 years) presenting with acute medical illnesses and is the main determinant of subsequent quality of life, cost of care and prognosis.[33–35] Around 30% of older patients will experience a decline in activities of daily living (ADLs) during an acute admission and 60% decline within three months of discharge. Of those patients discharged with a new ADL disability, around 40% will die within 12 months.[36] The literature on the effect of exercise in the hospital is difficult to interpret. There have been few well-constructed comparative studies on what types of activity best suit certain types of patient and studies often lack clarity when describing the exercise intervention.[37] This is reflected in the Cochrane review of the effect of exercise on functional status in acutely unwell hospitalised patients being able to include only nine out of 3,138 screened articles.[38] This review did not find any consistent improvements in the main outcome of functional status. However, interventions involving individually tailored programmes, with a short lead-in time to commencing the intervention (within 48 hours of admission) have been shown to be effective in improving functional scores, decreasing the likelihood of referral for nursing home admission and shortening length of hospital stay.[39–41]

Therapists also play a key role in the process of discharge planning. A Cochrane review noted that the evidence is strongest for discharge planning processes that involve individualised patient assessments by therapists, which has been found to result in reductions in hospital LoS and re-admission rates and improved patient satisfaction.[42] However, the review concluded that the impact of discharge planning on mortality, other health outcomes and cost remains uncertain. Other individual studies have shown that home visits can be particularly helpful in developing discharge plans and can improve patient autonomy.[43]

Falls in hospitals and other care facilities are a common cause of iatrogenic harm in older patients.[44] The Cochrane review of interventions to reduce falls in hospitals identified only 17 trials, of which only four were conducted in acute wards.[45] Multi-factorial approaches reduced the rate of falls and the risk of falls, although the review concluded that more trials were needed to confirm these findings. These results are not particularly surprising, given that meta-analysis of approaches to reduce falls across settings concluded that a 'dose' of at least 50 hours of tailored exercise is necessary to reduce falls.[46]

HOW MULTI-DISCIPLINARY LIAISON SERVICES MAKE A DIFFERENCE TO CARE

Liaison mental health services

The evidence for liaison mental health services (LMHS) is well established. A review of 48 papers published between 1975 and 2001 concluded that although there were significant methodological flaws in many of the studies, there was sufficient international evidence to conclude that LMHS based in acute areas, particularly accident and emergency departments, eases the burden on staff, helps clients to access appropriate services and reduces re-admission rates of people with mental health problems.[47] There was little evidence to support any model of service configuration over any other and other review articles have commented that the large gaps in the evidence mean that LMHS services cannot simply be packages of the individual interventions that were shown elsewhere to be effective.[48,49]

Similar results have been found with regard to the effectiveness of old age psychiatry services in the acute setting. A review from 2000 found that the majority of studies found that services were associated with positive acute treatment outcomes, particularly in patients with depression.[50] The review also noted that carers often have unmet needs that require addressing. An updated review from the same authors noted the ongoing paucity of high-quality studies, but concluded that there was consistently positive, albeit low-quality, evidence that old age psychiatry services are effective.[51] This has led to the Royal College of Psychiatrists and the Department of Health (DoH) to recommend that mental health care for older patients should be available in the acute and general hospital settings.[52,53]

More recent international studies have noted the shifts in patterns of referrals to LMHS, with an increased referral rate and a shift away from younger suicidal patients towards older, sicker patients.[54] Two retrospective analyses from UK hospitals support these findings, with growing numbers of referrals being made for assessments for mental capacity, especially with regard to discharge planning and complex social issues, and cognitive assessments for dementia.[55,56] While these findings reflect the impact of the introductions of the Mental Capacity Act[57] and the National Dementia Strategy,[58] they also underline the importance of timely access to skilled LMHS, especially those catering to older patients.

Alcohol and drug liaison services

Hazardous use of alcohol is a common cause of acute admission to hospital and a major source of patient harm.[59,60] The published literature on specialist alcohol interventions is mixed. Although the evidence to support services based in emergency departments is substantial,[61,62] a 2006 review article concluded that the evidence for interventions delivered to higher-risk patients admitted to hospital is less robust.[63] Regardless, NICE guidance on commissioning interventions for problem drinkers advocates the use of alcohol health workers or alcohol liaison nurses.[64] This is supported by two recent UK studies. A study conducted in Greenock, Scotland, found that rates of completion of alcohol rehabilitation were more than twice as high following the introduction of a specialist alcohol liaison service to general medical and surgical wards.[65] A Nottingham-based study over five years found a reduction in hospital admissions, primary care attendance and violent incidents against staff after setting up a similar service.[66]

Rapid response systems

Failure to recognise and respond to the deteriorating patient leads to avoidable intensive therapy unit (ITU) admission, excessive consumption of resources and unnecessary patient deaths.[67–9] National Confidential Enquiry into Patient Outcome and Death (NCEPOD) reports have consistently found that nearly 70% of patients have clearly identifiable gross changes in their physiology for greater than 12 hours before referral to ITU or cardiac arrest.[70,71] Similar studies from overseas also note the excessively long periods of time that elapse between the first signs of deterioration and appropriate intervention.[67–69]

Rapid response systems (RRS), which include the use of early warning scores (EWS) to detect deteriorating patients and critical care outreach teams (CCOT) and medical emergency teams (MET) to respond to them, have been introduced internationally to support critically unwell and deteriorating patients.[72] Despite a number of promising studies,[73–5] repeated reviews and meta-analyses have failed to detect consistent benefits to the introduction of CCOT/MET teams.[76–8] Other studies have pointed to complexity of RRS interventions and multiplicity of contingent factors, such as organisational culture, leadership and the attitudes and knowledge of individual staff members, that impede the effective introduction and subsequent use of RRS.[79–81] Regardless, reviewers have concluded that RRS is the best way, in the absence of alternatives, to respond to deteriorating patients.[77,78] Although EWS and CCOT/MET teams are nearly ubiquitous in UK hospitals,[82] the literature would strongly support the adoption of the National Early Warning Score (NEWS) in place of any existing EWS and suggest that attention be paid to local team structures and systems, hospital organisational culture and staff education in order to maximise the effectiveness of RRS, particularly with regard to the provision of services to high-risk areas such as the AMU.[83]

L Vaughan, A Mitchell

Palliative care liaison services

Multiple international observational studies have highlighted the extremely poor provision of end-of-life care in acute wards, with the majority of patients experiencing distressing, poorly managed symptoms before death.[84–6] The Liverpool Care Pathway was developed in response to these findings on the principles of hospice care.[87] Although subsequently recommended by the DoH and NICE,[88,89] it was recently withdrawn after review by Julia Neuberger.[90] Neuberger's report underlined the lack of evidence regarding the care of the dying patient, a finding backed by the academic literature. The Cochrane Group failed to find a single eligible study for inclusion in a review of end of care,[87] while other authors have also noted the significant methodological and ethical problems with studies involving the dying patient.[91,92]

Still, a small number of studies have found that palliative care liaison services can improve the quality of care that patients receive.[93,94] A systematic review of factors supporting good partnerships between generalist and specialist palliative care services identified the need for appropriate and timely access to specialist palliative services and co-ordinated care, as well as good communication between teams and clear definitions of roles and responsibilities when caring for dying patients on acute and general medical wards.[95]

Social work

Of all of the MDT and liaison services, the least evidence exists to support social work services. There is only a single published review of social work, which noted that of the 44 peer-reviewed articles found, only five studies were interventional.[96] However, British governmental reviews have pointed to the impact of limited or inefficient discharge planning, poor communication between agencies and the failure to provide adequate social services on delayed discharges.[97–9] This resulted in legislation being passed that introduced legal obligations of co-operation between differing sectors of health and social services and incentives to foster inter-agency working.[100]

Despite this, the provision of social work services remains poor, insufficient or unco-ordinated.[101,102] One study noted that the ability of an otherwise successful MDT was significantly impeded by the repeated failure of social workers to attend MDT meetings.[101] Unsurprisingly, up to one third of patients experience delays in transfers of care as a result and these delays are associated with substantial additional hospital stays (average 4.84 days), new acute illness episodes and death.[103]

These findings would suggest that social workers should be integrated as closely as possible into the acute care setting.

LESSONS FROM COMPLEX INTERVENTIONAL STUDIES

The real complexity of delivering quality patient care has been increasingly acknowledged, with a concomitant shift away from studies of single interventions towards the use of two new parallel approaches. The first is a 'comprehensive' approach to patient care, predicated on the development of broad, personalised plans for each individual patient.[104] The 'care bundle' approach, alternatively, aims to deliver a specific number of proven interventions to every patient and often includes a 'check-list'.[105] Both of these depend on multiple interventions being delivered, usually by several different members of staff. As such, both of these approaches are often implicitly dependent on the MDT.

Newer interventions for older patients have relied on the former approach, with the acute care for elders (ACE) and comprehensive geriatric assessment (CGA) models having been trialled internationally. The ACE model was designed to help patients maintain or achieve independence in ADLs through the combined effect of four key elements: a specially designed environment, patient-centred care, discharge planning and medical care review, which included daily consultant review and protocols to minimise interventions and medications.[106] The original randomised study found that the intervention improved the functional status of patients and decreased the number of patients being discharged to long-term care institutions, with a trend towards shorter LoS.[106] Recent meta-analysis concluded that acute geriatric unit care results in substantially better outcomes for patients, including less functional declines and shorter LoS.[107]

A systematic review, by the same authors, found that the implementation of specific components of the ACE model outside of a dedicated acute geriatric unit also produced positive outcomes for patients.[108] The evidence was strongest for daily comprehensive medical review, early rehabilitation and patient-centred care. Early discharge planning was not found to affect LoS directly, but still appeared to influence discharge destination, while a prepared environment resulted in less delirium, but did not result in reductions in LoS or change in discharge destination.

Comprehensive geriatric assessment is defined as a multi-dimensional, inter-disciplinary process for the co-ordinated, integrated assessment and care of the older patient.[109] A Cochrane Review of 22 studies concluded that patients who underwent CGA were more likely to be alive and living at home than patients who received usual care.[110] Subgroup interaction suggested that ward-based models were preferable to 'teams'.

Champions of the CGA approach have emphasised the need for it be delivered in its entirety. However, an

attempt to 'unpack the black box' of CGA suggested that an MDT was at the heart of successful interventions, with a core team of dedicated therapy staff, a senior physician, a co-ordinating nurse or specialist nurse and a social worker.[111] Studies that relied on service referrals were less successful. Regular patient review, regular team meetings, clear processes for assessing patients and protocols for the identification and prevention of problems such as pressure sores, delirium, necessary catheterisation, etc. were also associated with better patient outcomes. Specialist nursing care and prepared ward environments were assessed as being less critical to good care. The reviewers also noted the negative implications of conflicts between members of the interventional team and other staff.

Because comprehensive models of care, such as ACE and CGA, are highly resource-intensive and there is a relative shortage of experienced geriatricians, a number of American studies have explicitly attempted to deliver aspects of these models within a hospitalist service. Most of these involved daily ward rounds, an MDT approach to care, clear protocols for discharge and team training. While a review was unable to make comparisons and draw firm conclusions because of the heterogeneity of the studies, the adaptation of geriatric models of care to hospitalist services was judged as being a promising way of improving the quality of care for older patients.[112] A very recent study, where hospitalists conducted daily 'geriatric' assessments of patients and led an MDT on general medical wards, found a reduction in functional decline, delirium and discharge to institutional care, along with a shorter LoS of 0.7 days.[113,114]

An Australian group extended the comprehensive care model to all patients within interventional general medical wards.[115] Compared with the control wards, there was a reduction in mortality (6.4% to 3.9%), less functional decline and shorter LoS. The costs of the additional therapy and senior nursing staff required to deliver the intervention was found to be A$184 (per patient), costs considered to be more than outweighed by reduced mortality and more efficient bed usage.

Although the notion of 'care bundles' and 'check-lists' were initially trialled and tested in the surgical and intensive care settings, they are being increasingly used in the general medical setting to improve the delivery of complex interventions to patients.

The re-engineered discharge (RED) programme consists of 11 interventions, including medication reconciliation, patient education and proactive discharge planning, designed to minimise hospital use after discharge. The original study noted a significant reduction in rate of emergency department re-attendances within 30 days of discharge.[116] The model has since been adopted

elsewhere in the USA, with reports of up to 50% reductions in hospital re-admissions.[117]

The introduction of a six-item discharge bundle in a London hospital for patients with chronic obstructive pulmonary disease reduced 30-day re-admissions from 16.4% to 10.8%.[118] There were also marked improvements in the delivery of individual components of the bundle, particularly post-discharge pulmonary rehabilitation (13.6% vs 68%) and the provision of individual patient management plans (54.6% vs 97.9%). Although this intervention was initially introduced in a specialist respiratory ward, the components were designed to be deliverable within a general medical setting.

Another group in London has used a novel adaptation of the bundle approach and developed a check-list for use on general medical ward rounds.[119] The 'ward safety check-list' offered prompts to consider patient risks, involve the MDT, clarify information and discuss key issues with the patient. The check-lists were perceived to have promoted patient safety and to have fostered better communication within the care teams.

Although the comprehensive and bundle/check-list approaches vary, the literature supports the contentions that they are highly adaptable and promote MDT working, while certain components appear highly suitable for transfer into the AMU context.

THE FUNCTIONAL MULTI-DISCIPLINARY TEAM

The MDT approach was first touted as a way of providing better patient care more than three decades ago, through the provision of better planned and more clinically effective services with a focus on the patient and their individual needs. It has been championed as the standard care with the NHS[120,121] and, indeed, has been a legal obligation since the early part of this century.[100] Both experience and empirical evidence, however, continue to point to the fact that assembling an MDT is substantially easier than subsequently having it work functionally and effectively. This partially accounts for the finding that many MDT-based interventions are unsuccessful,[122,123] while the handful of ethnographic studies of MDT working in the UK have found that most teams are neither effective nor actually function as MDTs.[124–6] One prominent research group commented that although working together to provide better outcomes for patients might be the ideal within the NHS, it was the exception rather than the rule.[127] While the real benefits of MDT working have been difficult to demonstrate, the consequences of their failure impact significantly on patients. Studies of unintended and adverse events show that most are due to either human or organisational factors, with failure to collaborate with other members of staff being a frequent cause for

L Vaughan, A Mitchell

events. Such events result in prolonged hospital stays, mental distress and physical discomfort to patients.[128–30] In the UK, the Francis report made painfully and abundantly clear the effects of teams at unit, hospital and organisational level failing to co-operate and communicate.[131]

The literature is exhaustive on the barriers to effective MDT working.[122–4] Of key importance are issues around professionalism and relative status, with MDT working in itself representing a threat to professional identity and autonomy and leading to confusion about roles.[132,133] Different professions/disciplines also have differing goals for patient care and different perceptions of what constitutes acceptable risks to patients, leading to disagreement among team members around the formulation of plans for patients.[134,135] Alongside this, different disciplines value certain skills more highly than others, which can lead to poor communication and be a perpetual source of a conflict among team members.

These issues are particularly emphasised in team meetings, where unofficial hierarchies tend to be adopted, with status being accorded by level of medical knowledge.[135] This often leads to nurses and other non-clinical staff becoming reluctant to contribute to meetings, particularly if the information is negative or non-medical in nature, for fear of being blamed for failures in patient care.[134–6] Individual team members can also stop taking responsibility within the scope of their own discipline, leaving all decisions to be 'sanctioned' by the MDT, which in reality means passively transferring all responsibility to the lead medical consultant.[137]

Other studies have noted that MDT team meetings can become places where team members 'compete to withdraw' from the provision of services, especially in the face of inadequate staffing or insufficient resources.[138] These findings account, at least in part, for the fact that even functional MDTs tend to be much better at assessing and planning than deciding and executing.[139]

Empirical research on how a dysfunctional team can be transformed into a functional one is extremely sparse. However, reviews of MDT working and ethnographic studies point to several factors that foster effective MDT working.[122–7] Most essential appears to be clear goals for the MDT, a shared understanding risk and of what constitutes good care, strong medical leadership (preferably with a single nominated consultant) and facilitation of communication. A shared working environment, the presence of all members of the team at regular meetings and unified documentation all foster good communication and healthy interpersonal relationships.

The literature also demonstrates the importance of the local organisational culture in establishing and maintaining successful teams.[140–2] As was first noted nearly 30 years ago, contamination of the team's goals with service demands (such as closing hospital beds), failure to support staff, lack of managerial commitment and the withholding of funds guarantee the failure of even highly functional and motivated teams.[143]

FROM MULTI-DISCIPLINARY TO INTER-DISCIPLINARY

Although the terms 'multi-disciplinary', 'multi-professional' and 'inter-disciplinary' are all used almost interchangeably, they actually represent teams across a spectrum of collaborative working arrangements.[140,144] Arrangements based on 'professions' (i.e. registered doctors, nurses, pharmacists and allied healthcare workers) tend to be narrower than those based on 'disciplines', which can also include non-professional members of healthcare teams, such as healthcare assistants, medication technicians, physicians assistants, lay workers and volunteers. 'Multi-disciplinary' arrangements, although they depend on a high degree of co-operation and collaboration, still tend to preserve disciplinary boundaries, with other members of the same team often having little or no idea of the working practices of their colleagues.

Inter-disciplinary teams (IDTs), alternatively, recognise the core expertise of each profession, but pool and blend knowledge, skills, resources and responsibility across disciplinary boundaries. Theoretically, it offers significant benefits over MDT arrangements by encouraging co-operation, building the skill set of the whole team, breaking down professional barriers and improving communication.[145,146] Where these teams exist, they have been shown to be extremely powerful and highly effective at implementing change and improving service delivery.[122,147] However, the literature suggests that true IDT working is extremely rare and that the barriers to and the problems posed by MDT working can be magnified by IDT.[122,123,137] Reviews of IDT reveal several recurrent themes in creating and supporting successful teams.[122–4,140,144] Team structure is a key theme. There should be sufficient team staffing to provide an appropriate mix of skills, competencies and personalities to meet patient needs and smooth team functioning. While larger teams often inhibit participation,[127] teams with higher levels of occupational diversity have been found to be more effective and far more radically innovative.[148] A strong leader, capable of articulating clear goals for the team, while supervising and supporting individuals, is considered another essential feature.

Team processes were also found to be important, including regular team 'business' meetings, shared work premises/office space, clear protocols, cross training of all team members in core skills, team-orientated education, unified paperwork and documentation, robust audit, recognition and reward of both individual and team successes. Reviews also repeatedly emphasised the importance of organisational and cultural factors in the creation of functional IDTs.

More subtle factors, such a team understanding of 'shared cognition'[149] and the promotion of role interdependence while respecting individual autonomy, have also been highlighted. Fundamental to all aspects of IDT working are those of stability and time. Teams of full-time staff who have been working together for long periods tend to be the most effective. Moreover, IDTs depend on high degrees of trust, respect, shared values and clarity of vision, meaning that it can take years of nurturing before teams reach maturity and maximal effectiveness.

It should be noted that a shift to IDTs may represent a solution to the problem of providing MDT services seven days per week as, by definition, core tasks do not have to performed by a specific professional discipline.

CONCLUSION

This review has found that there is a consistent, albeit methodologically flawed, body of evidence that supports MDT working in the acute medical setting. The literature, however, strongly suggests that effective MDT working cannot simply be mandated. Multi-disciplinary teams are also not a universal panacea for the problems of bed shortages and poor quality of care. Indeed, there is a suggestion that poorly functioning MDTs can worsen outcomes for patients.

The AMU appears in many ways to be an ideal place to foster effective MDT. Many of the keys to MDT working, such as daily ward rounds and shared working facilities, are inherent within the AMU structure. Many AMUs have strong leadership teams, clear lines of communication and well-articulated goals for patient care – ideal circumstances to support newly formed MDTs. Other units may already have the appropriate staff, making it relatively straightforward to introduce MDT-orientated processes such as medication reconciliation, proactive discharge planning, protocols for the avoidance of delirium, etc.

The AMU also poses unique challenges to MDT working. Multi-disciplinary teams require a high degree of stability, something not present in a workplace that relies on consultants working set rosters and all junior medical staff working shifts. Differing perceptions of acceptable risk levels by staff from different disciplines may be even more problematic than on standard medical wards. The general business of the AMU may also impede communication, especially with visiting liaison teams.

This review would recommend the following:
1. Social workers should be included as core members of the AMU MDT.
2. While MDT working should continue to be supported, IDT working should ultimately be considered to be the best standard of care.
3. The importance of effective MDT working, as opposed to the employment of a broad group of professionals on the AMU, should be emphasised.
4. The managerial and organisational underpinnings of effective MDT/IDT should be explicit; teams cannot be expected to be effective in the absence of appropriate staffing, funds, resources or support.
5. It should be noted that MDT working is enhanced by the adoption of specific processes, such as medication reconciliation, proactive discharge planning, risk screening, etc.

L Vaughan, A Mitchell

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An allied health professional perspective on patient flow in acute medicine

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INTRODUCTION

Patient flow is a complex process that involves specialists from many disciplines across primary, secondary and tertiary care. Focus tends to be on hospital admission, the front door, accommodating admissions in ward beds and the bottlenecks that this process creates. It is wiser to view the whole patient journey to understand fully how interventions can influence this pathway and influence a variety of potential bottlenecks (Figure 1). The World Health Organization (WHO) defines health as 'a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity'.[1] In recent years the emergency departments have, through the multi-disciplinary team (MDT), been considered the gatekeepers of admission to secondary care. Furthermore, the allied health professionals (AHPs) who focus on the mental, physical and social well-being of patients may be considered the guardians of safe discharge to the community and the preservers of quality of life and function.

This paper summarises the evidence to support the role of AHPs in the admission of acute patients, outlines the changing landscape that promotes the prevention of admissions as well as the journey through acute care, emerging post-acute care models and finally pulling into the community to ensure those patients are treated and maintained whenever possible in their place of residence.

HOSPITAL ADMISSIONS

Within the UK changing demography, reduced public sector spend and increasing complexity of patients are driving and shifting clinical models of care. The need to reform services and enable individuals to be cared for in their own homes or in a home setting and reduce emergency admission rates in the 75+ age group is a consistent theme in the devolved health sectors.

In 2011 a King's Fund data briefing highlighted the need to use beds in acute hospitals more efficiently to promote potential savings and deliver better care for patients.[2]

Across the policy spectrum in Northern Ireland, Scotland, England and Wales the drive to reduce bed days and promote care in the community has dominated service redesigns in recent years. Northern Ireland, Wales and Scotland have moved to an increased integrated model, with health and social care partnerships driving up seamless care and streamlining services to prioritise the needs of the local population.[3,4]

INTERMEDIATE CARE (PREVENTION OF ADMISSION)

Intermediate care is a collective term to describe a number of services that focus on maximising independence in the community, preventing admission and co-ordinating timely discharge from hospital.

The essence of intermediate care is multidisciplinary teams (ICT) working across sectors and boundaries.[5,6] Allied health professionals (health and social care) play a key role in assessing, co-producing and facilitating therapy intervention in the individuals' place of residence, which will foster independence and promote functional maintenance to enhance or maintain an individuals quality of life.

Services can include:
- Re-ablement
- Virtual wards
- Rapid response community teams
- Enhanced supported discharge.

There is a significant role for the occupational therapist and physiotherapist as well as community nursing, care assistants and general practitioners in achieving the goals of this type of service. The ICT largely work to a biosocial model that focuses on social maintenance of function to enable elderly individuals to stay at home.[7] The developing use of tele-healthcare and tele-monitoring has enhanced the possibilities for keeping older people safe in their own home environment and focusing on the prevention of deterioration and social needs, as opposed to the hospital model of intervention.[8]

Clinical examples

There are a number of common chronic conditions that act as a reservoir of acute admissions when the patients' condition deteriorates. Taking the example of patients with asthma who have previously required an emergency hospital admission, it has been shown in a randomised controlled trial that home asthma management by respiratory physiotherapists reduces hospital admission and the length of any subsequent admission in a

FIGURE 1 Whole system patient flow and opportunities for allied health professional interventions.
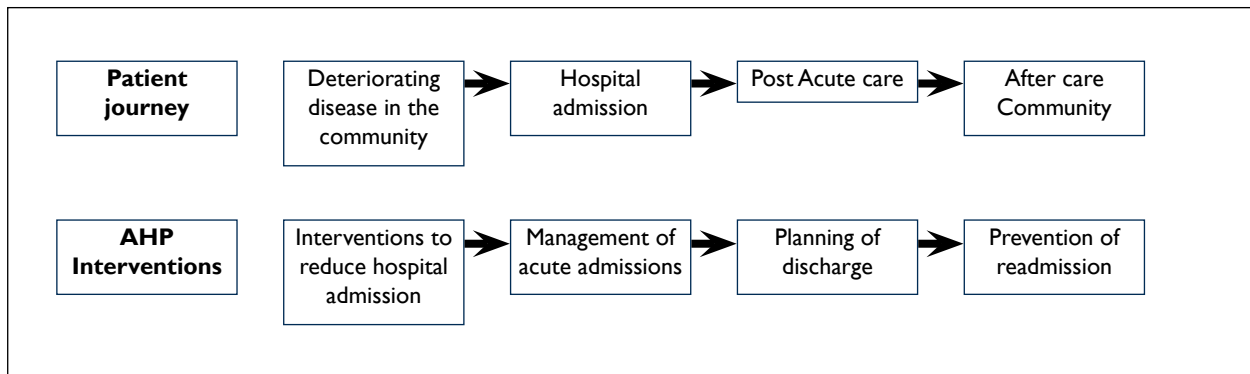
population prone to disease deterioration.[9] Similarly, a study on patients with chronic obstructive pulmonary disease on home oxygen demonstrated that home visits by respiratory physiotherapists reduced the frequency of hospital admission and improved patient understanding of their disease.[10] These studies provide evidence that community intervention by therapists in populations that are prone to disease exacerbation can reduce acute medicine admissions to hospitals.

ADMISSION TO HOSPITAL

When patients are admitted to hospital there are a number of areas where AHP intervention can influence patient recovery and discharge. A number of models have examined the benefit of placing a mixed professional AHP team at the front door (ED and medical assessment unit, MAU).

A systematic review of clinical effectiveness and safety of deploying AHP staff in ED looked specifically at physiotherapy.[12] The authors found 11 papers that had a high level of methodological bias. They concluded there was insufficient evidence that at a provider level there are benefits that suggest physiotherapy should be in ED. However, this finding is largely one of absence of evidence rather than evidence of absence. A prospective non-randomised controlled trial of primary contact versus secondary contact physiotherapy for soft tissue injury within an ED concluded no clinical difference in patient outcomes. However, a reduced length of stay in ED of 60 minutes and a reduced waiting time of 20 minutes were reported for primary contact physiotherapy?.[13]

A comprehensive outline of the role of occupational therapy (OT) in MAU describes the contribution, skills and competencies and value that having a OT team in MAU can achieve.[14] In 2008 the Royal College of Physicians of Edinburgh Acute Medicine Society endorsed that MDT approach within its consensus statement, including AHPs in its final paper.[11]

Allied health professionals in MAU have the potential advantage of identifying patients with needs and directing them to an appropriate care facility within the hospital.[15] The model of assessment of need and care delivered by the AHPs is a bio-psychosocial model. The assessment of frail, complex patients using the Comprehensive Geriatric Assessment (CGA) tool used by many AHPs in the MDT has been shown to be favourable for this growing group of patients coming into hospital. A meta-analysis of randomised controlled trials looking at the use of CGA in frail elderly admitted to hospital as an acute emergency showed that those in CGA cohort of patients were more likely to be living at home independently up to one year after admission.[16] In addition, the AHP contribution at this stage offers the potential for early recognition of therapy needs that may prevent delays in discharge once the patient's medical condition has improved.

ACUTE HOSPITAL STAY

Therapeutic intervention can also have a major influence on patient recovery.

Patients in intensive care who required mechanical ventilation were randomly assigned to scheduled reduction in sedation and physiotherapy and occupational therapy or physician lead therapy intervention. Patients assigned to scheduled therapy had a return to independent functional status in 60% of cases, compared with 35% in the control group. Interestingly, patients in the scheduled therapy group also had shorter episodes of delirium and more ventilator-free days during the 28-day follow-up period.[17]

POST ACUTE CARE

Following recovery there is an expectation that patients will be discharged home. Therapists are key individuals involved in successful discharge planning. A large study in an acutely ill population demonstrated that therapists discharge plans were followed in 83% of cases. However, when these plans were not followed, patients were

LN Douglas

almost three times more likely to require hospital re-admission.[18] Some patients will be discharged home with support from their primary care physician, but others require ongoing rehabilitation or support.

Planning discharge is a frequent bottleneck where the onus is put on assessment in hospital. While this is a practical location for assessment there is no reason why community-based therapists could not undertake the assessment of patients for discharge in hospital. There are obvious advantages of understanding community-based resources and continuity of care that this might offer – this is termed the 'pull' model. A large randomised controlled trial is currently under way to assess the economic and healthcare benefits associated with occupational therapy discharge planning.[19] Evidence for effective discharge planning is currently lacking and this study has the potential to provide important information that may shape healthcare planning and resources.

Once patients are discharged following an acute admission, evidence suggests that they are at higher than normal risk of re-admission to hospital. Resources in therapists are well spent and there is a direct correlation between numbers of therapists in nursing home settings in the USA and hospital admissions and even patient outcomes, including survival.[20] The same study also showed a clear cost benefit for having higher levels of registered nurse and therapist staffing. Keeping patients well at home or in a step down care facility is also an important therapeutic target for AHP intervention.[18,21,22]

BARRIERS TO PROMOTING FLOW

There is growing debate about whether appropriate timely care can be delayed by the lack of seven-day services within health and social care. A recent publication by NHS Improvement highlights several case studies that demonstrate the impact of different service models in providing seven-day services in a variety of settings and disciplines.[23] There are numerous examples of diagnostic (radiography) integrated rehabilitation and recovery (OT/PT) and social services that highlight how seven-day services have promoted admission prevention, early diagnosis and intervention and early supported discharge. Focused on improvement methodology, this publication provides a plethora of contacts and possibilities to share learning and promote spread in services across the UK.

CONCLUSION

The previous consensus statement from the Society for Acute Medicine promoted AHPs as members of the MDT in MAU. There is emerging evidence, including from randomised controlled trials, to demonstrate that AHPs play a vital role in maintaining patient flow and maximising benefit from new models of care for older people. The majority of these models are focused on a bio-psychosocial holistic model and pulling patients out into the post-acute care phase and onwards to intermediate care or re-ablement within the local community. There is considerable regional variation in the direction and pace of change in health services in the UK. The social and therapy needs of a growing and ageing population remain the same, and there is a need for closer integration to provide seamless care and flow with a clear a direction of travel for patients in all areas of the UK.

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Using multi-disciplinary teams for better patient experience and clinical outcomes: a pharmacist's perspective

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One of the key principles in improving patient experience is the delivery of high-quality, patient-centred care. The standard definition for quality care recognised internationally is that of the US Institute of Medicine which has six criteria: patient-centred, safe, effective, timely, efficient and equitable.[1] These criteria apply equally to the roles of all the members of the multi-disciplinary acute medical team. In this review the focus will predominantly relate to how the service design and infrastructure of medicines management systems impact the experience and patient flow of newly admitted patients to the acute medical unit (AMU).

PATIENT-CENTRED, SAFE AND EFFECTIVE CARE

The logical initial resource to determine how patients perceive an improved experience is the wealth of information provided by patient questionnaires. Analysis of more than five years of hospital inpatient surveys highlights support for self-care, involvement in decisions and comprehensive information provision as key continuing themes. Patients also want more information about their medicines and the side effects of their medicines throughout their hospital stay. Ultimately, patients say they want effective treatment delivered by trusted professionals.[2]

In order to support these themes and drive effective patient flow the multi-disciplinary team (MDT) needs to be organised and designed to ensure consistent, high-quality and timely service provision. The identification of pharmaceutical care issues and resolution of medicine-related problems must occur early in the patient journey to avoid omissions or delays in medication provision and ensure appropriate decisions about medication.

Seamless communication at the interfaces of care needs to continue to be considered a priority. Rather than a new episode of care, admission to hospital needs to be considered a transition or escalation in care provision for a large majority of patients with chronic diseases. Electronic transfer of up-to-date information about the patient should continue to be a focus of investment.

In the meantime, while the information technology is under development, AMUs should have robust procedures for medicine reconciliation early in the patient stay. Rates of unintentional medication discrepancies are unsurprisingly highest at the point of admission,[3] with the literature reporting discrepancy rates of 30–70%.[4] On average, around 60% of patients will have one unintentional discrepancy and, of these discrepancies, approximately 38% have the potential to cause clinical deterioration in the patient.[5]

Decisions based on incomplete or inaccurate medication-related information may be inappropriate and have the potential to delay effective treatment and ultimately have a negative impact on patient flow through the organisation. Numerous studies have highlighted that medication histories undertaken by pharmacists contain less inaccuracies than those taken by nurses or junior doctors.[4] Furthermore, pharmacist-led medicines reconciliation has been estimated to be the most cost-effective use of NHS resources to prevent medication errors at hospital admission.[6]

Exposure of the patient to medication-related risk should be minimised. Pharmacy services should be weighted to supporting prescribing decisions at the point of prescribing rather than retrospective intervention. A multi-centre study of hospitals in the US estimated that adverse drug reactions were reduced by 48% when clinical pharmacist staffing was increased from approximately one to five pharmacists per 100 beds.[7]

Further research from the US suggests that pharmacist participation on medical rounds (as well as pharmacist-provided admission drug histories) is associated with significantly reduced mortality.[8] A study from 2001 suggested that as clinical pharmacist staffing went from one pharmacist per 300 beds to one pharmacist per 30 beds, US hospital deaths declined by 43%, from 113 to 64 per 1,000 admissions. This was considered cost-effective at an estimated salary cost of $320 per death avoided.[9] Pharmacist-managed aminoglycoside or vancomycin drug therapy in US hospitals reduced preventable adverse effects by 46%, length of stay by 12% and overall mortality by 6%.[10]

Moreover, the addition of a pharmacist to the admission 'post take' ward round has been shown to reduce the number of preventable adverse drug events (ADEs) by improving medicines management.[11,12] Consideration should be given to resourcing pharmacist participation in general medical ward rounds as a number of published

studies have demonstrated reductions in length of stay of at least one day linked to this activity.[13–5]

The admission process should not paralyse those that are able to self-care. The environment in which acute medical patients are managed should, where appropriate, be conducive to self-medication and using the knowledge and skills of the expert patient. The ability to identify those patients that would benefit by self-managing their medicines has the potential to reduce the risk of medication incidents, improve patient experience and reduce workload for nursing staff. Patients should be encouraged to bring medicines into hospital and, once assessed for appropriateness, these medicines should be used to reduce medicines reconciliation errors[16] and avoid unnecessary delays in the provision of medication. Self-administration schemes improve patient empowerment[17] and have been proven to improve medication-related knowledge and concordance.[18,19] Reliable and robust mechanisms for assessing the patient's ability to self-medicate should be standardised throughout AMUs and should be integrated within the pharmacy service provision.

Non-adherence to new medicines prescribed for chronic conditions develops quickly, with up to 30% of patients becoming non-adherent ten days after starting therapy.[20] Good adherence to prescribed medicines is associated with positive health outcomes, including lower mortality and reduced hospital re-admission.[21–3] Focused education has been proven to improve adherence rates[24] and can be supported with appropriate pharmacy services, also addressing patient-experience issues raised from Picker Institute surveys indicating that patients would like more information about their medicines.

Due to potentially overwhelming amounts of information provided on admission, the vast majority of medication-related counselling will undoubtedly occur on downstream ward areas. However, there is an opportunity to improve the patient experience by communicating frequently and in lay language about changes to medicines (stopping or changing previous medicines and starting new ones). This can be coupled with the ability to reduce risk by counselling those patients directly discharged from the AMU. Discharge counselling should be adequately resourced as it can reduce pressures on capacity by reducing medicines-related re-admissions. In some cases, pharmacy technicians may be suitable to undertake discharge counselling, allowing pharmacists to prioritise more complex cases.

TIMELY, EFFICIENT AND EQUITABLE CARE

Over a three-year period there were 21,383 patient safety incidents related to delayed or omitted doses of medication reported to the National Patient Safety Agency. Contained within these reports were 27 deaths and 68 severe harms.[25] The two predominant reasons for the non-administration of medicines include lack of medicine availability within the clinical area and patients with compromised swallow, thereby deemed nil by mouth.[26] Systems for efficient ordering and storage of medicines are critical for reducing missed doses and medication errors and for releasing nursing time. In addition, pharmacy services must be proactive to ensure this type of harm is avoided and need to work collaboratively with other healthcare professionals to identify and resolve such issues promptly.

In the interest of equity the MDT needs to provide seven-day support. Patients should not experience differing levels of service simply due to the day they are admitted. It has been long established that patients admitted at the weekend with serious medical conditions have a higher mortality.[27] The majority of support services tend to operate reduced levels of service at weekends; often these fall well short of the needs of the newly admitted patient. Compressing seven days' worth of work into five days ultimately places significant demands at the start and the end of the week, which subsequently creates bottlenecks in patient flow.

Effective handover of information from admission to general medicine wards was a strong feature of the Acute Care Tool-kit.[28] Communication of planned changes to medicines throughout the patient journey is crucial to improving inpatient care and supporting discharge reconciliation. Patients that are well educated and supported in regard to their medication changes at discharge are less likely to experience preventable adverse effects or be re-admitted.[29]

THE PERFECT SYSTEM IN THE BEST ENVIRONMENT

After the decision to admit, the patient would then be seen by the clerking doctor, nurse and members of the MDT in close succession. In a pharmacy context, the first review should include an assessment of the patient's own medicines, clarification (using a range of sources) and documentation of their medication regimen. These initial processes should ideally be undertaken by appropriately trained pharmacy technicians, releasing the pharmacist to concentrate on discrepancies, dose adjustments that may be necessary and to review for potential ADEs that may have contributed to admission. It may also be appropriate at this point to assess the patient's ability to self-medicate and engage the wider MDT to identify other problems and propose solutions.

The AMU MDT should continue to convene at appropriate intervals to review available information and evaluate the ongoing plan for patient management. Decisions should be made by consensus with input from the relevant healthcare professionals and actions assigned to the most appropriate staff for feedback at

J Allen

the next MDT meeting (e.g. confirmation of allergy status, confirmation of drug history, alternative treatment options for patients with contra-indications). To improve continuity of care, reliable handover channels for each healthcare professional group within the MDT should be established.

Multi-disciplinary, individualised discharge planning should occur as this has been shown to reduce re-admission rates and length of stay.[30] Pharmacists in the AMU must have an efficient and timely system for handing over information regarding pharmaceutical care to colleagues on downstream wards and this information must be readily available for review during the discharge planning process. It is important that pharmacy services are adequately resourced to support continual review of patients, especially those identified as having ADEs on admission as this has been shown to reduce length of stay and mortality.[8]

In those patients identified as suitable for discharge the ability to use ward-based dispensing systems has the potential to provide more timely medication provision. All patients discharged should be counselled by an appropriate member of the pharmacy team with local systems in place to identify those that may be technician-led. All changes to medication and any primary care follow-up required should be communicated clearly and in a timely fashion to those that would need the information.

There should be the ability for patients with questions about their medicines immediately post discharge to contact the pharmacy team. For those patients at the most risk, telephone follow-up should be considered as it has been shown to reduce the risk of ADEs and re-admission.[29] In addition, formalised channels of referral to a community pharmacy should be developed to support discharge reconciliation with the aim to reduce confusion related to excess medication that may have been left at home.

It is obvious that hospital bed capacity and the perpetual demand for non-elective beds have a significant impact on patient flow through the AMU. However, increasing the size of the AMU in isolation is unlikely to provide a solution for delayed patient transfer and poor patient flow.[31] Lack of capacity within downstream specialist ward areas is likely to result in an increased length of stay on the AMU. This is likely to have a negative impact on specialist patient care because resources are then split between acute and general care. Even when entire hospital capacity and demand are well matched, bottlenecks can occur if staffing resources are not adequately matched for changes in demand. Developing the ability to manage or predict demand and reallocate resource rapidly is one potential solution that can have positive results on patient outcomes and flow.[31]

It should also be noted that internal systems may generate inappropriate demands, especially where these are due to inconsistent service provision. The impact of rapid large-scale movement of patients from the AMU as a result of acute availability of downstream capacity can have a significant impact on the AMU. The resultant pressure on acute medical staff may overload service provision at particular periods in the day and ultimately has the potential to create risk and adversely affect patient experience. Timely predictable provision of discharges, designed to provide a steady supply of available beds, is one necessity to avoid these situations. This will almost certainly involve the need for ward-based pharmacy services to be well resourced as significant planning for complex discharges will be necessary to obtain the required level of predictability.

Future efforts to improve flow throughout the entire hospital should also encompass systems to reduce re-admission and streamlining referral to primary care services, including social support. Consideration should be given to the effective use of ambulatory care and hospital at home services. These have the potential to release capacity in a predictable fashion and improve patient experience. Within this it is necessary to ensure ambulatory capacity is protected, especially in times of high bed occupancy.

When implementing these strategies, it is important not to disregard the need for continual medication review and careful patient group selection for home care. Pharmacy services should be resourced to include a review of these patients as high re-attendance rates can be observed in home-care patients where attention to ADEs are neglected.[32,33] Pharmacist prescriber-led ambulatory pathways should be developed. The management of anticoagulants or once-daily aminoglycoside antibiotics are potential examples in which pharmacists could support ambulatory management and the release in capacity observed using ambulatory care models.

CONCLUSION

In summary, the provision of high-quality, consistent medicines optimisation via seven-day pharmacy support services has the potential to significantly improve patient flow and enhance patient experience. Pharmacists are integral to promoting medicines optimisation and subsequently improving patient outcomes. Evidence suggests pharmacists can achieve this by reducing medication-related adverse effects and improving medication-related education and adherence. Timely discharge support, coupled with reduced re-admission rates, has the potential to reduce demand and provide more predictable capacity. Ultimately these factors provide a positive impact on patient flow through the AMU.

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Balancing elective with emergency flow

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INTRODUCTION

The efficient management of variability in demand patterns has been heavily studied across a wide range of industries and service providers, including healthcare delivery systems.[1] The Institute for Healthcare Optimization (IHO) faculty first introduced the distinction between the natural variability of unscheduled emergency patient demand and the artificial variability in scheduled or elective admissions (which is directly controlled by the hospital's admitting practices) within the context of a hospital system.[2] In addition to introducing these terms, IHO has further examined these competing patient flow sources, making a counter-intuitive discovery that artificial variability in elective patient flow to be a major driver of variability, a finding that has since been confirmed by many studies.[2–4]

Emergency and elective patient flows compete within a hospital system for the same constrained resources of in-patient beds and operating theatres (OT). Poorly managed variability in patient flow is manifested in prolonged emergency department (ED) wait times, ED overcrowding, care delays, procedure cancellations, poor clinical outcomes, hospital-acquired infections, re-admissions, increased patient mortality and decreased staff and patient satisfaction.[3,5–10] As average life expectancy and the demand for elective surgeries continue to increase, hospitals must optimally balance elective and emergency patient flow into and within the hospital using evidence-based, data-driven operations management in order to provide efficient high-quality care.

MANAGING PATIENT FLOW INTO THE HOSPITAL

Scotland has achieved waiting time targets set for many inpatient surgeries as stated in the 2004 report *Fair to All, Personal to Each*, although out-patient elective surgery wait lists increased over three years prior to the report.[11] More recently, national health systems have documented increasing numbers of cancelled elective cases[12] and many countries have struggled with providing efficient emergency access to medical services.[13–16] These service issues are symptoms of stressed health systems struggling to manage constrained resources servicing competing patient flow streams.

Emergency patient flow vs elective patient flow

Variability in demand for services causes bottlenecks in patient flow and limits the ability of a hospital to provide care in an efficient and effective manner. This is often acutely felt within the ED and OT as emergency patients compete with electively scheduled patients for the same resource of in-patient beds and/or surgical services. For example, peaks in elective demand limits access to intensive care unit (ICU) beds, causing delays in critical care.[3] In the OT, competing demands from elective and emergency patients can result in cancellations of elective surgeries.[10]

Using IHO variability methodology®[1,17] natural and artificial variability (as introduced above) should be identified, measured, analysed and separated in order to design hospital systems that provide efficient and adequate resources for both streams of patient flow while eliminating artificial variability in scheduled admissions.[1] Natural variability can be managed by separating emergency patient flow from elective patient flow and modelling demand patterns for emergency care by month, day of week or time of day. While emergency demand is variable, it is quite predictable.[2,4,18,19] Queuing theory and modelling patient demand have been widely used in healthcare management to improve emergency patient flow to increase access to services, reduce wait times, improve quality of care and reduce healthcare costs.[1,19,30]

These methods, along with variability methodology, are recommended by the Institute of Medicine of the National Academies and others to control costs while increasing quality of care delivered by healthcare systems.[20–22] For example, variability methodology and modelled patient demand has been successfully used by several hospitals to separate emergency and elective patient flow in the OT and to determine the appropriate level of resources required to meet established wait times, resulting in reduced costs and increased patient throughput.[1,23,30]

BALANCING EMERGENCY AND ELECTIVE PATIENT FLOW IN THE OPERATING THEATRE

Confirming IHO early findings, separating the naturally variable emergency demand from scheduled surgeries by providing separate OT resources increases emergency patients' ability to access OTs, decreases elective case

cancellations and overtime costs, as well as increases use of elective OTs when disruptions from emergency cases are eliminated.[10,23]

Ensuring timely access to emergency surgery

Ensuring timely access to emergency surgery is a primary goal of any hospital providing emergency surgical services. Scottish Intercollegiate Guidelines Network (SIGN) guideline 111 specifically states that hospitals should organise services and resources to 'maximise the proportion of medically fit patients receiving surgery as soon as possible, within safe operating hours (including weekends)'[24] Guidelines for OT access requirements for emergency procedures have also been established in Scotland through various SIGN and NHS publications.[11,25] In addition, several studies have demonstrated significant difference in length of stay or clinical outcomes within specific subsets of patients requiring emergency surgery resulted from decreased wait times for access to the OT.[10,26]

A multi-year retrospective study showed that length of stay, complication rates and appendix rupture rates were significantly decreased in patients with appendicitis who had a shorter wait time between surgical consultation and emergency surgery. Patients who were treated by an acute care surgeon model experienced significantly decreased time from surgical consultation to surgery compared with a traditional home-call surgeon model (3.5 hours vs 7.6 hours) resulting in an average length of stay saving of 1.2 bed-days with a corresponding 47% decrease in rupture rate and a 56% decrease in complication rate.[26]

A single-centre study in Canada assessed the benefits of a dedicated emergency OT at a large children's hospital and found that the number of elective cases cancelled decreased significantly with the addition of an emergency OT. The addition of an emergency OT resulted in a significant increase in the number of priority three patients (requiring surgery in <12 hours) who met provincial wait-time criteria. Although not statistically significant (p=0.12), the average length of stay for 975 emergency patients was 16.0 days prior to the addition of an emergency OT. Post-implementation the average length of stay was reduced to 14.2 days, representing a substantial bed-days saving for the hospital.[10]

Classifying and measuring the variability in urgency and arrival rates of surgical patients allow hospitals to use mathematical models to optimise resources allocated to the separate urgent and elective patient flows. One hospital working with IHO instituted a multi-level classification system for urgent/emergency surgical cases, using mathematical modelling to determine resources required for each patient flow source. When applying variability methodology to allocate resources separated

by emergency and elective patient needs this hospital reported an increase in surgical volume and surgical minutes (the number of minutes that surgery is performed for a given time period) by 4–5%, an increase in net income and margin by 38% and 28%, a decrease in overtime staffing of 27% and in nurse turnover by more than 40%.[23]

As the above studies indicate, the separation of emergency and elective flow in the OT results in an increase in the number of emergency patients who receive timely care and a decreased length of stay for these patients, which can decrease pressure on the bed capacity of a hospital system while simultaneously increasing elective throughput, shortening wait lists for elective procedures and decreasing overall costs.

Smoothing elective admissions

Confirming the IHO's original counter-intuitive finding in 2000 that artificial variability in scheduled hospital admissions is more variable and less predictable than medical admissions through the ED,[2] several studies have demonstrated that variability in scheduled hospital admissions from the OT has been shown to be higher than the variability in emergency admissions.[3,4,27] Peaks in scheduled admissions have also been correlated with the inability to admit patients to the ICU, resulting in an increased number of patients placed 'off-service' onto a lower level of care or into another institution as a result of all primary intensive care beds being occupied.[3]

Based on IHO's successful projects on controlling artificial variability,[28,29] a 2006 report by the Institute of Medicine entitled *Hospital-based Emergency Care: At the Breaking Point* recommended smoothing patient flow by controlling artificial variability as the major intervention that would allow hospitals to decrease ED waiting times while increasing patient throughput and improving patient safety and quality of care and simultaneously decreasing costs.[30] One example of a hospital that fully implemented this methodology resulted in $100 million in avoided capital cost and more than $100 million increase in its annual revenue.[28]

Smoothing the elective admission schedule by admitting the same number of patients each day (over five, six or seven days) requires the hospital to ensure that appropriate resources are provided over the weekend to care for elective surgical patients admitted later in the week or over the weekend. Elective surgical procedures scheduled later in the week have been found to have a higher risk of mortality than those procedures scheduled earlier in the week,[31] suggesting that weekend resources in the hospital need to be increased to provide the same quality of care for those patients admitted on Monday as for those admitted on Thursday or Friday. Ensuring appropriate weekend resources for electively admitted

C Ward

surgical patients (e.g. case management, radiology, rehabilitation specialists, rounding residents and medical doctors) may also increase the quality of care provided to all patients residing in the hospital over the weekend as more services become available.

BALANCING EMERGENCY AND ELECTIVE FLOW IN IN-PATIENT UNITS

Right-sizing inpatient units to eliminate bottlenecks

When elective admission patterns are smoothed throughout the week, based on the anticipated unit or level of care where the patient will be admitted to, hospital management should be able to more accurately determine the ideal size of in-patient units.[32] Once this artificial variability has been eliminated, the remaining natural variability in patient flow can be modelled to optimise the distribution of bed types (ICU, telemetry, acute care), eliminating patient bottlenecks due to inappropriate bed allocations.

Smoothing in-patient elective admissions should decrease ED wait times as peaks in the elective schedule are associated with inpatient unit bottlenecks[3,9] and improve the quality of care since increased ED wait times and patient boarding in the ED have been shown to be associated with increased hospital mortality and length of stay.[33] Smoothing the elective schedule and right-sizing in-patient units should also improve a hospital's ability to place patients in the right level of care and may decrease the use of rapid response teams.[34]

Balancing patient flow sources to increase quality of care provided on in-patient units

When artificial variability in scheduled admissions is eliminated and a hospital's ability to meet and project inpatient bed need improved, it results in an greater ease in providing appropriate nurse–patient staffing ratios for these patients.[6] Smoothing the elective admission schedule will decrease the overall variability in a given unit's census, resulting in more consistent nurse staffing ratios.[6]

Patient–nurse staffing ratios are a significant factor in the quality of care provided and in patient outcomes since high patient–nurse ratios result in increased rates of hospital-acquired infections, re-admissions and mortality.[7,8,35,36] A cross-sectional multi-centre analysis determined that each additional patient per nurse was associated with a 7% increase in the likelihood of dying within 30 days of admission,[35] while a systematic review of studies examining patient outcomes and nurse–patient ratios found that the odds of hospital-related mortality was 9–16% lower for each additional nurse per patient day.[36]

By eliminating the larger source of variability in patient flow (artificial variability in elective patient admissions), the ability of hospital management to provide appropriate nurse–patient staffing ratios significantly improves, which should result in decreased mortality, re-admissions and hospital-acquired infection rates.[5–8]

Balancing emergency and elective flow to increase in-patient capacity

Optimal balancing of hospital resources for elective and emergency patient flows creates increased capacity within a system through reduced wait times and complications rates, resulting in increased patient throughput. Hospitals that implemented this methodology have achieved multi-million-dollar annual return on investment, coupled with dramatic improvements in quality of care, including decreased wait times.[23,28,29]

Health systems aiming to improve patient experiences and outcomes while increasing access for both acute medical patients and elective surgical patients require careful evidenced-based, data-driven operations management to optimally manage patient flow. Failure to do so will result in artificially reduced quality of care and inflated healthcare cost, none of which we can afford.

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Boarding: impacts on patients and systems

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INTRODUCTION

The National Quality Strategy ambition in Scotland states that 'the most appropriate treatments, interventions, support and services will be provided at the right time to everyone who will benefit, with no wasteful or harmful variation'.[1] The concept of boarding – defined as the treatment of patients in hospital areas constructed and staffed for patients with differing care needs to their own – is therefore taken as an indicator of suboptimal care.

'Boarding' is taken to encompass an array of descriptors, including: 'boarders', 'overflows', 'outliers', 'repatriations', 'bed-blockers', 'sleep-outs', 'decants', 'diversions', 'delayed discharges', 'sleepers' and 'off-template'. It can be further classified into two main types, dependent upon where the responsibility of care lies:

- Type 1 boarding: Responsibility of care lies with the parent ward (e.g. 'internal diversion', 'outliers', and 'off-template').
- Type 2 boarding: responsibility of care lies with the host ward (e.g. 'external diversion', 'access block' and 'delayed discharge').

Configurations of smaller units are more sensitive to surges in demand than pooled capacity, resulting in higher turnaway rates, all other things being equal.[2,3] Other reported risk factors for boarding include generic social and respite care needs[4,5] and conditions with a low acuity such as non-acute substance misuse[6] and cellulitis.[7] As treatment options become increasingly specialised, the likelihood that patients will be located within areas designed for care needs differing from their own also rises.

The practice of boarding is not uncommon and continues in the context of changing demand and annual reductions in acute bed numbers.[8,9] More than 50% of acute medical patients were reported to have experienced this practice in some Scottish sites during winter, occupying more than 10% of all inpatient beds.[10] It is also prevalent in England, with some trusts reporting 30% of acute surgical beds populated by medical patients in 2003.[11]

EFFECTS OF BOARDING

It is therefore essential that we understand the repercussions of boarding, firstly for the patient but also for the parent and host wards. Boarding has been shown to affect patient satisfaction with a survey reporting an adverse effect on perceived quality of care, comfort and discharge management.[12] With advances in modern medicine has come solid evidence to support the need for increasingly specialised treatment in optimising care for some conditions.[13–5] It has been shown that improved outcomes result from care in dedicated units by specialty clinicians[16] for an array of patient groups, including stroke,[17] cardiac,[18] acute assessment,[19–21] upper gastrointestinal haemorrhage,[22] acute hip fracture[23] and elderly patients with rehabilitation needs.[24,25]

Evidence of the effects of type 2 boarding is available from recent studies on boarding in the emergency department (ED). This is defined as non-clinical waits for admission or discharge and has been shown to be associated with increased adverse events,[26,27] and mortality[28] with notably worse outcomes in the older patient.[29] Moreover, crowding in the ED is associated with increased rates of patients leaving without assessment, delays at each stage of treatment and increased emergency re-admission and mortality rates.[30–2]

In comparison, evidence of negative effects of type 1 boarding is limited. There has been some work that indicates medication failures are more prevalent in boarded surgical patients,[33] and a survey of nurses suggested that more than 50% of non-trauma nurses would manage spinal injuries incorrectly and fail to monitor for compartment syndrome and other post-operative complications satisfactorily.[34] Evidence for prolonged length of stay has been shown in specific patient groups being cared outside the desired area, including chest pain and heart failure patients on surgical/non-cardiology wards respectively.[35,36] Similarly, admission to an overflow post-anaesthetic unit was associated with increased mortality for post-operative intensive care unit and ward patients.[37]

Boarding also reduces clinician activity within the parent ward secondary to 'safari ward rounds' involving the review of patients in multiple separate wards usually following ward rounds in their base ward.[38–42] Difficulties locating each patient under that clinician's care leads to increased time taken to review each patient[43] and impacts on continuity of care.[44] Host areas are also subject to cancellation of elective surgery[45–7] and increased infection[48] through the presence of boarded patients.

SCOTTISH COHORT STUDY

Although the above work is informative, the full extent and impact of boarding across different patient groups needs further exploration. We performed a retrospective cohort study of more than three million inpatient episodes completed in 20 NHS Scotland hospitals between 2008 and 2013.

A study cohort was defined using an adapted form of cluster analysis to identify type 1 boarded patients from retrospective patient administrative dataset extracts. This group was then compared with boarding estimates reported weekly by each hospital. We analysed which patients were being boarded in what way and whether those factors were significantly associated with hospital length of stay and risk of death or emergency re-admission to hospital within seven and 30 days for boarded and for non-boarded patients. We more generally compared type 1 boarding rates with published statistics relating to patient safety, including healthcare-associated infection, and cancellation of inpatient elective procedures. Stochastic queuing models were constructed to assess the extent to which these predicted the variation in both derived and self-reported boarding rates.

The initial results of this work will be shared at the Acute Medicine UK Consensus conference in November 2013.

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This paper is an explanatory paper for consideration of stakeholder opinion and relevant data that are in the public domain

What is the ideal bed occupancy and how do we achieve it?

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INTRODUCTION

In the NHS we tend to describe hospital bed usage using average percentage bed occupancy. This is an unsatisfactory measure for a number of reasons. For one thing, not everyone agrees on how the measure should be calculated, so we can often find ourselves embroiled in endless arguments about whether we've worked it out correctly. For another thing, the numbers themselves conceal more than they reveal about bed usage. Thirdly, we tend to use percentage bed occupancy numbers just to describe what current bed usage is instead of determining what future bed usage ought to be. It's only when we arrive at a place where we know what the right bed occupancy should be that we'll know which levers to pull, and which adjustments we need to make, in order to get bed occupancy right and keep it right. To get to that place we have to make a journey that involves several steps:

Step 1: Understanding average percentage bed occupancy

If the first problem is that bed occupancy is a 'contested concept', we need first of all to understand exactly how the average percentage bed occupancy calculation works. We need to understand how to measure the numerator (occupied bed days) and the denominator (available bed days). And we need to be wise to the different approaches that can be taken. Are we using midnight snapshots of bed occupancy or are we looking at bed occupancy at other times of the day? Are we looking at bed occupancy for an individual ward or are we looking at it for a specialty as a whole?

We also need to understand what complications there are that get in the way of calculating bed occupancy, e.g. getting the bed complement numbers right, working out how to deal with boarders/outliers. But if we can surmount these data quality and definitional issues, we can reach a working measure of average percentage bed occupancy. The trouble is that, as a way of describing it, there are still shortcomings with average percentage bed occupancy. One of these shortcomings is that we miss important detail using this single-number method. That's what we'll address in Step 2.

Step 2: Time series lines and histograms

If we want to get the detail, we need to find a better way to describe occupancy. This better way will need to be a visual method if at all possible. A visual method of describing bed occupancy is most likely to be understood by the range of disciplines that need to be looking at bed occupancy. We need to be looking at how bed occupancy varies from day to day and from hour to hour. We need to see if occupancy is different at weekends from weekdays. We need to look at bed occupancy as time series lines. Interactive time series lines would be even better. Once we start to describe bed occupancy using time series lines we'll also start to solve some of our data quality problems. We can introduce the idea of histograms here, too, because most clinicians instinctively understand histograms in relation to bed use. This now gets us to a better place, where we can describe bed occupancy in an accessible way that has both meaning and resonance. But we are still just describing the world, when what we really need to know is whether the occupancy we are describing is the 'right' occupancy or not. Does the time series line need to be lower down, higher up, smoother or rougher? For this, we need Step 3.

Step 3: Measuring dysfunction

If we want to know what the right occupancy is, we have to understand the cause-and-effect relationships in the system. We have to know what the bed occupancy is when good things happen; and we have to know what the bed occupancy is when bad things happen. This means we have to know how to measure dysfunction. In most health systems dysfunction caused by 'wrong' bed occupancy levels are things such as over-long delays in A&E for patients who need to be admitted, too many outliers (patients accommodated in beds of the wrong clinical specialty) and cancelled operations.

By examining the relationships between bed occupancy and dysfunction we can make headway. We can start to identify the right levels of bed occupancy for the different parts of the system, given different levels of demand and activity. Several real-life examples of how we'd go about doing this will be provided in the presentation.

CONCLUSION

There are three main problems with the way we currently measure and describe how we use beds in the NHS. Firstly, we use a number whose calculation is argued about; secondly, we use a number that conceals more than it reveals; and, thirdly, we frequently fail to move beyond mere description and onto the determination of what bed occupancy ought to be. All three of these obstacles can be surmounted.

This paper is an explanatory paper for consideration of stakeholder opinion and relevant data that are in the public domain

Can design improve the quality of patient care through more efficient patient flow?

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'Artists solve their own problems; designers solve other people's.'
–Alan Fletcher, Founder, Pentagram Design

INTRODUCTION

How do we define 'quality of care'? The Care Quality Commission manifesto of 2008 went to some length to do so.[1] The clinical view might tend to focus on the quality, effectiveness and skill demonstrated in delivering medical care and in eliminating or minimising error. Yet most of the language employed in the manifesto concerns dignity, the patient experience, respect for diversity and an impressive array of 'softer' human and behavioural subtleties. While nearly everybody in our team at The Helen Hamlyn Centre for Design has trained to Masters' level in the Royal College of Art's design departments, we are a group of designers with a range of skills that you might not expect to find in an art college. Most of the industrial designers in our healthcare and patient safety lab trained first as engineers, and we also have designers experienced in medical device development, product engineering, biomechanics, architecture, ethnography, graphic design and behavioural psychology.

Too much design solves problems that aren't really priorities. A lot of 'Design', as per aspirational, fashionable 'Designer' products, amounts to little beyond elitist narcissism on the part of arrogant designer and client. Do we really need yet another voguish chair, coffee table or idiotic lemon squeezer, for example? Do we want to Design for Vanity, Design for Landfill – or Design for the Real World?

We do need to find answers to the challenges of keeping an ageing population active, interacting socially and economically, and making our health service safer and our workplaces more sustainable. These are the problems that we believe are more worthy of designers' attention.

What can design contribute to improving quality of care through effective patient flow? My presentation will focus on case studies of three projects that we have carried out at the Helen Hamlyn Centre for Design. All three have led to design interventions, be they physical products, environments or process improvements. Each has required a systems-based approach driven by user-research, extensive study of a complete journey through a system, the definition of a detailed process map and an analysis of the real, everyday challenges that are actually encountered in the environment. Essentially, this is just a people-centred approach to operations research. It informs a design and development process, carried out with (rather than for) the healthcare staff and patients involved. In each case, involving the end-users at all stages ensures that their extensive knowledge is incorporated; they see that their ideas are valued and their buy-in and commitment to the solution are assured.

Furthermore, each project has benefited from having an advisory board of influential people representing the key stakeholder groups, and these features of project structure have helped with eventual commercialisation and adoption of the solutions.

This 'Inclusive Design' approach provides a valuable methodology that can be employed equally as well to improve the efficiency of patient flow, as to reduce medical errors during a patient's stay in hospital, improve safety in ambulances and reduce unnecessary admissions to accident and emergency departments (A&E), and reduce violence and aggression in A&E departments.

Case study 1: DOME.

Designing Out Medical Error (DOME) was a three-year study (2008–11); the title summarises the aim of the work. We used the patient journey as a structure to expose our researchers to the whole process of elective surgery, observing and mapping it from admission to discharge. Developing this understanding allowed us to highlight the points at which errors can occur, which we then prioritised via failure modes and effects analysis, root cause analysis and hazard scoring, working with experts in each of the high-risk processes identified.

We made a parallel study of analogous industries (for example, mining, chemical, oil exploration, shipping and construction) to observe their different cultures and methods of risk mitigation, comparing and contrasting to see whether healthcare could learn from these other risk industries.

The Inclusive Design methodology relies on various techniques: immersive user research using a broad range of methods, distillation of evidence-based design briefs, co-design, prototyping and co-evaluation, iterating the process until the agreed solutions are satisfactorily tested and validated.

The five highest risk processes (hand washing, observations monitoring, isolation of infection, medication delivery and handover) were used to inform design briefs for physical products, environmental design and process interventions, creatively combined to address several hotspots simultaneously. Among these were:

The CareCentre

This contains gloves, aprons, hand gel, a medication locker and a bin and has a flat surface for reading and writing documents. It makes equipment much more readily accessible, streamlines the work and improves efficiency, compliance and infection control.

The Vital Signs Trolley

This provides an easy-clean design, improved cable management system to reduce the risk of infection, a touch-screen interface for easy collection of vital signs (including respiratory rate) and automatic plotting to remove transcription errors. The trolley can dock with a larger computer on wheels.

The Handover Room

This converts an existing staff room into a multi-purpose, effective environment. Because space is at a premium and it is not possible to have a room solely for handover, it equips the staff room with all the necessary equipment for a structured, rigorous handover, with suitable lighting, writing surfaces, signage to reduce interruptions and formal seating for up to ten nurses. When not being used for handover it provides relaxing lighting, comfortable seating and a kitchenette for staff to take their breaks.

Ambulance Design

Again, a whole-system analysis has been used, starting with a concentrated research programme into the ways in which ambulance services have operated, both historically and currently. The vehicles have developed incrementally from horse carts used in the Crimean War to transport injured soldiers from the battlefield to rudimentary field hospitals. Clinical science has progressed beyond recognition since then, particularly since the 1980s.

Advanced Paramedics (or Emergency Care Practitioners) are able to diagnose patient complaints, are licensed to carry and administer more powerful drugs, treat and discharge on-scene, or refer to other services as required. Therefore, other options now exist, alongside the traditional treatment pathway of transporting everybody to an A&E department, clogging it with non-essential drains of resource.

Further, Department of Health data show that roughly 60% of UK 999 calls do not require hospital treatment; 20% self-resolve or the patient (of sound mind) declines

to be taken to hospital.[2] The remaining 40% are minor, 'Urgent' conditions (rather than 'Emergencies') that could be treated in the community by a paramedic, given basic facilities. Even if only 5% of these 40% of calls were resolved at the ambulance and kept out of the A&E department, £38 million could be saved per year UK-wide, at the most conservative estimates.

Our 'Future Ambulance' (2006) and 'Smart Pods' (2009) projects identified ten problematic areas in ambulances that could be improved through better design. We then outlined a system proposition, comprising standardised equipment packs, treatment spaces, small solo responder vehicles, temporary kiosks and improved emergency ambulances. This system is able to treat minor complaints and injuries more cost-effectively and to greater patient satisfaction in the community, but it is also able to take emergency patients for the 'right treatment, in the right place, first time' in specialist stroke, cardiac and trauma centres.

The improved ambulance required for this work has been researched, co-designed, mocked-up and iteratively evaluated, through our Ambulance Redesign project, leading to a Demonstrator Unit that is currently progressing toward prototyping and eventual commercialisation.

Reducing Violence and Aggression in the A&E Department

Again, a whole-system analysis has been used, starting with a concentrated research programme into… Sounds familiar?

To redesign and rebuild poorly designed A&E departments was outside of the scope of the project. Instead, six months of desk research and ethnographic research were carried out to identify the perpetrators of violence and aggression in A&E departments, the triggers of that behaviour and the touch points where patients interact with the system. The patient journey was mapped through observations, interviews and workshops with front-line A&E staff and patients in three NHS hospital trusts.

'Trigger points' were: unsatisfactory environments, inadequate communication and enforced, indeterminate periods of waiting by diverse groups of people that are not comfortable together (e.g. intoxicated, elderly, children). Similarly, 'perpetrators', such as people intoxicated through drink or drugs, confused or mentally ill people, were identified.

Our multi-disciplinary team (designers, researchers, clinicians, psychologists and consultants) consulted experts in the fields of behavioural science, the built environment and clinical care, concluding that the

E Matthews

patient and staff experience can be improved through better communication throughout the A&E journey. Interventions include:

- **Guidance:** a modular information and communication system of leaflets and posters and a digital app designed to empower patients with key information about their visit.
- **People:** a reporting tool and reflective practice system that helps staff deal better with potentially aggressive patients, while making it clear that no aggressive behaviour whatsoever will be tolerated.
- **Web-based toolkit:** aimed at NHS commissioners and decision makers, to provide them with the overview necessary to implement these measures retrospectively and at a fraction of the cost of redesigning and rebuilding existing facilities.

CONCLUSION

Through these project case histories, it can be seen that the Inclusive Design approach can deliver solutions that make positive impact as products, processes, systems and changers of organisational behaviour and culture.

We believe that the methodology described could be productively directed to improve the efficiency of patient flow, as the challenges are similar.

When researcher-designers immerse themselves in an environment, in dialogue with the various stakeholders and user groups, processes can be understood and mapped. Subtle insights can be learned through dialogue with clinicians and patients, from which real needs and problems can be identified and understood, and design briefs created on the basis of evidence, rather than subjective opinion alone.

Co-design provides a fantastic framework within which front-line staff discover that they can be highly creative, and possess real skills in practical ergonomics and human factors design, when they work alongside design professionals who design with, rather than for them.

When simple simulations and mock-ups are built, they can be iteratively evaluated by prospective users of the eventual design. Robust, scientifically analysed evaluation data and the combined assessments of staff and patients provide commissioners and manufacturers with compelling evidence of the value of an innovation. This builds commercial confidence, and develops the stakeholder buy-in necessary to achieve adoption when an innovation comes into service.

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SETTING THE CONTEXT

Mr Jim Martin,
Scottish Public Services Ombudsman

The Scottish Public Services Ombudsman (SPSO) receives over 4,000 complaints a year, and approximately 30% of these are about the NHS in Scotland. Last year the SPSO saw a 23.5% increase in complaints about the NHS compared with the previous year – not necessarily a reflection on the quality of care, more likely a consequence of people seeing more publicity about complaints being taken seriously and leading to action, which has in turn made them feel more comfortable about complaining.

Are complaints taken seriously enough by physicians? The critical elements of failure in Mid Staffs were about culture, governance and management in a climate where financial and performance driven reporting and public image replaced service as the key significant performance indicator for the Trust. What matters to patients is the quality of their care and if we are genuine about person-centeredness then we must give the experiences, concerns and complaints expressed by patients and their families sufficient weight. Health professionals should respond to them as equal partners in their care and learn from the feedback they provide.

What are the barriers to good complaints handling by physicians? Time? Concerns about litigation? Lack of willingness to admit mistakes and learn from them? Little value attached to complaints?

The challenge of the Francis Inquiry is to ensure that we have the right management and governance processes in place. Key to this is improving the status and professionalism of those responsible for managing complaints and giving them a role in informing decision-making and decision-makers. We need to embed a culture in the NHS that does not see complaints as a threat, encourages a mindset of quick resolution and admits failings. This requires a clear signal from the most senior level, visibly supporting a culture that values complaints throughout the organisation.

Further information

Scottish Public Services Ombudsman:
www.spso.org.uk
SPSO Complaints Standards Authority:
www.valuingcomplaints.org.uk
The Mid Staffordshire NHS Foundation Trust Public Inquiry, chaired by Robert Francis QC:
www.midstaffspublicinquiry.com

A PATIENT'S AND CARER'S PERSPECTIVE

Gina Alexander,
Patient Opinion

Abstract not available.

A NURSE'S PERSPECTIVE

Mrs Gillian Corbett,
Associate Director of Nursing, NHS Lanarkshire

There are many key challenges that face acute hospital medical services. The number of patients over 65 years old presenting with co-morbidities is increasing, a looming workforce crisis and the poor continuity that patients receive when admitted to hospital demand us to look at different ways of working. Patients are moved around in a system designed to deal with volume rather than quality, where hospital and community staff work in isolation and the role of the nurse is underutilised. This leads to poor quality, disjointed care and frustration.

Patient flow through an acute hospital is a complex series of events that relies on hundreds of multidisciplinary interactions being carried out timously to a high standard. At the very heart of these interactions is the patient. This patient relies on the pivotal role of the nurse to act as their advocate, coordinator, counsellor and friend, as well as delivering 80% of their care. This presentation has been informed by a project which reviewed the pathways of patients over 65 years old, who presented at three district general hospitals in Lanarkshire. Carried out in February 2013, by a multidisciplinary and multiagency group, it tracked patients who were admitted from defined localities for a period of 28 days. The presentation will look at care journeys from a nurse's perspective, challenge the status quo and propose future models, where an integrated workforce is productive, responsive and supportive to patients needs.

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SESSION 3: MULTI-DISCIPLINARY TEAMS FOR BETTER PATIENT EXPERIENCE AND CLINICAL OUTCOMES

A RADIOLOGIST'S PERSPECTIVE

Dr Hamish McRitchie,
Consultant Radiologist, Borders General Hospital

Introduction

Radiology is critical to patient flow. It is key to initial diagnosis and assessment of the complexity of pathology. Radiology examinations also monitor progress and assess deterioration. At the point of discharge final radiology is often required to confirm treatment success.

Radiology resource consideration and bottlenecks

Computed tomography, magnetic resonance imaging and ultrasound are under significant pressure in most hospitals. Internal queues for access to these modalities constitute bottlenecks impeding patient flow. Key to making best use of radiological examinations is expert interpretation. Lack of capacity to produce radiology opinions on an adhoc basis is commonly a further bottleneck.

Acute medical admissions present seven days a week without excessive variation. They present throughout the 24 hours with a predictable late morning to mid evening peak. Timely radiological assessment and decision-making requires departments staffing profiles to meet this pattern of demand.

Planned vs unplanned

Key to timely radiology imaging and reporting is separation of planned and unplanned activity. Where this is not achieved planned radiology activity may delay access for unscheduled medical patients and slow decision-making and consequently patient flow.

Requirements for a timely service

Radiology departments should be responsive and able to provide key diagnostic tests with a short lead time during daylight hours seven days a week. For acute inpatients, reporting needs to be immediate with communication of the result to the decision-maker for the patient. Easy access for the clinical team to an expert radiologist must be available throughout the same time span, to discuss appropriateness of test requests, their urgency and to discuss results of tests already performed. Radiology departments should also consider providing test-requesting by non medical staff or via protocol driven routes so that common patient pathways can be accelerated providing appropriate information to aid decision-making.

SESSION 5: DELIVERY DESIGNS – HOW FORM FOLLOWS FUNCTION

AN OLD BUILDING THAT WORKS

Dr Nick Roper,
Consultant Physician, University Hospital of North Tees

My presentation will cover several factors that we have found to be critical to the management of patients through our unit. The first of those is having a clear operational policy, or put another way, an understanding of the purpose of the unit, how that fits into the overall emergency care flow and how the unit will be resourced and managed. This description must be unambiguous and shared with all stakeholders.

Once there is clarity about the function of the unit and the anticipated workload, then it is important to shape the physical environment in a way that facilitates the desired model of care. For example: the relationship between ambulatory care and the assessment unit can have a major impact on the case mix that can be managed as ambulatory; the site and size of a waiting area for ambulatory patients can significantly affect the unit's capacity. The size of the overall unit must be realistic to cope with the number of patients and the actual length of stay achieved. The design must provide for clear 'command and control' functions within the unit, to allow oversight and proactive flow management.

Within any unit the staffing mix is pivotal to delivering a high quality service. Put simply, supply must equal demand. The numbers of staff, both junior and senior medical and nursing as well as allied health professionals (AHP) and support, should be mapped against the patient flow, so that staff numbers match demand at all times. This will not follow a 9 to 5 pattern, so shift patterns and working practices will need to be adapted to accommodate this, typically with a movement of staff into evening and weekend working.

Finally there needs to be a clear escalation plan for what will happen on 'a bad day' and this plan needs to deliver a demonstrable increase in capacity.

THE CHALLENGES OF WORKING IN A NEW BUILDING

Dr Hannah Skene,
Consultant Acute & General Medicine, Chelsea and Westminster Healthcare NHS Foundation Trust

The opportunity to build a new hospital occurs once in a generation, at most. Making new hospitals fit for current and future purpose, as well as look the part, requires intelligent design if they are to deliver on their promise

of high quality and safe healthcare, better patient experience, and a happy and productive workforce.

Despite different terminology being used internationally, quality literature on defining good flow, and the effects of flow on patient outcomes and experience is increasingly available. However, very little has been published on how the physical design of a building or department affects flow.

This talk shares my experiences of working in new hospitals as well as relevant literature on the effects of new buildings on patient flow. Co-location of departments;[1,5] size, configuration, and occupancy of ward space;[2,3,6] integration of new technology;[2] potential effects on patient safety;[2] staffing establishment considerations,[1] and patient and staff experience[4,6] will all be discussed. This may all seem like common sense, but it can get overlooked at the planning stages.

If you could start from scratch, what would your ideal new hospital build look like, and what can you learn from the successes and mistakes made by others?

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SESSION 7: PATIENT FLOW: COMMUNITY TO HOSPITAL TO COMMUNITY

OLDER PEOPLE IN ACUTE CARE

Dr Christine McAlpine,
Consultant Stroke Physician, NHS Greater Glasgow

Focusing on improving patient flow for older people admitted acutely to hospital has significant potential for reducing hospital bed use; 10% of all emergency admissions stay for over two weeks: that group accounts for 55% of all inpatient bed days and 80% of the group are over 65 years old.[1]

Many people aged over 65 are fit and independent. Our challenge is improving care for the frail older person. Admission avoidance schemes attempt to reduce admissions of 'less sick' patients; those needing hospital admission are usually sicker and frailer, with significant and often multiple medical problems such as stroke, myocardial infarction, pneumonia, delirium, dementia, etc. Comprehensive geriatric assessment (CGA) reduces mortality, institutionalisation, readmission to hospital and overall cost, and improves functional independence and 'morale'.[2] There is strong evidence for prompt admission of frail older people to specialist geriatric medicine units – 'visiting teams' do not achieve the same effect.[3] Services now aim to bring multidisciplinary CGA to all patients who need it at the 'front door' and onwards.[4] A specific problem for older people is 'boarding' – which increases the risk of falls and delirium and may remove patients from the specialist environment which will provide the best outcomes.[5]

Across the UK there are many initiatives to improve the effectiveness of acute care of older people – a quality improvement programme in Sheffield redesigned the pathway for older patients from admission to discharge and produced a 15% reduction in mortality and a significant reduction in length of stay, saving sufficient bed days to close two wards.[6]

Key points for optimising the flow of frail older patients are providing specialist assessment early after hospital admission, ensuring appropriate placement in a specialist ward providing CGA, and using a multidisciplinary approach, working towards prompt discharge with minimisation of ward moves.

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'HOSPITAL AT HOME' OR 'HOSPITAL AT THE HOSPITAL' – THE LANARKSHIRE MODEL

Dr Graham Ellis,
Consultant Geriatrician, NHS Lanarkshire

Older adults with frailty are being admitted to hospital in increasing numbers. In NHS Lanarkshire admissions in patients aged over 75 have increased 45% in a decade.

Speaker abstracts

Reliance on a fixed bed base for acute care can no longer remain the only solution to a shifting demographic. Meta analysis has suggested that 'admission avoidance hospital at home' may offer significant advantages over inpatient care for selected patients, with a reduction in mortality. In combination with appropriate acute care, hospital at home schemes have plausible benefits for acutely unwell older adults. The avoidance of delirium, hospital-acquired immobility, hospital-associated infections, and hospital-related institutionalisation provide possible explanations for this potential benefit.

NHS Lanarkshire has operated a hospital at home scheme since February 2012 in the Monklands Hospital catchment area; 80% of the patients referred to the hospital at home scheme are able to be maintained at home after assessment and management by a team of nurse practitioners with therapists and a consultant geriatrician.

Local admission rates for over 75s have levelled off and in some sectors fallen. Hospital beds in the specialty have been freed up and the length of stay has fallen significantly. Patient and carer satisfaction with the scheme has been extremely high.

A GP'S CHALLENGES OF ADMITTING PATIENTS INTO ACUTE CARE

Dr Jean Hannah, Clinical Director, Nursing Homes Medical Practice, Glasgow

The aim of this session which follows the earlier evidence-based sessions, is to explore the pragmatic and practical aspects of admitting elderly patients.

The aim of this session is to explore the pragmatic and practical aspects of admitting elderly patients. Although focusing on experiences of the speaker's current role within the Nursing Homes Medical Practice (NHMP) which provides enhanced general medical services to approximately 2,650 patients in 58 nursing care homes in the Greater Glasgow area, reference will be also made to experiences within traditional practices too.

When asked about their perspective of admitting patients into acute care, the initial reaction of GP colleagues both within and outside the NHMP was that they did not experience any difficulties. Local arrangements mean that emergency admissions appear to be accepted readily compared to yesteryear. However further exploration revealed the challenges of when it is appropriate to admit, when other options might be better (if available), the impact of the admission on others and when planning ahead might have resulted in a different outcome. This then leads to the experiences of advance and/or anticipatory care planning and the Key Information Summary[1] and the benefits of these to the individual, those important to them and agencies involved in care and support including out of hours services and acute receiving units.

The suggestion is made that similar to the change in attitudes towards discussing a cancer diagnosis and its likely impact, there is a need for those working within the health and care sectors to be more ready and comfortable in talking about death to any group – including those who are older or frail, and to those important to them for whom the 'living bereavement' of dementia can be so devastating. Such approaches provide opportunities to address areas which are causing worry or fear with explanations, information and reassurance on an individual basis, then allow the focus to return to living and optimising current quality of life. In this way, the individual is more likely to have had the matters important to them addressed – which may be very different to those anticipated – and ultimately a peaceful and dignified death in the place of their choice.

Reference

1   *Key information summary*. National Information Systems Group, NHS National Services Scotland

POSTER BOARD	TITLE AND AUTHORS
PB01	**Improving patient safety by modifying handover processes** *N Stock, N Roper. University Hospital North Tees, Stockton TS19 8PE* Email: nadiastock@doctors.net
PB02	**A 24-hour live audit of local practices in the Acute Medical Unit at University Hospital South Manchester** *S Kershaw, P Keast, J Mandal. University Hospital South Manchester, Southmoor Road, Manchester M23 9LT* Email: suziekershaw@doctors.org.uk
PB03	**Irish national acute medicine programme patient flow model** *[1]O Reilly, [2]G Courtney. [1]HSE, Kilkenny, [2]National Lead Acute Medicine Programme, St Luke's Hospital Kilkenny, Ireland* Email: orlaith007@gmail.com
PB04	**The Race Unit: Rapid Access And Consultant Evaluation** *PJ Rushton, PZ Fade, M Thomas, RW Day. Poole Hospital NHS Trust* Email: matt.thomas@poole.nhs.uk
PB05	**Evaluating performance of a District General AMU** *GT Diamond. Hairmyres Hospital, East Kilbride G75 8RG* Email: gtdiamond@doctors.org.uk
PB06	**Identifying system level delays in patient flow through day of care survey** *E Reid, S Watkin, A King. Performance Support Team, Scottish Government, Edinburgh* Email: simon.watkin@borders.scot.nhs.uk
PB07	**Improving the older person's journey from the Medical Assessment Unit to the care of the elderly wards** *A Breckenridge, K Colquhoun, T Moylan. Gartnavel General Hospital, Glasgow* Email: kirsty.colquhoun@hotmail.co.uk
PB08	**Ambulatory assessment enhances patient flow** *L Leitch, H Elder. Acute Medical Unit, Ninewells Hospital, Dundee* Email: leahleitch@nhs.net
PB09	**Benefits of an electronic admissions board and bed management system** *[1]J Atkinson, [2]L Barton, [3]A Harrison, [4]N Roper. [1,2]Wansbeck General Hospital, [3,4]North Tees Hospital* Email: jane.atkinson@northumbria-healthcare.nhs.uk
PB10	**Mony a mickle maks a muckle – whole systems incremental change to improve flow** *V Devlin, G Mulholland, H Mackie, B McGurn. NHS Lanarkshire Board Headquarters, Bothwell G71 8BB* Email: veronica.devlin@lanarkshire.scot.nhs.uk
PB11	**Daily cardiology inreach to the Acute Medical Unit – case finding as a key to flow** *R Weir, H Mackie, G Mulholland, V Devlin. Hairmyres Hospital, East Kilbride G75 8RG* Email: veronica.devlin@lanarkshire.scot.nhs.uk
PB12	**Unpicking improvements in whole systems change: harnessing an unexpected benefit** *B McGurn, V Devlin, T Marshall, B Martin. Hairmyres Hospital, East Kilbride G75 8RG* Email: brian.mcgurn@lanarkshire.scot.nhs.uk

Poster abstracts

POSTER BOARD	TITLE AND AUTHORS
PB13	**Timely care for the elderly – are we doing enough? Waiting time to first medical assessment in a District General Hospital over 18 months** [1]S Nagy, [2]R Nunn, [3]H Chamali, [4]F Manneh, [5]A Keough, [6]L King. [1]Frimley Park Hospital, [2]KSS Deanery, [3,4,6]London/KSS Deanery, [5]Maidstone Hospital Email: szabi.nagy@me.com
PB14	**A vision of patient flow – now a reality?** K Milne, K Carter, S Close. Ward 101 Emergency Care Centre, Aberdeen Royal Infirmary Email: kimmilne@nhs.net
PB15	**How does ambulance demand and triage category affect our patient flow? Can we influence it to improve flow in our department?** K Milne, K Carter. Ward 101 Emergency Care Centre, Aberdeen Royal Infirmary Email: kimmilne@nhs.net
PB16	**A new building design – how has it affected our patient flow?** K Milne, S Close. Ward 101 Emergency Care Centre, Aberdeen Royal Infirmary Email: kimmilne@nhs.net
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PB18	**Changing consultant working patterns to support improved quality of care** H Mackie, G Mulholland, V Devlin. Hairmyres Hospital, East Kilbride G75 8RG Email: veronica.devlin@lanarkshire.scot.nhs.uk
PB19	**Are we ensuring safe and timely patient care in acute medical patients?** [1]S Chacko, [2]S Prabavalker. [1]MAU, The Ulster Hospital, Dundonald, Belfast BT16 1RH, [2]AMU, Royal Victoria Hospital, Belfast BT12 6BA Email: drshajic@hotmail.com
PB20	**Feasibility of a hospital at home service in West Lothian: evaluation of the first 100 patients admitted to a rapid elderly assessment and care team** [1]SG Ramsay, [2]M McMurray, [3]L Munang, [4]M Corretge, [5]L Kirby, [6]L Kelly, [7]N Fontaine, [8]L Yule, [9]C Swift. [1–4,9]NHS Lothian and [5–8]West Lothian Community Health Partnership, St John's Hospital, Livingston, West Lothian EH54 6PP Email: scott.ramsay@nhslothian.scot.nhs.uk
PB21	**Understanding bed management systems – an observational study** A Ratneswaren. Imperial College London, Charing Cross Hospital, London W6 8RF Email: anentar@gmail.com
PB22	**Safe domiciliary care of patients with spontaneous pneumothoraces with an ambulatory Heimlich valve bag to improve patient flow, patient satisfaction and reduce the length of hospital stay and healthcare costs: Ayrshire experience July 2012 to July 2013** A Guhan, S Learmonth, O Moseley. University Hospital Ayr, NHS Ayrshire and Arran Email: anurguhan@aol.com

PB01
IMPROVING PATIENT SAFETY BY MODIFYING HANDOVER PROCESSES

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Handover is a crucial element in patient flow but has also been described as one of the riskiest points in a patient's journey (see British Medical Association. *Safe handover: safe patients*. London: BMA; 2004). This study aimed to assess the handover system within an admissions unit and make subsequent changes to improve patient safety. Consultants, junior staff and nurses were surveyed to see how confidently they felt they knew which doctor was looking after which patient. They were also asked how well the electronic jobs list was kept up to date, and how often jobs were found at the evening handover that should have been done or acted upon earlier in the day.

Changes were then made in how junior doctors divide up responsibility on the ward, including the introduction of a daily whiteboard to display which doctor has taken on each role. An extra afternoon 'board round' was introduced, during which the electronic jobs list is updated. This is led by the specialty registrar or consultant, with senior nurse input. Evening handover processes were formalised and shift patterns changed so more members of the team could be present.

A repeat survey four months later showed substantially increased confidence in knowing which doctor was responsible for which patient. Respondents felt the jobs list was far more likely to be kept updated and fewer jobs were found at handover that should have been done earlier in the day. Overall, 85% felt that the changes had improved patient safety on the unit.

PB02
A 24-HOUR LIVE AUDIT OF LOCAL PRACTICES IN THE ACUTE MEDICAL UNIT AT UNIVERSITY HOSPITAL SOUTH MANCHESTER

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Aims: To examine whether our acute medical unit (AMU) was implementing the standard of care recommended by national guidelines and national benchmarking standards set out by the *Society of Acute Medicine's Benchmarking Audit* (SAMBA) 2012 (see Subbe CP, Ward D, Latip L et al. A day in the life of the AMU – the Society for Acute Medicine's Benchmarking Audit 2012 (SAMBA '12). *Acute Med* 2013; 12:69–73).

Methods: Live patient data were collected in the AMU at the University Hospital of South Manchester (UHSM) over 24 hours on 20 June 2013.

Results: The AMU at UHSM underperformed when compared with SAMBA 2012 and national guidelines in a number of key areas, including consultant review times, number of discharges and diagnostic investigation of pulmonary embolism. In the 24-hour period chosen, 69% of patients were reviewed by a consultant within 14 hours and, between 8 am and 6 pm, 53% were seen within six hours. Three patients were suspected of having a pulmonary embolism and none received a computed tomography pulmonary angiogram within 24 hours of admission. Significantly, 43% of patients were not assessed for venous thrombo-embolism (VTE).

Recommendations:

- Early consultant-led care through increased recruitment of acute physicians;
- Change to working patterns to increase senior support day and night;
- Admission prevention where clinically appropriate through improved communication between consultants and general practitioners (GP);
- Increased use of ambulatory care;
- Increased out-of-hours access to GPs;
- Public re-education;
- Electronic VTE risk assessment and nominated 'VTE visionaries';
- Improved availability of diagnostic scans and interpretation.

Conclusion: A new model of care for acute medicine proposed by UHSM (*A new model of care for medicine. Consultation feedback & the final model of care*. Manchester: UHSM; 2012) was implemented in 2013 addressing these recommendations. Annual re-audit is required to ensure standards are being improved.

PB03
IRISH NATIONAL ACUTE MEDICINE PROGRAMME PATIENT FLOW MODEL

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The National Acute Medicine Programme established a new model of care streaming acute patients from emergency departments (ED) into acute medicine assessment units (AMAU). Since 2010, it has been operational in all 33 hospitals and achieved a 33% reduction in trolley waits, improvement in patient experience, reduction of 1.5 days' length of stay, absorbing a 15% increase in admissions.

A national patient flow model was developed. Patients were referred directly from GPs to AMAU, medical patients presenting to ED had nurse triage. Triage category two and three patients were referred directly to the AMAU, shortening patient experience time. The planning number of expected admissions to hospitals was calculated at the 84th centile of demand, allowing expected avoided admissions, numbers of short-stay (<48 hours) patients, specialist ward patients and frail elderly patients to be calculated. Medical bed requirements were similarly calculated.

Hospitals ensured appropriately sized AMAUs, short-stay units, wards and staff were available. National benchmarks for performance, mirroring the flow of medical patients, were agreed. Feedback to hospitals on the flow through the units, bottlenecks and performance were given. Formal mapping of the flow process, sizing the capacity of units, and feedback on flow performance were effective in improving patient experience, safety of care and efficient use of resources. Emergency department trolley waits have improved, with less medical boarders in surgical elective beds.

PB04
THE RACE UNIT: RAPID ACCESS AND CONSULTANT EVALUATION

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Introduction: We assessed the impact of a dedicated, innovative rapid access and consultant evaluation (RACE) unit.

Methods: We analysed the effect on length of stay, discharge within 48 hours, re-admission rates and geriatric occupied bed days after the establishment of the RACE unit. The following practice changes were implemented:

- A 25-bed elderly medicine admissions ward, with early access to investigation and specialist review;
- Daily consultant triage ward round with senior nurse for likely discharges within 48–72 hours;
- Daytime referrals taken by a consultant, for informed discussion of alternatives to admission;
- Daily clinic on admissions ward;
- Daily multidisciplinary meeting after the ward round, involving medical and nursing staff, therapists, pharmacists and social services;
- Jointly funded integration between social services and intermediate care;
- Specialist nursing staff, with interest and expertise in geriatric nursing;
- Retention of packages of care for 48 hours after admission;

- Early follow-up of patients with telephone, intermediate care or consultant visit.

Results: Over three years following the establishment of the RACE unit:

- Length of stay fell from 13.5 to 8.1 days (40%).
- Discharges within 48 hours rose from 21% to 41%.
- Mean monthly occupied beds fell from 209 to 130 (38%).
- 30-day re-admission rate has risen from 12% to 14%.
- >30-day stayers fell from 606 to 318 (48%).

Conclusion: The RACE unit has led to sustained improvements in length of stay, discharge within 48 hours and number of occupied bed days, with minor increases in re-admissions.

PB05
EVALUATING PERFORMANCE OF A DISTRICT GENERAL AMU

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The Society of Acute Medicine's quality indicators for AMUs are intended to promote improved quality of care both within and between units. Patient flow is integral to this but varies widely between units. This project was undertaken to assess how a 28-bed district general AMU with an average take of 36 patients per day met the indicators and dealt with patient flow.

Over six months, random retrospective sampling was performed on 20 patient notes per month and assessed for time to first clinician and consultant review and location of review.

The median and maximum times to clinician review were 2 hours 25 minutes and 7 hours 53 minutes respectively. The indicator for review within 4 hours was met in 79% of cases. Time was not recorded in 25% of cases. The median and maximum times to consultant review were 12 hours 43 minutes and 20 hours 47 minutes respectively. The indicator for review within 14 hours was met in 57% of cases. Time was not recorded in 37% of cases. In all cases patients were seen by the first clinician outside AMU and the consultant in AMU.

Since patients were first reviewed outside the AMU this delayed their transfer to AMU and subsequent consultant review. Time was poorly recorded, making data collection difficult. There is a need for similar studies to build an evidence basis for best patient flow, but good record keeping must be highlighted to improve reliability.

PB06
IDENTIFYING SYSTEM LEVEL DELAYS IN PATIENT FLOW THROUGH DAY OF CARE SURVEY

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Aims: Identifying hospital stay 'appropriateness'.

Methods: Single-day analysis of hospital inpatients using a modernised appropriateness evaluation protocol. The survey has 28 illness severity and service intensity criteria used on all inpatients (excluding intensive care unit, obstetrics and paediatrics). Patients meeting any criterion are 'appropriate'. Patients meeting no criteria are 'inappropriate'. Survey teams assess why the patient remains in hospital and the preferred place of care. The performance support team developed the survey, provided advice and briefings, on-the-day assistance, data entry and results. The hospitals developed action plans based on the findings.

Results: The survey was easy to conduct, reproducible and readily understood. Preparation was important. There was minimal disruption to clinical activity. We surveyed more than 2,554 patients in six hospitals. The results provided data on age spread and length of stay (LOS), as well as 'appropriateness'. Patients with LOS>14 days had a higher chance of not meeting the criteria. There was also a consistent association between age and level of inappropriate stay. Overall, levels of inappropriate stay were 23% (range 18–28%).

Conclusion: Local teams can develop action plans based on their data. The survey can be repeated to detect system-wide changes. Level of inappropriate stay and the ability to identify this group suggests scope for improved patient flow by adjusting services to obtain sustainable reduction in the number of patients not likely to benefit from ongoing acute hospital care.

PB07
IMPROVING THE OLDER PERSON'S JOURNEY FROM THE MEDICAL ASSESSMENT UNIT TO THE CARE OF THE ELDERLY WARDS

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The National Institute for Health and Care Excellence advises to reduce ward transfers in patients with risk factors for developing delirium. Scotland's national dementia strategy also emphasises the importance of minimising bed moves. Our audit established the extent of this problem and considered interventions to improve practice.

Data collection was carried out across geriatric assessment wards (54 patients); looking at risk factors for developing delirium, number of ward moves before reaching care of the elderly (COTE) wards and episodes of new delirium. Results were presented to educate staff. Changes were made to our model of geriatric assessment, with increased involvement of geriatricians within the medical receiving unit and improved coordination of patient transfers by bed managers and elderly care specialist nurses.

Before the intervention, 60% of patients were admitted to more than three wards in a week, reducing to 12% post intervention. The mean number of wards admitted to fell from 3.6 to 2.6 and the incidence of new delirium reduced from 35% to 19%.

Within our second cycle, of the patients who developed delirium during admission, there were higher rates of pre-existing cognitive impairment, a higher mean number of delirium risk factors and a higher number of mean wards admitted to.

A combination of educating staff and increased input from geriatricians and specialist nurses 'at the front door', leads to a reduction in the number of ward transfers and reduces episodes of new delirium.

PB08
AMBULATORY ASSESSMENT ENHANCES PATIENT FLOW

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The aim of the Ninewells Hospital AMU Ambulatory Assessment Area (AAA) is to reduce ward admissions and improve patient flow. This is achieved by way of rapid assessment and timely investigation and management of patients presenting with acute medical conditions that can be safely managed as outpatients.

Patient journeys are completed within one attendance where possible and further investigations can be conducted on an urgent outpatient basis. The patient journey is further expedited by having protected radiology slots. The area is staffed by one senior nurse and one doctor of ST level or above.

We looked at the clinical presentations over a one-month period in the AAA between 24 June and 24 July 2013. Of the 209 patients seen in the AAA, only 14

patients (6.7%) required subsequent inpatient admission. During the same period there were 1,144 referrals to the AMU (including AAA referrals). A total of 17% of these referrals to AMU were therefore successfully managed through the assessment area without requiring inpatient admission.

Future plans to improve patient flow in the AMU include movement of the deep vein thrombosis (DVT) assessment service into the community, which will in turn provide capacity for non-DVT patients in the AAA (27% of the 209 patients were DVT assessments). Facilities for low-risk chest pain assessment are currently being developed within the AAA. The expansion of consultant numbers and presence will enhance the appropriate use of the AAA, further reducing unnecessary admissions.

PB09
BENEFITS OF AN ELECTRONIC ADMISSIONS BOARD AND BED MANAGEMENT SYSTEM

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In 2009 North Tees Hospital developed a bespoke electronic bed management system with the aim of increasing the efficiency from a paper-based system. User-defined filters allowed the selection of information most pertinent to individual roles: Administrative staff could focus on referral information; ward coordinators on bed allocation; and the admissions list ensured patients were seen in a clear and timely manner. A public and private view was incorporated to ensure compliance with information governance and patient confidentiality. This system also resulted in a number of additional benefits to patient flow and patient safety:

- Admissions board times how long patients have been waiting to be seen by a doctor are shown and a 'traffic light' visual prompts a highlight when they have waited longer than 60, 90 and 120 minutes.
- Users are able to redirect patients to ambulatory care before arrival.
- The data are fed into metric-driven analysis via the trust's intranet-based reporting system, allowing rapid and flexible interrogation of the data. Therefore the effect of any changes to staffing can be quantified and outliers investigated.
- All but one of the Society of Acute Medicine (SAM) clinical quality indicators are accurately and prospectively recorded.
- Anonymous logbooks of patients are compiled and seen by individual doctors as required for appraisal.

Given the relative low cost and clear advantages of this system, the authors feel electronic bed management should be endorsed by the Royal College and SAM for use in all acute hospitals.

PB10
MONY A MICKLE MAKS A MUCKLE – WHOLE SYSTEMS INCREMENTAL CHANGE TO IMPROVE FLOW

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Hairmyres Hospital has struggled to maintain patient flow over the past three years. This has manifested as an inability to consistently deliver the four-hour standard as well as long ED waits and boarding.

A series of clinically driven interventions has taken place over the past 12 months to improve the overall position with regard to flow. These interventions have included:

- Institution of a 'consultant of the week' model in the AMU;
- Initiation of golden hour ward rounds at peak periods;
- Additional weekend consultant rounds;
- Trial of allied health professionals working seven days a week over the winter;
- Alteration of junior doctor staffing patterns to meet demand;
- Establishment of an assessment bay adjacent to AMU, removing GP-expected patients from the ED.
- Establishment of a clinical decisions unit (CDU) for short-stay pathway management of medical conditions;
- Establishment of a discharge hub and integrated community support team to improve discharge management;
- Cardiology in-reach service to AMU and CDU;
- Streamlined approach to care of the elderly case finding by acute care of the elderly nurses and a revitalised rehab model.

This has resulted in a sustained upward trend in four-hour standard performance from a low of 73% in January 2012 to a position of 95% in July 2013.

PB11
DAILY CARDIOLOGY INREACH TO THE ACUTE MEDICAL UNIT – CASE FINDING AS A KEY TO FLOW

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Patients with cardiac conditions are a high-volume group of acute medical admissions. Improving flow for these patients has a significant impact on overall inpatient flow and a quality impact by discharging without unnecessary delay or achieving timely specialist review.

Flow from AMU/CDU to cardiology at Hairmyres Hospital was suboptimal. Patients inappropriate to cardiology were placed in specialist beds due to flow pressures. Flow was by active push, suitability assessed by AMU or CDU staff. Patients were frequently transferred late in day, only to be discharged early next day after review.

A trial of daily case finding visits by a consultant cardiologist to AMU/CDU was commenced in November 2012. A late-morning visit identified patients to pull using proforma or from AMU whiteboard.

An audit after 51 days of operation showed 163 referrals, an average of 3.2 per day. The referral origin was the acute medical receiving unit in 91 cases (55.8%) and the CDU in 72 cases (44.2%). There were two days with no referrals and eight days with more than five referrals. There were two 'inappropriate' referrals. There was a 52% direct discharge rate after review. The change has been fully adopted as the impact on flow has been recognised.

PB12
UNPICKING IMPROVEMENTS IN WHOLE SYSTEMS CHANGE: HARNESSING AN UNEXPECTED BENEFIT

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A major focus in our whole-systems approach has been the COTE flow. A series of changes have been used, including:

- Getting the right patient: Robust, clinically validated 'frailty' criteria enable case finding appropriate patients with acute care of the elderly (ACE) nurses to streamline the use of criteria.
- Maximising discharges: Ongoing work to foster closer hospital-community working via our integrated community support team.
- Improving pull: Departmental workload redesign

shifted some ward roles. One ward evolved from a 'long-term' ward to an acute assessment and rehabilitation ward. This ward has seen a 147% increase in admissions over five years.
- Abolishing boarders: 'Medical' boarders in COTE wards have been reduced to virtually zero. A change to give daily consultant input into all acute COTE wards allowed us to assume care for patients previously considered as inappropriately placed boarders.
- Improved liaison: For patients requiring specialty COTE input in medical wards we have developed a new ACE liaison model. An ACE nurse will review telephoned referrals, coordinating care including a consultant review (within 24 hours).

Focusing on COTE flow has played a major part in the sustained upward trend in four-hour standard performance from a low of 73% in January 2012 to a position of 95% in July 2013. It has also had the unexpected benefit of improved clinical engagement in flow as a system issue, making change easier.

PB13
TIMELY CARE FOR THE ELDERLY – ARE WE DOING ENOUGH? WAITING TIME TO FIRST MEDICAL ASSESSMENT IN A DISTRICT GENERAL HOSPITAL OVER 18 MONTHS

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Background: The Royal College of Physicians has recently lain strong emphasis on improving care for the elderly in the AMU. Data are lacking on the promptness of medical attention in the AMU for elderly patients.

Aims: We aimed to compare AMU waiting times between elderly (>65 years) and younger patients.

Methods: We collected data prospectively over 18 months for all patients referred to the AMU at Maidstone Hospital NHS Trust. We collected demographics, arrival time and time of first encounter with a doctor and referral source.

Results: We assessed all patients referred to the AMU from November 2012 to May 2013 (n=15,290). We calculated waiting times for 12,540 patients. Median age was 73.3 years (interquartile range 57.0–83.8); 51% of patients were women. During the day (9 am – 9 pm), elderly patients were significantly less likely to be seen under four hours, with an odds ration (OR) at 95% confidence interval (CI) of 0.77 (0.62–0.95), p=0.018; the difference was maintained with a one-hour target, with an OR at 95% CI of 0.87 (0.8–0.96), p=0.004.

During the night there was no significant difference between the two groups at four hours or one hour, with an OR at 95% CI of 1.15 (0.82–1.6), p=0.46, and 1.05 (0.9–1.24), p=0.5, respectively. With day and night referrals together, the difference at four hours did not reach statistical significance, with an OR at 95% CI of 0.85 (0.71–1.02), p=0.09. However, significant difference was found at one hour, with an OR at 95% CI of 0.92 (0.85–0.99), p=0.04.

Conclusion: Our results show that elderly patients are significantly less likely to be seen under four hours than their younger counterparts during daytime hours.

PB14
A VISION OF PATIENT FLOW – NOW A REALITY?

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Patient flow should be based around clinical need, not bed availability, and involve a multidisciplinary team working together to ensure every step in the patients' journey takes place in a timely manner, ensuring they receive the right treatment at the right time, in the right place. All staff required should be based in the admissions unit with diagnostics and downstream beds closely geographically related.

Initial assessment by an advanced nurse practitioner, assisted by a healthcare support worker, should occur within 45 minutes of admission. They should arrange basic investigations and initiate any immediate treatment the patient requires. Patients should be prioritised based on clinical need, measured using Scottish Early Warning Scoring (SEWS). Next, the patient should be fully clerked by a junior member of medical staff, within 90 minutes of arrival. Within three hours the patient should be reviewed by a senior decision-maker, along with results of all admission investigations.

A diagnosis or differential is made and an ongoing management plan outlined. Flow out of the unit should be on a set pathway based on clinical need and predicted length of stay and occur in a timely fashion. Downstream beds should be available according to predicted patient volumes.

In Aberdeen we strive to achieve this standard and 81% of our admissions are assessed and moved downstream within four hours. Mean time to senior review across all SEWS scores is 126 minutes (9 am – 9 pm). We have demonstrated a positive correlation between increasing SEWS and time to review both by junior and senior medical staff.

PB15
HOW DOES AMBULANCE DEMAND AND TRIAGE CATEGORY AFFECT OUR PATIENT FLOW? CAN WE INFLUENCE IT TO IMPROVE FLOW IN OUR DEPARTMENT?

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Our department has two main 'bulges' of admissions: 24% of our 24-hour admissions arrive between 1 pm and 3pm and a further 28% between 3 pm and 7 pm. The first bulge puts pressure on our ten-bedded admissions unit, compounded by the second more extended influx. We wondered if flow could be improved by working with the Scottish Ambulance Service (SAS) and GPs to even out the pattern of admissions or if we needed to adjust our workforce.

We examined SAS data over one week (26 March – 2 April 2013). In total, 248 patients were admitted, with 245 transported by the SAS. Overall, the SAS took 32% of its referrals from 10 am to 2 pm; 71% triaged as <2 hours and 78% <3 hours. From 2 pm to 6 pm the SAS took 26% of its referrals. Of these, 65% were triaged as <2 hours and 78% <3 hours. Average pick-up times per triage category are 36 minutes for <1 hour, 71 minutes for 1–2 hours and 87 minutes for 2–3 hours.

Therefore, taking into account lag for pick-up and transport to hospital, our peak times correlate with that of the SAS. Demand cannot be adjusted, but an insistence on a <3hr triage category for all our patients, along with improved communication to GPs with regard to our busy periods and guidance on appropriate triage categories for set conditions may even out the admissions over the day. Furthermore, we could adjust staff working times to match staffing levels to patient volume and increase our use of ambulatory clinics.

PB16
A NEW BUILDING DESIGN – HOW HAS IT AFFECTED OUR PATIENT FLOW?

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Aberdeen Royal Infirmary (ARI) opened its Emergency Care Centre (ECC) in November 2012. Patient flow was at the centre of the vision for the design of this building and since our move to the new facility, with a concurrent change in operational policy, we have seen a dramatic improvement in our service and flow.

Acute medicine was previously geographically isolated from downstream wards and diagnostics, and flow was dependent on bed availability rather than patient need. Around 11% of our patients were admitted directly to decant wards. We directly discharged 26% of our patients, often after a greater than 24-hour stay in the department.

The ECC co-locates accident and emergency, acute medicine initial assessment (AMIA) and its associated observation ward and short-stay medical unit (SSMU), all the general and specialty medical wards, geriatric assessment unit and high-dependency unit. In addition, the building houses radiology, out-of-hours GP service, the operational support hub and a pod system to transport bloods.

Flow out of AMIA is based on clinical need and predicted length of stay, around four main pathways – ambulatory care/home, observation ward, SSMU and specialties. Downstream wards, general and specialty, have to create requested beds and they have predicted, target discharge numbers each day.

In our old system, 78% of patients stayed in our department for >10 hours; now we assess, and admit to appropriate beds 81% of our patient within four hours. Our observation and short-stay units improve flow of the least unwell patients.

PB17
DASHBOARD FOR PATIENT EXPERIENCE IN ACUTE MEDICAL PATIENTS

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Customer satisfaction in the service industry depends on the customer completing his journey, stay and purpose of visit within expected standards. Patient stories highlighted experiences on similar principles, which could vary considerably, depending on many factors, such as seasonal pressure on resources. We looked at creating a patient dashboard that could reflect their experience and can be used repeatedly.

We involved patients to create this short feedback tool, based on factors that bring them most value. We asked them to rate their experiences based on their journey; hospitality; staff courtesy; their understanding of what was happening to them/family at every stage; whether they had any adverse events during their stay and their overall experience.

Our findings revealed that there was considerable variation in patient experience in a single day across the acute medical unit. In total, 50% of patients experienced moderate delays on their journeys; most patients found the hospitality to be excellent (70%); 90% found staff courteous; and only 50% of patients knew what was happening to them 'all the time'. None experienced any adverse events and 60% felt their overall experience was excellent.

We found that the major areas we needed to make improvements were in patient journey time, mostly attributed to delays in the initial journey from ED to the ward and in keeping patients informed about their investigations and treatment all the time. The findings have been displayed at ward level as a dashboard and we propose to repeat the exercise monthly and apply Lean methodologies to continually make improvements.

PB18
CHANGING CONSULTANT WORKING PATTERNS TO SUPPORT IMPROVED QUALITY OF CARE

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Timely senior clinical decision-making is key to safe, effective delivery of emergency medical care and critical to effective patient flow. Traditional working practices don't support optimum senior decision-making across the week.

Hairmyres Hospital is in the forefront of adoption of best practice as recommended by the Royal College of Physicians and SAM. In 2011/2012, the hospital adopted a clinically driven block day 'consultant of the week' pattern of receiving to enhance quality and continuity of care. The change was well supported by consultants and resulted in better support for junior medical and nursing staff. Direct discharge rate from AMU increased by 16.5%, compared with 2010/2011.

In the winter of 2012/2013, double consultant cover at weekends commenced; the second consultant available to review outlying patients and deteriorating patients outside the AMU. Care of the elderly consultants were present on weekends reviewing new referrals, supporting downstream wards, with allied health professionals working weekends to support discharge.

A number of consultants engaged in golden hour ward rounds to assist with daily review improved continuity of care and supported timely discharge and overall patient flow. These changes were partly instituted with additional winter funding and at the expense of some elective activity.

To sustain and spread beneficial working practices supportive to the seven-day hospital, further investment

is required to balance elective and emergency demand across the week and year and enable consultants to adopt innovative working practices.

PB19
ARE WE ENSURING SAFE AND TIMELY PATIENT CARE IN ACUTE MEDICAL PATIENTS?

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A recent audit in our hospital showed an increase in minor clinical incidents such as prescription errors and incomplete thromboprophylaxis risk assessments among acute medical admissions. We undertook a service improvement project in order to identify changes that can be made to deliver a safe and timely patient care.

We looked at all acute medical admissions over the month of January 2013, focusing on their distribution over a 24-hour period. We also looked at doctor-patient ratios and time taken by admitting medical doctors to assess patients following referral from ED (breach times).

There was a disproportionate rise in the average number of medical admissions in relation to the number of doctors in a 24-hour period, with 64% (n=7) of the four-hour breach times in clerking occurring during night shifts (9 pm – 8 am). Moreover, there was an upward trend in the average time taken to assess patients following a referral over a 24-hour period, with a difference of approximately 40 minutes between day (8 am – 9 pm) and night shifts (9 pm – 8 am).

The majority of our acute medical admissions occurred at night. Hence we proposed to increase the number of doctors during night shifts in order to improve doctor-patient ratios, thereby ensuring timely and effective assessment. This has been achieved in our hospital by reallocating a doctor from the evening to night shift.

We recommend that all hospitals should look into the distribution of doctors throughout the 24-hour period in order to reduce clinical errors and improve patient care.

PB20
FEASIBILITY OF A HOSPITAL AT HOME SERVICE IN WEST LOTHIAN: EVALUATION OF THE FIRST 100 PATIENTS ADMITTED TO A RAPID ELDERLY ASSESSMENT AND CARE TEAM

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Introduction: Increasing demand for healthcare and social services from elderly people has led to calls for unscheduled care to be delivered as near as possible to the individual's home while remaining safe and of high quality. This aims to reduce unnecessary hospital admissions for those more than 75 years of age (HEAT target). A Cochrane review of hospital at home services suggests home assessment can reduce mortality and increase patient and carer satisfaction (see Shepperd S, Doll H, Broad J et al. Hospital at home early discharge. *Cochrane Database Syst Rev* 2009; (1):CD000356). We describe a novel hospital at home service in West Lothian from May 2013.

Methods: Patients aged 75 and over referred for hospital admission to the medical assessment unit were offered assessment at home by the rapid elderly assessment and care team (REACT). Exclusion criteria were acute chest pain, stroke, suspected fracture, surgical abdominal pain and reduced conscious level. Patients were seen at home within four hours. Treatment was initiated, equipment provided and urgent social care commenced if needed. Follow-up was by visit or telephone. Patients were logged on a database collecting demographic data and outcomes.

Results: We describe the outcome data for the first 100 patients admitted to our service. A total of 26 patients required hospital admission at seven days and 43 had been admitted at 30 days (one electively to community hospital). Eight patients died within 30 days – three were palliative and died at home, this being their preferred place of death. Mortality was similar to that expected for age (>80 years) admitted to hospital in Scotland (10.05%, ISD Scotland). Advanced interventions included oxygen, intravenous diuretics, subcutaneous fluids and joint injections.

Conclusion: A hospital at home service is feasible, safe and well received by patients, carers and GPs.

PB21
UNDERSTANDING BED MANAGEMENT SYSTEMS – AN OBSERVATIONAL STUDY

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Introduction: NHS England aims to make efficiency savings of £20 billion by 2015. Acute trusts have prioritised active discharge planning and reducing average length of stay of acute medical patients. As part of this strategy, several acute trusts have heavily invested in bed management software (BMS).

Aims: The aim of this study is to describe the existing evidence and literature on the scope of use of BMS systems in the NHS, their availability and cost-effectiveness to trusts and guidelines surrounding their use.

Methods: Open internet sources and PubMed literature searches were used to identify the extent and range of software companies providing BMS systems to NHS acute trusts and the scope of their effects for acute medical patients.

Results: Most BMS programs used by the NHS are operating in a handful of acute trusts. Individual software products make claims including that they help to reduce length of stay, decrease re-admission rates, reduce hospital-acquired infections and improve financial efficiencies. However, there are no published data evaluating these programmes in terms of clinical practice and practical use.

Discussion: It is important to recognise and understand the influence of bed management or patient flow systems on clinical practice and outcome. Further work is needed on current and emerging trends in BMS, the extent of choice available to NHS acute trusts and the qualitative and quantitative metrics needed for meaningful evaluation.

PB22
SAFE DOMICILIARY CARE OF PATIENTS WITH SPONTANEOUS PNEUMOTHORACES WITH AN AMBULATORY HEIMLICH VALVE BAG TO IMPROVE PATIENT FLOW, PATIENT SATISFACTION AND REDUCE THE LENGTH OF HOSPITAL STAY AND HEALTHCARE COSTS: AYRSHIRE EXPERIENCE JULY 2012 TO JULY 2013

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Background: Estimates of annual incidences of spontaneous pneumothoraces (primary, PSP, and secondary, SSP) range from 16.7–40.7 in men and 5.8–15.6 in women per 100,000 in the UK (see Brims FJ, Maskell NA. Ambulatory treatment in the management of pneumothorax: a systematic review of the literature. *Thorax* 2013; 68:664–9). The majority are admitted for intercostal chest drain (ICD) attached to an underwater seal bottle. Length of hospital stay could range from five to >30 days. Domiciliary care (DC) of SSP and PSP with an ambulatory Heimlich valve attached to the ICD has potential for care closer to home, avoiding hospitalisation and saving healthcare resources.

Method: In the past year (since July 2012), we established a consultant-led DC service for PSP and SSP at the University Hospital Ayr, Ayrshire. All PSP and SSP admitted through the ED were assessed within 48 hours for potential DC with informed consent, based on presence of persistent air leak and predetermined Ayrshire criteria ensuring patient safety. Length of stay, bed days saved, complications, patient satisfaction and health economics of DC were formally evaluated.

Results: During this period, there were 24 pneumothorax presentations. Eight (33.3%) were discharged from ED. Ten (62.5%) of the 16 PSP and SSP admitted for ICD were accepted for DC as per the Ayrshire criteria. Eight (80%) completed DC; two (20%) required re-admission. Mean and median length of stay for ten DC patients were one and a half and one day, respectively. Mean duration on DC was six days (range 4–14 days), saving 59 bed days with cost avoidance of £26,432 at £448/day. There were no complications on DC and patients rated the service highly.

Conclusion: Carefully organised DC for PSP and SSP assists patient flow, is safe, cost-effective and meets with high patient satisfaction and approval.

Forthcoming events at RCPE

All events are held at the Royal College of Physicians of Edinburgh unless otherwise stated. All events are subject to change and further events may be added at a later date.

2014	
Respiratory Medicine Symposium	Thursday 20 March
Evening Medical Update: Limb pain/swelling	Tuesday 25 March
Ethics and care for older people approaching the end of life – Symptoms, Choices and Dilemmas Symposium	Thursday 3 April
Public Health: Use of evidence in health inequalities policy	Thursday 8 May
Dermatology Symposium	Thursday 15 May
Evening Medical Update: Poisoning	Tuesday 27 May

Programme details at: http://events.rcpe.ac.uk

Live webstreams of events

Selected events are webstreamed live to a number of venues around the world, including sites in Malaysia, India, Egypt, Jordan, Pakistan, Kenya, Sudan and Malta. If you can't attend or view the live-link, some web-streamed lectures are available to our Fellows and Members on the Online Education Portal.

If you are a Fellow of the College and are interested in setting up a link at your hospital or university, for full or part-days as suits local time, please contact Jeanette Stevenson, Head of Education, at **j.stevenson@rcpe.ac.uk**