UK Consensus Conference on Acute Medicine

November 2008

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Journal of PARAMEDIC PRACTICE

Emergency Medicine

Regents College, London 16th, 17th & 18th March 2009

Monday 16th March

- The current status and future of emergency medicine
  Dr Julian Redhead
- The changing role of paramedics
  Professor Malcolm Woollard
- Importance of education and training within the paramedic sector
  Lynda Sibson
- Impact of pre-hospital rapid response teams: findings from a pilot study
  To be confirmed
- Disaster medicine management
  Dr Tom Cosker
- Emergency medicine preparation for mass gatherings
  Dr Brian Robertson
- Emergency management of the unconscious patient
  Dr Gavin Lavery
- Assessment and management of patients with head injuries
  Mr Peter Whitfield
- Management of acute bleeding following trauma
  Dr Anil Hormis
- Emergency sedation and pain management for children
  Dr Daniel Wallis
- Management of anaphylactic shock
  Dr David Luyt

Tuesday 17th March

- Current issues in prehospital intubation by paramedics
  Dr Mark Bloch
- Effectiveness of the air ambulance service
  Dr Dhushyanthan Kumar
- New Technologies in CPR
  Dr Cathal O'Donnell
- Stroke: case studies
  Chris Bearne
- Cardiac arrest: case studies
  Mark Whitbread & Joanne Smith
- Sporting injuries: case studies
  Dr Bryan English
- Have 4 hour targets improved emergency care?
  Dr Suzanne Mason
- Evaluation of emergency care systems
  Professor Jon Nicholl
- Paediatric fevers
  Dr Ian Maconochie
- Practical management of suicidal/ self harming patients
  Dr Yogesh Ganeshalingam
- Do we know what people die of in the Emergency Department?
  Dr Farhat Mushtaq

Wednesday 18th March

- Impact of the Medical Admissions Unit (MAU)
  Dr Swapan Bhaumick
- Optimal prehospital care of emergency patients: how much time should be spent at the scene?
  Dr Anthony Bleetman
- EMRS and rural emergency care: a Scottish perspective
  Dr Alasdair Corfield
- Diabetic emergencies
  Stephen Trowbridge
- Obstetric emergencies
  Dr Tim Draycott
- Point-of-care testing
  Professor Christopher Price
- Role of the emergency nurse
  Nicholas Castle
- Benefits of an alcohol-liaison nurse
  Frances Mason
- Prevention and management of violence and aggression
  Dr Alex James

CONFERENCE FEE INCLUDES ENTRANCE TO THE CONFERENCE, LUNCH AND REFRESHMENTS, FULL CONFERENCE DOCUMENTATION AND CERTIFICATE OF ACCREDITATION

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Royal College of Physicians of Edinburgh

UK Consensus Conference on Acute Medicine

November 2008

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All reasonable precautions have been taken by the authors, editor and publishers to verify drug names and doses, the results of experimental work, and the clinical findings published in this supplement. The opinions expressed are those of the authors, and not necessarily those of the editors or publishers. The ultimate responsibility for the use and dosage of drugs mentioned in this supplement and in the interpretation of published material lies with the medical practitioners and the editors and publishers can accept no liability whatsoever in respect of any claim for damages arising therefrom. Please inform the editor of any errors.

Thursday 13 November 2008

09:25 Welcome
Professor David Webb, Vice-President, Royal College of Physicians of Edinburgh

Session One: What is acute medicine and do we need it?
Chair: Dr Chris Roseveare, Southampton

09:30 What is acute medicine?
Professor Bryan Williams, Leicester
09:50 Primary care
Dr Ken Lawton, Royal College of General Practitioners Scotland
10:05 Accident and Emergency
Dr Julian Redhead, London
10:20 Interface with specialty
Dr Veronica White, London
10:35 Discussion
11:00 Coffee

Session Two: What is the optimal configuration for multi-professional working in the acute medical unit?
Chairs: Dr Frank Westerduin, Paisley, and Ms Lynne Douglas, Edinburgh

11:30 What is essential? The optimal configurations?
Dr Solomon Almond, Liverpool
11:45 What do you need to sustain it?
Dr Liz Myers, Dundee
12:00 How do we deliver this service south of the border?
Ms Heather Lawrence, London
12:15 How do we deliver this service north of the border?
Dr Roelf Dijkhuizen, Aberdeen
12:30 Discussion
13:00 Lunch

Session Three: Ambulatory care – what is it and do we need it?
Chair: Dr Mairi Scott, Dundee

14:00 What is it?
Dr Ian Sturgess, Canterbury
14:15 Primary care perspective
Dr Andrew Cowie, Dundee
14:35 Risk assessment of complex needs patients
Mr Iain Duguid, Edinburgh
14:50 Development of ambulatory pathways to avoid hospital admission
Ms Liz Lees, Birmingham
15:05 Discussion
15:30 Tea

Session Four: How is multi-professional training optimised in the acute environment?
Chair: Mr Paul Martin, Edinburgh

16:00 Tension between training and service delivery
Ms Helen McKinnon, Edinburgh
16:20 What core skills and core competencies are required?
Dr Phil Dyer, Birmingham
16:40 Who should provide the training?
Professor Philip Cachia, Dundee
17:00 Discussion
17:30 Close of day one
17:35 Poster Viewing
(Panel and authors of abstracts only)
19:30 Conference dinner
Great Hall, Royal College of Physicians of Edinburgh

Friday 14 November 2008

09:00 Poster viewing and Coffee

Session Five: What are the appropriate standards for acute medicine?
Chair: Ms Jan Warner, Edinburgh

09:30 Why do we need standards for acute medicine?
Professor Derek Bell, London
09:50 What are the quality standards?
Dr Michael C Jones, Edinburgh
10:10 How do we measure them?
Dr Paul Aylin, London
10:30 Discussion
11:00 Coffee
11:30 Distribution of 1st draft of consensus statement

Session Six: Presentation of 1st draft of statement
Chair: Sir Alan Langlands, Chair of Consensus Panel

11:40 Presentation and open discussion of first draft
12:45 Lunch

Session Seven: Reflections
Chair: Dr Alistair Dorward, Paisley

13:45 How will this change my practice?
Dr Cliff Godley, Strathaven
14:05 Training for the future
Dr Hannah Skene, Nottingham
14:25 Paramedic view of pre-hospital care
Mr Stephen Hull, Stonehaven
14:45 What does this all mean?
Mr Roy Lilley, Camberley
15:15 Coffee
15:30 Distribution of 2nd draft of consensus statement

Session Eight Presentation of 2nd draft of consensus statement
Chair: Sir Alan Langlands, Chair of Consensus Panel

15:35 Presentation and open discussion of second draft
16:25 Closing Remarks
Dr Michael C Jones, Edinburgh
16:30 Close of meeting

Acute medicine is at the core of the NHS

The ageing population and the growth in numbers of patients suffering from long-term conditions demands an adequate response from the health service to provide care and support. This is particularly true when individuals experience an acute deterioration in their health: they have a right to expect prompt, effective treatment from competent clinicians who are properly equipped. This pressure on the NHS has been reflected in the increasing numbers of acute admissions to medical beds and the increasing percentage of acute bed days occupied by patients aged over 80 years. Recognizing the need to provide good care at the front door, the NHS looked for solutions and appointed a number of doctors to manage acute medical units. None of these doctors had been trained specifically for this task but, subsequently, training programmes were developed. However, the place of acute medicine remains the subject of debate.

The Royal College of Physicians of Edinburgh (RCPE), the Society for Acute Medicine and the Royal College of General Practitioners in Scotland convened this consensus conference to review important aspects of acute medicine, to consider how acute medicine fits in today's NHS and how the key principles for high quality patient-centred acute care should be defined. This is one of a series of conferences organized by the education department of the RCPE. The organizing committee set predefined questions to be addressed and commissioned expert authors to write peer-reviewed background papers. They appointed a multidisciplinary consensus panel, including specialist and lay members, and invited key speakers to discuss and debate these issues with an informed audience over 2 days.

The consensus panel presented two drafts to the meeting for discussion before producing a final consensus statement at the end of the conference. The statement asserted that the care of acutely ill patients is core business for the NHS; well-organized acute medicine has a pivotal role to play in improving patient care and outcomes; multi-professional working and strong clinical leadership are vital; and communication between all parts of the health and social care system is essential. Key challenges include the need to embed education, training and research in practice, to define standards for high quality care and to tackle issues of capacity and sustainability.

This supplement of the *British Journal of Hospital Medicine* contains the consensus statement, the background papers written for the meeting, the speaker summaries and poster abstracts. The success of the conference resulted from these contributions, 2 days of vigorous discussion and the efforts of the expert and hard-working consensus panel.

Michael C Jones
Consultant Acute Physician
Royal Infirmary of Edinburgh
Sir Alan Langlands
Principal and Vice-Chancellor
University of Dundee

MEMBERSHIP OF CONSENSUS PANEL

Dr Grant Archibald	Director of Emergency Care and Medical Services, NHS Greater Glasgow and Clyde
Dr Rhid Dowdle	Consultant Physician and Cardiologist, Royal Glamorgan Hospital, Llantrisant
Dr Alison Elliot	Lay Representative
Dr John Gaddie (Panel Vice-Chairman)	Consultant Physician and Former Medical Director, Melrose
Mr Alastair Graham	Pharmacist, Gloucestershire Royal Hospital
Dr Gavin Johnson	Specialist Registrar, St Barts and the London NHS Trust
Ms Sonya Lam	Director of Allied Health Professionals, NHS Education for Scotland
Sir Alan Langlands (Panel Chairman)	Principal and Vice-Chancellor, University of Dundee
Professor Alastair McGowan	Dean of Postgraduate Medicine, West of Scotland Region
Dr Paul McNamee	Senior Research Fellow, Institute of Applied Health Sciences, University of Aberdeen
Professor Jill Morrison	Professor of General Practice, University of Glasgow
Ms Theresa Murphy	Deputy Director of Nurses, London
Dr Kevin Reynard	Consultant in Emergency Medicine, St James's Hospital, Leeds
Dr Peter Rudge	General Practitioner, Plymouth
Ms Jennifer Trueland	Freelance Journalist

MEMBERSHIP OF ORGANIZING COMMITTEE

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Professor Derek Bell	Professor of Acute Medicine, Imperial College London
Mrs Christine Berwick	Consensus Conference Co-ordinator, Royal College of Physicians of Edinburgh
Mrs Margaret Farquhar	Consensus Conference Co-ordinator, Royal College of Physicians of Edinburgh
Dr Michael C Jones (Scientific Chairman)	Consultant and Clinical Lead in Acute Medicine, Edinburgh Royal Infirmary
Dr Liz Myers	Nurse Consultant – Acute Medicine, NHS Tayside
Dr Scott Ramsay	College Deputy for Consensus Conferences, Royal College of Physicians of Edinburgh, and Consultant Physician, St John's Hospital, Livingston
Dr Frank Westerduin	Consultant in Accident and Emergency, Royal Alexandra Hospital, Paisley

RCPE UK Consensus Statement on Acute Medicine, November 2008

KEY POINTS

- The treatment and care of acutely ill patients is the core business of the NHS.
- Well-organised acute medicine has a pivotal role to play in improving patient care and outcomes.
- Multi-professional working and strong clinical leadership are essential.
- Communication between all parts of the health and social care system is vital.
- Education, training and research should be embedded in practice.
- Key challenges include standard setting, capacity, sustainability, resources and breaking down professional and organisational barriers.

NHS professionals are working together to develop an integrated and coherent approach to providing medical and surgical services for people who require urgent treatment and care.

The aim is to improve the quality, effectiveness and safety of patient care, taking account of rising demand for emergency care, particularly for older people. Other challenges include the European Working Time Directive, changes in GP working hours, technological advances, increased patient expectations and practical and cultural barriers to change.

Acute medicine is a new specialty which has a pivotal role in improving pathways of care. Previously, care provided for acutely ill patients often involved delays in assessment, poor outcomes and many people staying in hospital longer than necessary. Early involvement of a specialist team led by senior clinicians and the development of dedicated acute medicine facilities improves quality and ensures rapid assessment, investigation, diagnosis and management.

Defining acute medicine

Acute medicine is that part of hospital medicine concerned with the immediate and early specialist management of adult patients suffering from a wide range of medical conditions requiring urgent or emergency care.

Authors/members of consensus panel: Langlands A (Chair), Dowdle R, Elliott A, Gaddie J, Graham A, Johnson G, Lam S, McGowan A, McNamee P, Morrison J, Murphy T, Reynard K, Rudge P, Trueland J

Key principles for high quality patient-centred acute medicine

From the information and evidence provided to the conference, we believe that the following principles should apply to the further development and effective delivery of acute medicine:

Multi-professional working

Teamwork and strong, well-defined and consistent clinical leadership are essential. All members of the team should have respect for each other and their skills and work together across professional boundaries:

- Good communication is vital at all points on the care pathway; this includes working with the primary care team before and after the hospital episode, involving patients and carers, and linking effectively with other hospital teams and support services
- The team should include consultant physicians, nurse specialists and other professional staff including dedicated pharmacists, occupational therapists and physiotherapists, all of whom should be competent or training in acute medicine
- Timely support is required from other services including social work, psychiatric and alcohol liaison, and critical care outreach
- Dedicated porters, clerical and domestic staff are an important part of the team
- Administrative support is required to manage the flow of patients through the acute medicine system. This should be tailored to provide maximum support for clinicians.

Essential relationships

Acute medicine must work closely with other health and social care services to develop patient pathways which ensure effective assessment, diagnosis and management:

- Access arrangements to acute medicine should be clear and well communicated, particularly to primary and community care and emergency services
- Alternatives to hospital admission should be fully explored, including the use of urgent outpatient referrals, intermediate care, ambulatory care, palliative care and end of life care
- Discharge co-ordination is a core activity and should be managed effectively
- Key partners include emergency departments; co-operation and co-location are desirable; there should be joint guidelines, compatible IT systems and a single assessment document
- Rapid access to imaging, laboratory tests and other diagnostic services is crucial and should be available seven days a week to inform treatment and facilitate discharge
- There should be timely involvement of other specialist teams, clear arrangements for the transfer of care and equitable access to high dependency care
- Patients, carers and the public should be involved in the design of services and the development of education and training initiatives.

Education, training and research

Acute medicine, with its diverse mix of patients, provides a rich environment for education and research:

- All staff should have protected time for learning and access to appropriate training technologies and resources
- There should be a local champion, with expertise in education, responsible for multi-professional education and training in acute medicine
- There should be a wide range of educational opportunities to develop and maintain a workforce that is competent, skilled and up-to-date. These should include case reviews, morbidity and mortality meetings and simulation training
- Supervised practice with effective feedback must be embedded in day-to-day working
- Competency frameworks and the development of transferable skills should build on the work already undertaken by the health departments and professional bodies
- The practice of acute medicine should be supported by a strong evidence base derived from research. Other clinical and health services' research activities should be encouraged in the acute medicine environment.

Standards of care

There is early evidence that patients treated through an organised process of acute medical care achieve better outcomes. It is important that existing good practice is distilled into agreed standards and performance measures:

- Hospitals should have operational policies for acute medicine which explain the organisation of services and their inter-relationship with other parts of the health and social care system
- Explicit standards must be set for acute medicine, including rapid assessment, the development of patient pathways, ready access to diagnostic services, treatment and effective discharge arrangements
- Specific standards must be agreed to ensure effective working with other specialist teams
- A standardised early warning score should be recorded, monitored and used to trigger appropriate action for all patients
- Best practice and national guidelines on medicines reconciliation must be followed
- The performance of acute medicine should be monitored using key performance indicators such as mortality and morbidity data, discharge and readmission rates and patient experience surveys
- Clinicians working in dedicated acute medicine facilities should be competent in providing high dependency care
- The development of patient services, standard setting and performance monitoring should be supported by good information management and IT systems.

Key challenges for the future

Good progress has been made in developing acute medicine as a specialty in its own right. Looking forward the key challenge will be sustainability – matching capacity to demand, securing resources for extended seven-day working and the co-location of services, codifying standards of care and striving for true multi-professional working and educational provision to improve patient outcomes and experience.

What is acute medicine and do we need it?

There have been many attempts to define the precise nature of acute medicine; the one that is favoured here comes from the Acute Medicine Task Force report from the Royal College of Physicians of London (2007). The report defines acute medicine as:

'that part of general (internal) medicine concerned with the immediate and early specialist management of adult patients suffering from a wide range of medical conditions who present to, or from within hospitals, requiring urgent or emergency care.'

This definition recognizes that the acute physician has a role to play in the management of acutely ill medical patients, whether they present from the community or whether they are already inpatients in a hospital setting. The latter part of this statement will only be universally achievable when there are adequately staffed acute medicine teams available within the acute hospital setting across the country. But why should such teams develop? Part of the answer may be given by looking at the similarities between the role of the hospitalist in the USA and the proposed acute physician. In the USA, the presence of trained hospitalist physicians has been associated with decreased mortality rates and shortened length of inpatient stay (Wachter and Goldman, 2002). Similar evidence is now starting to emerge in the UK and Ireland (Moloney et al, 2005; Moore et al, 2006; St Noble et al, 2008).

This evidence goes some way to addressing the question: 'Do we need acute medicine?' Developments that improve patient care and maximize the effective use of NHS resources have to be regarded as beneficial. The case for acute medicine is compelling in terms of patient safety, staff training and experience, and improving the efficiency of patients' pathways for those presenting with acute medical illness. As these individuals represent the single largest group of patients requiring an unscheduled admission, optimizing their care will have a beneficial effect on the functioning of hospitals as a whole.

The evolution of acute medicine

From the early 1990s onwards there was increasing recognition that acute medical admissions were proving challenging in terms of the management of hospital resources in relation to both staffing and clinical outcomes (Bell and Redelmeier, 2001; Cram et al, 2004). From this time, concerns were raised about patients being scattered throughout the hospital, with the associated difficulty of staff managing these individuals adequately. This issue was particularly pronounced overnight and at weekends and was often compounded by long 'safari' ward rounds.

While these problems still exist, many hospitals now coordinate the acute medical take more effectively. To improve the service being offered, many hospitals and trusts began to employ individual doctors to take an active role in medical admission units, now termed acute medical units (Royal College of Physicians of London, 2007). The grade of doctor initially employed varied between staff grade and consultant. This grade is now moving towards consultant acute physicians in most hospitals, and hospitals with an acute medical unit will often employ between two and three acute physicians, although in some units this can be as many as eight.

The growing need for acute medicine was also reflected in the effort that the Royal Colleges put into investigating the best way for services to be organized (Royal College of Physicans of Edinburgh and Royal College of Physicians and Surgeons of Glasgow, 1998; Federation of Medical Royal Colleges, 2000; Royal College of Physicians of London, 2004). In the report led by Professor Carol Black (Federation of Medical Royal Colleges, 2000) it was acknowledged that there should be physicians responsible for the running of acute medical units, but that each of these should have an additional specialty. During the accumulation of evidence for this report, clinicians of various grades from across the UK were invited to a meeting with Professor Black to provide information about how their services functioned and the resources required to deliver safe and efficient care. This meeting acted as a catalyst for the group to share ideas and concerns, and from it the Society for Acute Medicine evolved.

The group espoused the ethos of acute medicine as being the delivery of care by a multi-professional team to meet the needs of the patient presenting with unscheduled medical illness. The development of this multi-professional component of care was seen as essential to ensure patients' needs were identified at the point of entry. The aim was to provide clearly defined patient pathways, organization of and medical leadership within

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the acute medical unit, and rapid access to a senior clinical decision-maker. It was agreed that such units could only thrive if the medical specialties provided a close link, with the clear acknowledgement that patients with specialty-defined illnesses are best cared for by specialty, both in terms of length of stay and outcome (Provencale et al, 2003). With the development of acute medical units staffed by a dedicated acute medicine team, it has been possible to show that early assessment by a senior decision-maker minimizes delays in investigation, reduces length of stay and ensures liaison with other specialists (Moloney et al, 2005; Moore et al, 2006; St Noble et al, 2008). Furthermore, acute medicine is essential to the proper functioning of an acute hospital as 50–60% of inpatient activity is of an emergency nature; improving the efficiency of management of this group of patients benefits both the patient and the overall system. Acute medicine provides this better management.

Since the working party group first met, the Society of Acute Medicine has been founded as a multiprofessional organization that promotes better patient care by encouraging cooperation between the various disciplines and specialties necessary to optimize patient pathways. In addition, the society looks to set standards for care: to this end it has already generated guidelines for nursing staff and allied health-care professionals within acute medical units, available from its website (www.acutemedicine.org.uk). This latter aspect of the society emphasizes the importance of the contribution from all members of the team. The development of new roles, including nurse consultants, in acute medicine and dedicated AHP teams within acute medical units has been vital to delivery of the improved outcomes for patients that are now associated with acute medicine.

Acute medicine itself is now recognized as subspecialty of general internal medicine (Joint Royal Colleges of Physicians Training Board, 2003), and ongoing work offers the hope of its evolution to full specialty status. Specialists in acute medicine continue to be appointed, and the society has over 300 trainee medical specialists registered as members. Trainees in acute medicine are also taking advantage of the acute medical setting as an ideal clinical training environment and are being formally trained in medical education. Moreover, many undergraduate courses now have defined periods in acute medicine as part of the curriculum.

Increasing the focus and evidence base

The evolution of acute medicine means that the focus of the specialty is also enlarging. The increasing availability of ambulatory care associated with acute medical units emphasizes the importance of delivering care in the setting that is most appropriate for each patient. Care that has been delivered in an inpatient setting is increasingly available in outpatient settings, and includes the management of deep venous thrombosis, pulmonary embolism, minor gastrointestinal bleeds and infections such as cellulitis, pneumonias and many cases of chest pain (Connolly and Hamad, 2008; Strang, 2008).

The need for a firm evidence base for much of what occurs in acute medicine is undoubted. Many interventions have been identified within specialty settings; for instance, the need for active intervention in acute myocardial infarction has been based on research by acute cardiologists. In many acute medical conditions the role of the new acute medicine specialists will be vital in working either independently or with other specialties to provide an increasing evidence base for the management of acute illness. One recent example of this is the management of sepsis. While most acute medical units are not equipped to fully implement all the recommendations of the sepsis bundle (McNeill et al, 2008), further work is being conducted collaboratively – supported by acute medicine, intensive care and emergency medicine – to fully establish which components of the care bundle are truly required for improved patient outcome.

The delivery of an adequate evidence base is predicated on the development of an academic base for the specialty. Although acute medicine as an entity has developed from need and enthusiasm, there are many research questions and opportunities that should prove challenging for the members of the acute medicine team of the future.

Conclusions

Acute medicine has been established as a result of demands that clinicians should be available to cope with patients suffering from acute medical illness. The Royal Colleges and the Society for Acute Medicine have supported this thrust but have also acknowledged the need for formalized training and an adequate infrastructure. The role of clinicians involved in acute medicine is still evolving, but the need for this service is now indisputable both in terms of patient survival and improving hospital efficiency (Rooney et al, 2008).

Conflict of interest: none.

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Optimizing multi-professional working in the acute medical unit

Hospitals across the UK differ in size, function and the disparate services that are offered within them. It is not surprising therefore that one size does not fit all in the design of acute medical units. The exact geographical configuration, professional activity and operational policy of the acute medical unit will depend on local circumstances, including available resources, demand for the unit and services on offer.

There are some intuitive principles for the design of an acute medical unit and others based on direct evidence, both of which have been demonstrated to benefit patient care. They include early senior doctor review and patient allocation to the most relevant specialty (Moore et al, 2006). Many other developments are being implemented on the basis of an emerging body of knowledge and expertise in acute medicine, including an increasing emphasis on ambulatory care. The breadth of the evidence base available in acute medicine, however, is not yet as extensive as it is for more established specialties.

Configuration of the acute medical unit will be considered in terms of geographical structure, relationships with crucial interface specialties and the deployment of the workforce. Medical and nursing perspectives will be considered as well as the crucial roles of allied health-care professionals.

Structure of an acute medical unit

The geographical structure and infrastructure of an acute medical unit is to a great extent dictated by local circumstances. The advent of new-build private finance initiative (PFI) hospitals (privately funded capital hospital developments), while subject to much criticism (McCloskey, 2002), has allowed a review of acute medical unit design. Hitherto, acute medical unit development has been subject to the confines of existing structures and thus compromise, whereas PFI developments have facilitated a more bespoke construction (Department of Health, 2007).

As the acute medical unit primarily receives patients from the emergency department and, in many cases, direct from GP referrals, the ideal location should be near the 'front door' of the hospital. Co-location with or close proximity to the emergency department allows for seamless patient transfer to the acute medical unit, with the associated advantages of efficient movement of patients and bed management. The common functions of the two departments and efficiencies of staff flexibility are also facilitated by co-location. There is no doubt that isolation of the acute medical unit from other key departments such as radiology can also have a detrimental effect on efficiency and patient flow.

When patients are received in the acute medical unit directly from the community without passing through an emergency department, there should be easy and well-described access pathways to the acute medical unit for ambulance staff. This is essential, especially if the important immediate patient assessment function found in many acute medical units is to be sustained. Such an assessment facility will, of course, have a bearing on the geographical structure of the unit. If the acute medical unit has an outdated and probably ineffective simple admission role, a traditional ward structure (e.g. a series of bedded bays) may serve adequately. If, however, an assessment area is developed, this will often necessitate a shorter stay area, perhaps equipped with trolleys or seats. When the acute medical unit takes admissions directly from the community there are associated demands for the introduction of an adequately staffed reception area with waiting and changing facilities. While an active acute medical unit is likely to have developed an assessment facility, it is recognized that this is not universal. Whichever model is available locally it is mandated that there should be sufficient staff work stations (Department of Health, 2003). This is important to ensure that there are areas for documentation to be completed and for clinical handovers to occur effectively.

In practice, most acute medical units have found that a combination of facilities is useful, given the wide range of presentations from the walking worried to the critically ill. Thus beds, trolleys and outpatient consultation facilities may be available within a single acute medical unit. It is, of course, imperative that immediate access to resuscitation facilities is available for patients who arrive in an unstable state. The unit's layout will depend on the local environment, but a combination of bays and single rooms is desirable. The availability and use of single rooms has been influenced significantly by the need for robust infection control and the move to an increased number of single rooms is inexorable (Dowdeswell et al, 2004). This trend must be monitored, however, as the effect on patient satisfaction, medical staff and overall clinical outcome remains unclear (Van der Glind et al, 2007).

In terms of the acuity of illness and patient dependence, it has been recommended that acute medical units should be equipped with facilities for level 2 care (Royal College

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of Physicians of London, 2007). Implicit within this is the need for cardiovascular and respiratory monitoring and the staff with the relevant skills to support these acutely ill patients. This must be accompanied by adequate training for the acute medical unit nursing and allied health-care professionals in addition to in-reach from critical care with specialist teams (such as respiratory nurses trained in non-invasive ventilation) as appropriate. Thus the layout of the acute medical unit for the future should include a bay or other defined area where patients with significantly adverse physiological parameters can be managed.

Interfaces and co-locations

The operational policy of the acute medical unit needs to facilitate effective communication with other services and departments, including the emergency department, radiology, downstream wards and primary care. In addition to the natural location of an acute medical unit in proximity to the emergency department, there are other key departments that can be beneficially strongly linked to the acute medical unit. These services include critical care, radiology and acute surgical services. The mutual benefits of these adjacencies lead to the concept of the 'emergency area'. Further development of this concept allows for flexibility of staff and bed assets, dependent on demand and cross-specialty working. Thus an emergency department physician could admit a medical patient directly to an acute medical unit bed and the acute physician could discharge a self-presenting patient with a suspected medical problem after a nurse triage in emergency department. These types of changes within professional boundaries are still challenging but are evolving and are essential for robust multidisciplinary working.

The co-location and interfaces with other services will in part dictate the operational relationships with other departments and which functions the acute medical unit can sustain.

The interface with diagnostic services, especially radiology, merits specific mention. Strong functional relationships are crucial for both clinical governance and safe and efficient patient flow. This is a specific area where clinical information technology can be effectively used to request and report radiological investigations and thereby provide strong audit trails and smooth patient pathways. In common with most emergency department departments, acute medicine services need rapid access to both laboratory and radiological investigations to make clinically robust decisions. The ambition of every acute medical unit must be to provide a sound clinical diagnosis rather than simply exclude serious disease. To that end there must be a strong link between the acute medical unit and diagnostic services to ensure that when investigations are requested results are received promptly and action is taken to provide appropriate targeted treatment. The acute medical unit policy documents should reflect such an approach, even though there is a lack of a strong evidence base in this area.

Medical manpower deployment

The greatest asset of the NHS is its staff, who account for approximately 70% of its overall budget. It has been suggested that many areas of underperformance in the NHS could be addressed by improved staffing, but the challenge facing medical manpower by August 2009 is stark, when junior doctor hours will be cut from 56 hours to 48 hours per week in accordance with the European Working Time Directive (EWTD) (Bloor et al, 2006). This 20% reduction in junior doctors cannot be neutral with direct effects on the ability to deliver compliant rotas to staff an acute medical unit, both within normal working hours and out of hours. This is also likely to have an adverse effect on training. The reduction in junior doctor time will necessitate changing roles for other multidisciplinary team members to maintain adequate governance arrangements. These challenges are beyond the scope of this paper, but the Department of Health is sponsoring a number of pilot projects to address the issue.

The precise staffing level needed to cope with emergency work is to an extent unpredictable, although overall workloads are less subject to variation than previously thought. There tends to be a significant out-of-hours component, notwithstanding a slightly reduced workload in the night hours. In association with the complexity of diagnosing and managing admissions, which uses up a lot of medical staff time, staffing levels have to be able to cope with peak demand. Additionally, the flourishing quality agenda is continually driving the demand for consultant involvement in acutely ill medical patients' care. A consultant review within 24 hours of admission is now being mandated (National Confidential Enquiry into Patient Outcome and Death, 2007). Indeed, there is a burgeoning call for consultants to be on the shop floor of the acute medical unit for at least extended days.

Staffing patterns have to be skewed towards robust senior cover; outside of the extended working hours, there must be senior cover available at least by bleep for any hospital receiving unselected medical patients. This increasing involvement of senior cover on the shop floor has to some extent underpinned the expansion of the acute medicine specialty. It seems almost inevitable that this expansion will in time lead to an increasingly consultant-delivered service in the spirit of the 2000 white paper (Department of Health, 2000). It is not yet clear whether this will result in a trained acute physician being continually available within the hospital, but the presence of a senior physician within the acute medical unit has obvious advantages for patient care and supervision of trainees.

A phased reduction in the unsocial hours commitment across the career of acute medical unit physicians may be possible. In the interests of patient safety and expert management of acute illness, it is likely that many of the acute specialties will also have to follow this route. Indeed, the need for 24/7 senior cardiology availability for intervention when an acute myocardial infarction has been diagnosed is one area where this move is already

occurring. Similar schemes within acute medicine are very likely to be required to ensure a clinically safe and effective service throughout the year.

Whatever the precise hours of senior cover available to an acute medical unit, it is useful to map medical manpower to demand. The typical profile of demand requires the most robust cover from early afternoon until late evening. As part of the solution to the EWTD, the Royal Liverpool University Hospital has recently redesigned the junior doctor cover to provide most staffing at these times with three 9-hour shifts in a 24-hour day. Dispensing with on-calls and grouping together 2 weeks of acute shifts in 'hot block' has allowed for 2009 compliant rotas (www.healthcareworkforce.nhs.uk/liverpoolbroadgreenpilot/). While this process has not been without difficulty and awaits formal evaluation, solutions to the EWTD are necessary for many trusts.

Nursing

Over the past 10 years acute medicine has evolved as a distinct specialty for medical staff. This is not the case for nursing, with acute medicine being regarded by some as a hybrid between accident and emergency nursing and general medical nursing. As a result, the knowledge and skills required of the nurse in the acute medical unit may not be recognized by managers. The Society for Acute Medicine is seeking to address this problem by developing a national competency framework. The knowledge and skills required of these nurses are broad and encompass many of the specialist skills in other areas because of the wide range of medical and specialty conditions they encounter (Royal College of Physicians of London, 2004). The environment is dynamic and challenging, with nurses required to work well under pressure to maintain quality of care and effective patient flow.

The Royal College of Physicians of London (2007) report emphasized the importance of appropriate training for medical staff, and this is equally true for nursing (Royal College of Physicians of London, 2004). This was highlighted further by the report of the Acute Medicine Task Force, which emphasized the importance of teamwork to provide integrated care with the appropriate level of competency. Staffing levels in acute medical unit are affected by several factors, including patient acuity, turnover, number of monitored beds and ward design. The addition of ambulatory care areas and systems of direct admissions will also increase staffing requirements. It is therefore not possible to be prescriptive about staffing ratios.

The Society for Acute Medicine (2004) and the Acute Medicine Task Force (Royal College of Physicians of London, 2007) have both emphasized the importance of senior medical and nursing clinical leadership in the acute medical unit. Several units have appointed consultant nurses to provide leadership and support to the ward manager/lead nurse and the nursing team. The consultant nurse role is multi-dimensional, combining expert practice with education, research, service development and leadership (Manley, 2000). Thus the role is clinically based and strategically focused with a key aim to facilitate the development and support of nursing roles (Higgins, 2003).

Teamwork obviously extends beyond professional groups. It is equally important that dedicated porters, cleaning and clerical staff are provided to ensure effective patient flow and to allow nurses to concentrate on nursing tasks (Royal College of Physicians of London, 2004).

Pharmacy

There is significant evidence to support the role of the specialist clinical pharmacist in the acute medical unit. On admission to secondary care, before intervention by the pharmacists, 64% of medicines have been reported to be unreconciled, potentially resulting in errors in prescribing (Audit Commission, 2001; Scottish Executive, 2002). This is an important patient safety issue with the potential to affect clinical outcomes and the patient journey significantly. The role of the specialist clinical pharmacist includes providing pharmaceutical advice and prescribing support to the multidisciplinary team to ensure treatment follows best practice and local guidelines. The pharmacist is also responsible for taking an accurate drug history and for ensuring that reasons for withholding or stopping medicines are recorded. This helps to prevent iatrogenic complications and may reduce the likelihood of re-admission related to medication.

Redesign of pharmacy roles has been recommended to release pharmacist time for this specialist role (Scottish Executive, 2002). In many areas, pharmacy technicians have taken over roles relating to assessing patients' own medication and arranging the supply of non-stock medicines. They are often involved in arranging supplies of discharge medication and facilitating supply of compliance devices in the community.

Allied health professionals

The well-documented increase in emergency medical admissions of older people is an important determinant of the composition of the multidisciplinary team (Royal College of Physicians of London, 2004). Older people often present with complex problems linked to the loss of functional ability. Intervention is required not just for the presenting medical problems but also for assessment and restoration of function and independence (Ellis and Langhorne, 2005). The roles of the physiotherapist and occupational therapist are therefore central to the appropriate assessment of older people in the acute medical unit, where early goal setting is an important element of service delivery. There is a paucity of research demonstrating evidence of best practice, perhaps as a result of the relatively recent advent of acute medical units in some hospitals. However, evidence relating to emergency admission of older people suggests that assessment should take place as early as possible, depending on the patient's medical stability (Royal College of Physicians of London, 2005). Joint assessments by physiotherapists and occupa-

tional therapists are recommended to reduce duplication of assessment and increased efficiency. Physiotherapy assessment should include an assessment of gait, balance and power (Ellis and Langhorne, 2005). Measurement of functional outcomes, particularly for falls, is important, but further research is required to select the most appropriate measure. There is some enthusiasm from senior physiotherapists to develop a competency framework and best practice guidelines for assessment in acute medical unit (personal communication). The Society for Acute Medicine has recently published draft occupational therapy guidelines recommending standards for appropriate occupational therapy assessment in the acute medical unit (www.acutemedicine.org.uk/Guidelines/ohguidelines.htm).

Access to speech and language therapists and dieticians is necessary on an as-required basis. However, nurses should be trained to provide a basic swallow assessment so that patients are not unnecessarily deprived of food and fluids out of hours.

Specialist roles

Patients with learning disabilities or dementia are particularly vulnerable when admitted to an acute medical unit. The combination of unfamiliar staff, strange environment and communication difficulties often causes increased anxiety and distress and can make appropriate assessment and treatment difficult. Although nurses and other staff need to have the skills to deal with these patients effectively, specialist liaison roles can offer support and guidance in patient management and discharge planning (Department of Health, 2004). The detection of harmful and hazardous drinking is an important part of assessment in the acute medical unit (Royal College of Physicians of London, 2001). Specialist alcohol liaison nurses are a useful resource to provide education and support for these patients.

Discharge planning and patient flow

Effective patient flow through the acute medical unit is a key component of ensuring safe and effective practice. Plans of action should be in place in the event of insufficient beds being available. A robust bed management system is required to prevent patients being placed at clinical risk by boarding to inappropriate beds (Royal College of Physicians of London, 2007). Proactive discharge planning is central to the management of patient flow and effective use of bed capacity. Many medical patients are simple discharges, for whom an expected date of discharge can be set within 24 hours of admission. Such proactive discharge planning can free capacity to ensure it matches demand for beds. A knowledge and competency framework has been developed to help nurses and allied health professionals to authorize discharge according to defined criteria, often facilitating discharges earlier in the day (Department of Health, 2003). Coordination of the discharge process and multi-agency planning involving patients and carers are important to ensure that there are neither gaps nor duplication in service provision (Department of Health, 2003).

Conclusions

This article has presented suggestions for the optimal configuration of an acute medical unit, while recognizing that design and staffing are often dictated by local circumstances. Multi-professional and cohesive teamwork is crucial to the effective management of an acute medical unit, and the roles of different professionals have been highlighted. There are certain core requirements for all acute medical units that have been described. However, it has been acknowledged that as yet the evidence base in acute medicine is weak.

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Ambulatory care: what is it and do we need it?

This article cannot be an exhaustive review of all current evidence for ambulatory emergency care; such a review would assume that this model of care is fully developed, which as yet is not the case. The challenge is to design safe, innovative and effective approaches to manage acute illness by developing appropriate risk assessment tools and monitoring systems to optimize patient outcomes and minimize length of hospital stay. The primary purpose of this article is to create debate and promote innovation combined with rigorous evaluation for the further development of ambulatory emergency care, thus identifying both appropriate conditions and guidelines for a diagnosis-specific model of cost-effective 'best care'.

An analogy to the development of ambulatory emergency care is the introduction of day-case surgery for elective care over the last 50 years. Day-case surgery developed as a result of innovations by individuals who were prepared to test its feasibility. However, the early days of day surgery were beset by challenges regarding the safety around such interventions. Today, day-case surgery is considered the norm for many surgical procedures, and the original 'basket of day-case surgery' has grown to become the Directory of Procedures from the British Association of Day Surgery. There are clearly differences, however, between day-case admission for definitive surgical therapy in a generally ambulatory, 'well' patient cohort, and the often non-specific presentations of many (often elderly) medical patients who require a thorough history and examination before due consideration of appropriate investigations.

What is 'ambulatory emergency care'?

The Royal College of Physicians of London's (2007) Acute Medicine Task Force has produced a working definition:

- Ambulatory care is clinical care which may include diagnosis, observation, treatment and rehabilitation not provided within the traditional hospital bed base or the traditional outpatient services that can be provided across the primary/secondary care interface.
- In the context of acute medicine, it is care of a condition that is perceived either by the patient or by the referring practitioner as urgent, and that requires prompt clinical assessment undertaken by a competent clinical decision-maker. The health-care setting may vary, but for optimal clinical care will often necessitate prompt access to diagnostic support.
- Ambulatory care must be high-quality care, designed to ensure the best outcomes for patients. It is the responsibility of those delivering this care to ensure that resources are deployed in the most cost-effective manner.

Ambulatory emergency care as a concept needs to be separated from 'ambulatory care sensitive' conditions, which are defined as those conditions in which chronic disease management programmes or preventative measures can reduce the frequency with which acute episodes occur. This management occurs earlier in the patient's care journey than ambulatory emergency care. The ambulatory care sensitive conditions also include diagnoses in which prompt urgent care for the early phase of illness can and does bring about prevention of emergency or unscheduled presentations, such as cellulitis. With ambulatory emergency care, the patient has an acute presentation or deterioration and the process is designed to evaluate whether that acute episode can be managed without the use of an acute bed.

However, despite the funding of £1.6 billion for initiatives to reduce hospital admissions for ambulatory care sensitive conditions in 2007 alone, there has been a 3% yearly increase in such admissions since 1997. The reasons for this are unclear but could be explained by an increasingly elderly population and the consequent increase in chronic disease, or simply wide variations in standards of care. Moreover, ambulatory care sensitive conditions are often forced into unscheduled care pathways, making them indistinguishable from truly unpredicted unscheduled care need.

Fundamentally, while ambulatory emergency care and ambulatory care sensitive conditions are separate processes, they are not mutually exclusive. If both can be delivered with the same or better quality of patient outcome and experience, the requirement for acute hospitalization will fall.

Emergency care activity

Emergency care in the UK is facing a number of challenges, some of which are based around policy development within devolved structures. What is clear is that the increasing demand on emergency services over the last few years, with rising emergency admissions across both

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Scotland and England. However, this trend has also been associated with a reduction in the length of stay for all ages over the last decade. There have been suggestions that some of the increase in admissions since 2002 is in part related to the 4-hour accident and emergency target (*Figure 1*), but these changes precede this objective.

Figure 1. Annual emergency admissions in England, 1998–2006.

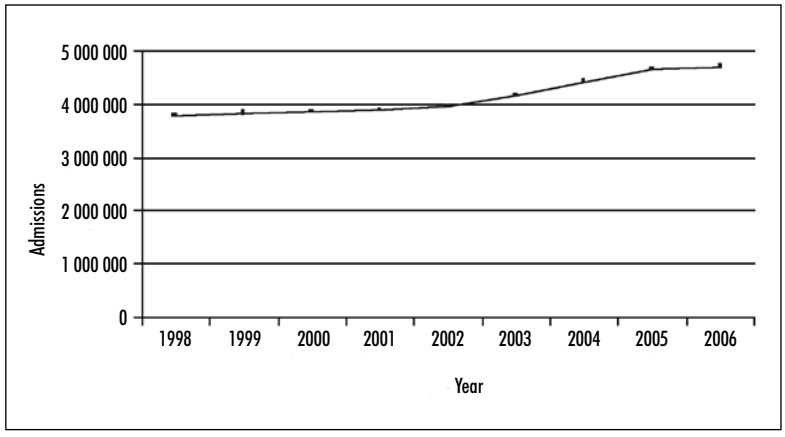


Figure 2. Demographic changes in the UK population, 1911–2004, with projected changes to 2041.

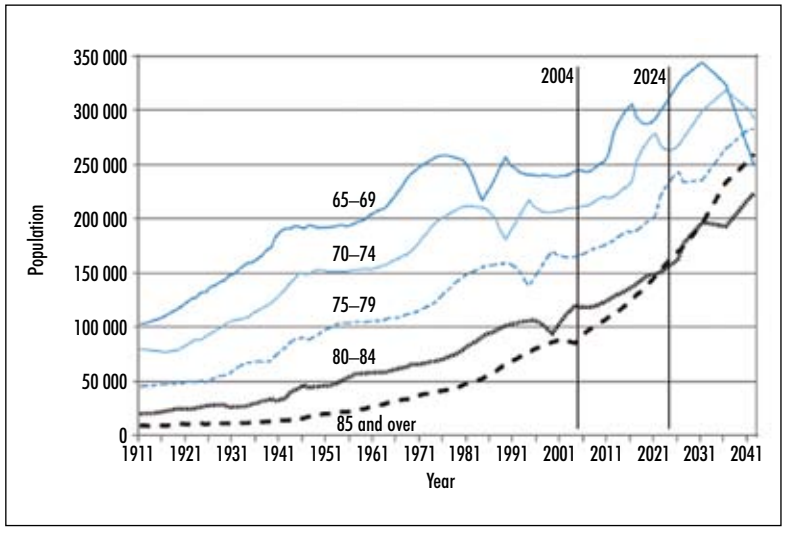
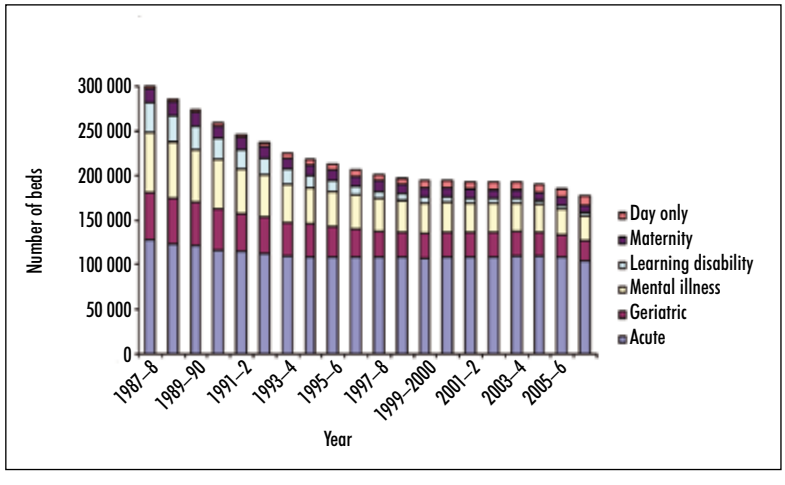


Figure 3. NHS bed numbers in England, 1987–8 to 2006–7.



Conversely the increase may reflect the 'admission' of patients under specialty teams who were seeing and managing these patients in emergency departments in which this activity was not previously counted except under an accident and emergency attendance.

With the demographic changes demonstrated and projected in *Figure 2* an increasingly older population has and will result in pressures not only on acute services but also on community health and social care services. In addition, adding to the pressures on emergency beds, has been the reduction in bed numbers across the NHS (*Figure 3*). With surgical bed numbers falling at a faster rate than those of medical beds, as a result of the significant shifts of elective surgical work to day-case surgery, the risk of outliers of medical patients in surgical bed bases has increased, with the resultant risks of increased length of stay and decreased quality of medical care. Thus, surgical capacity and medical and surgical patient care is acutely compromised by this influx of medical patients, to the detriment of the wider community.

Length of stay has been progressively falling, and a number of structures and processes have been put in place to stream patients according to length of stay as well as clinical need. The development of acute medical units with short-stay facilities aim to standardise and raise the quality of initial assessments and decision-making, and to support patient flow by streaming those individuals with an expected short length of stay to facilities specifically geared to rapid turnaround of patient care. The development of shortened care episodes, focused around the necessary interventions for patients, has resulted in major transformations, not only for the experience of patients but also their outcomes. For example, day 3 discharge after successful primary percutaneous coronary intervention for patients with normal ejection fraction is becoming the norm.

Current ambulatory models of emergency care

Ambulatory emergency care for children is a well-established model in paediatrics, which recognizes the rapid recovery from acute illness in children with the immediate availability of a support and monitoring structure from parents.

In adults, ambulatory emergency care has evolved in a relatively random manner, with various specialties developing pragmatic models with published observational studies as the mainstay of evidence for these pathways. What is now becoming increasingly accepted is that disease-specific diagnostic and therapeutic interventions are the major determinants of satisfactory outcomes for patients, rather than bed-based waiting for these interventions.

The care of deep vein thrombosis has been transformed by the introduction of low molecular weight heparins, enabling ambulatory care to become the norm

for patients with this condition. There is much published evidence to demonstrate the safety and efficacy of such a model of care, although there are still some patients who are admitted unnecessarily.

In contrast, patients with suspected pulmonary embolism often occupy an acute bed for 24–48 hours while waiting for the mandatory computed tomography pulmonary angiogram, and then remain in hospital for 3–5 days until therapeutic warfarinization is achieved. The questions which need to be asked are:

1. Why are patients waiting for diagnostic imaging for pulmonary embolism beyond the day of presentation?
2. How do we align our diagnostic services to be delivered in real time to support ambulatory care?
3. How do we risk-stratify effectively using clinical risk scores supplemented by cardiac biomarkers to assist in the appropriate selection of patients for ambulatory care?

While ambulatory care of pulmonary embolism may seem a radical step, it is likely that considerable numbers of patients with this condition, which may or may not be clinically overt, are already being managed 'safely' through ambulatory deep vein thrombosis services.

Recent data suggest that many infection-related illnesses could be dealt with in the community, including the majority of acute ear, nose and throat infections, cellulitis and community-acquired pneumonia. Community-acquired pneumonia in particular has clear national guidance relating to admission criteria, although the requirement for a 'same day' blood urea test and chest X-ray may limit this.

Ambulatory care: the future?

The safe and effective delivery of ambulatory emergency care, with appropriate evaluation of outcomes, is the innovation challenge for the relatively new specialty of acute medicine. To optimize care and patient experience we need to move from the isolated management of individual conditions to a dedicated system of ambulatory care for medical conditions. A more effective model of ambulatory care can only be achieved with an integrated approach across primary and secondary care which uses, wherever appropriate, specialty skills both within and outwith the hospital to provide the necessary support infrastructure.

The reconfiguration of the delivery of acute medical services via acute medical units, and the increasing numbers of specialist acute medicine consultants and trainees, will undoubtedly assist this process. Earlier involvement and decision-making in the patient journey by appropriately trained senior clinicians will hopefully result in higher patient turnover with fewer delays in diagnostic testing.

Beyond acute medicine, however, limitations in the secondary care infrastructure need to be overcome to facilitate more efficient diagnosis, therapy and discharge. Access to diagnostic testing, and in particular radiological imaging, is paramount to the efficiency of ambulatory care and early discharge. The engagement of radiology departments and a commitment to 24-hour service provision is undoubtedly required. Moreover, access to early outpatient follow-up, either through open access appointments to an acute medical unit follow-up clinic or easier referral to specialist hospital clinics, is mandatory. Finally, the appropriate early management of any deterioration of coexisting conditions – as well as of the acute 'exacerbation' – through early specialist multidisciplinary assessment and case management during and beyond the acute hospital stay is necessary to improve the quality of outcomes.

A shift from the concept of ambulatory care equating to immediate discharge is also required. In reality, ambulatory care should be a phased discharge process; some patients and, indeed, conditions will allow for immediate discharge from the emergency room with follow-up outlined above. Assessments of illness severity, co-morbidity, disability and social support are all important in supporting decision-making in short-stay emergency care.

The institutionalized, the frail and the elderly may require a day or two to have both their medical and social issues resolved. However, the assumption that these patients cannot be managed using this process denies them the opportunity of undergoing rapid management of their acute problem. This group may also necessitate investigations and/or treatment being taken to the individual in the care home. This would require advanced care planning in conjunction with the patient, the family, the care home and primary care and mental health services, but can have positive outcomes in terms of reduced morbidity and mortality while significantly reducing hospitalization. Technological advances in the 'remote monitoring' of physiological parameters may facilitate this process in the future for these and other patient cohorts, and considerably widen the potential opportunities for the development of ambulatory emergency care.

There is little apparent doubt that both patients' expectations of their journey and their physiology allow for early discharge, and that such a process is cost effective. In 2004–5, there were 4 428 680 emergency admissions to acute hospitals in England. Of these, 932 123 had a length of stay of zero (an episode of care without an overnight stay), suggesting that these patients are amenable to alternatives to acute care. By reducing the length of stay of 1–2-day-stay patients by an average of half a day, savings of at least £195 million can be made. In addition, there are potential health benefits: each extra day's stay potentially creates a 5% risk of avoidable harm such as hospital-acquired infection. Finally, the patient experience is enhanced by virtue of patients' preference to remain at home and avoid an NHS hospital stay.

Conclusions

By developing safe alternatives to (bed-based) inpatient hospital admission through ambulatory emergency care strategies, we can maximize patient choice and flexibility. As a result, our inpatient beds are more readily available for those patients for whom hospitalization is necessary.

The development of ambulatory care in the UK requires an integrated infrastructure across primary and secondary care which uses senior medical, hospital and community specialist nurses and ancillary staff. Uncoupling the necessity for an overnight hospital stay from the requirement for a therapeutic intervention is a key paradigm shift: the term 'admission' should not just equate to an overnight stay but also to a brief stay of several hours with intensive investigation and therapy facilitating prompt discharge. The financial incentives of the development of ambulatory care relating to early discharge, short 'admission' durations and the improvement in patient experience should drive further research evaluation and innovation to identify appropriate conditions and models of 'best care'.

Conflict of interest: none.

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How is multi-professional training optimized in the acute environment?

The importance of excellent clinical training cannot be overemphasized as we strive to deliver acute clinical care that is effective, efficient and safe. To deliver this we should determine the best possible training pathways and, as the Tooke report reviewing the implementation of Modernising Medical Careers correctly indicates, we should be 'aspiring to excellence' (MMC Inquiry, 2008).

The acute clinical environment, in the form of the acute medical unit, provides a number of opportunities to deliver excellent multi-professional training, namely:

- An ideal setting to promote the ethos of multi-professional training
- Exposure to a diversity of patients and clinical conditions with a plethora of physical signs
- Access to many of the hospital's investigative and treatment resources
- The requirement for high levels of performance from the multi-professional team to achieve optimal patient care.

As such good quality care has to be the ultimate aim it is imperative that the training available provides adequate experience for trainees to prove they have acquired the various competencies relevant to both specific professions and to all members of the multi-professional team.

This article addresses key perspectives that determine how multi-professional training may be optimised in the acute environment:

- Securing adequate funding
- Agreeing a common set of values
- Exploration of the barriers to learning
- Patient safety standards for training
- New and evolving roles interfacing with medicine
- Identification of core competencies and strategies that promote multi-professional learning.

Securing adequate funding

The importance of achieving robust training and assured competency acquisition is recognized centrally; a series of white papers has described the future of acute hospital services in terms of redesign, improved efficiencies and increased productivity, each with a common theme – to create a workforce fit for purpose (Department for Education and Skills, 2003; Department of Health, 2002, 2004, 2005). This can only be achieved where the redesign of services is planned in consultation with education and training providers (Roberts, 2007).

Multi-professional training needs a sustained funding stream and defined training pathways, rather than being over-reliant upon ad-hoc training provision incorporated into the clinical time of busy practitioners. Furthermore, it is increasingly difficult to release staff from the acute environment so that the benefits of non-work-based training are being closely scrutinized in practice (Griscti and Jacono, 2006). The place of training within the acute medical unit needs to be prioritized. The recognition of training roles within job plans has to be mandated, with adequate provision of training and time for those roles. The time for capable but untrained 'amateurs' in the training arena is over.

A powerful mechanism to prioritize training in the acute medical unit could be through the creation of directorate training strategies with responsible lead individuals. The accountability for educational funds would follow this. Training decisions would, thus, be delivered right to the door of clinicians and address clinical training priorities. The inextricable links between training provision and corporate risks from the risk register, key performance indicators and patient complaints have to be recognized. If this recognition is achieved multi-professional training would undoubtedly assume increased importance within the service delivery sectors of the NHS to the benefit of patients and, indeed, the staff (Royal College of Physicians of London, 2007). This should not detract from general workforce training plans which address training needs across an organization rather than focus on training needs to acquire a unique skill set within the rapidly changing acute medicine service. One way forward would be to agree a common set of values to which core multi-professional training could be aligned.

Agreeing a set of common values

Evidence regarding work-based learning suggests that staff must also share a common set of values to fully achieve inter- and multi-professional training opportunities. Moreover, an educational strategy that emphasises the commonalities across different roles will have a positive influence (Guest et al, 2002). Some suggestions of common values for the acute medicine environment (Royal College of Physicians of London, 2004, 2007) are outlined below:

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- Responding to acutely ill medical patients in a timely and effective manner, by providing an acute medicine service that facilitates rapid patient assessment, investigations and treatment
- Managing patients' needs proactively, by constructing a multi-professional management plan and ensuring it is appropriately executed by members of the acute medicine team
- Managing capacity to facilitate the flow of acutely ill patients. Within 24 hours of admission, all patients should be given an estimated date of discharge which takes into account multi-professional assessment and responsibilities
- Placing acutely ill patients most appropriately. Through good clinical decision-making skills patients should be cared for in the most appropriate environment, either within the acute medical unit or in specialist inpatient beds
- Collaborative working with other health and social care organizations, through good ward organization and communication to transfer patients seamlessly to other provider services, such as intermediate care.

Exploration of barriers to multi-professional training

Despite the above values there are inevitably going to be barriers to successful multi-professional training. Clinical training and learning are influenced by two key issues in an acute environment: the time sensitivity of the workload and the multiple conflicting commitments of the team (Hoffman and Donaldson, 2004). Three further aspects that draw a clear distinction from an acute environment to an acute medical unit are the unpredictability of the daily workload, the inconsistency of day-to-day staffing levels and the turbulent care environment. The reality of managing medical emergencies and multiple admissions, often at the same time, has consequences for multi-professional training in the workplace. It will limit group (possible multi-professional) teaching activities by constraining the numbers of staff who can be freed to participate in training at any one time.

The culture of learning within the acute medical environment will significantly influence whether learning opportunities are regarded as positive. This culture is determined by the quality of clinical leadership, with senior professionals being responsible for playing a key role in influencing positive learning experiences and, in particular, role modelling (Allan et al, 2008). The latter is most commonly understood in relation to student learning and mentorship, but in this case the charge nurse's and consultant's leadership roles have responsibility across the multi-professional team. This example can, of course, be extended to all health-care professions and examples are found both within and between professions (Lakasing, 2006; Roberts et al, 2002).

For most of the professions multi-professional training is a relatively new and evolving concept, although in many universities there has been a move towards sharing certain aspects of training between medical and nursing students. The vast majority of nurses and doctors, however, have experienced traditional programmes where each profession is educated as a unidisciplinary entity. It is also clear that exposure to multi-professional training after registration may be challenging, especially if such training is carried out in a traditional manner rather than along holistic lines. The emergence of new roles, however, has demonstrated that the skills between the professions are becoming increasingly similar and sometimes overlap. This may result in a 'convergence of roles' leading to the further development of multi-professional teams and multi-professional learning, and could also lead to conflict and disputed territories (Roberts, 2005). It is important that the latter is avoided and individuals are given the opportunity to maximize their competencies no matter what their professional background.

Finally, attention must be given to nurturing multi-professional team relations so that a positive, unified 'team' culture may be developed. This is even more critical each time there is a change of junior doctor cohort on the acute medical unit and on the arrival of new permanent nursing staff. This contrasts with an increasingly worrying 'shift culture', where staff have no sense of belonging within the unit and have no sense of common values (Guest et al, 2002). In this case, multi-professional induction programmes should point out the values espoused and available training opportunities to give staff a sense of purpose and unity. Staff also need time to develop a mutual understanding through exploration and debate. This would enable them to share ideas and thoughts freely when potential revisions in service provision, clinical protocols and patient pathways are required (McCormack, 2001).

Competencies

While the importance of multi-professional training and working for optimal patient care is recognized, there are specific requirements for each profession. Trainees in acute medicine have to prove competency in the clinical aspects of care, as defined by the three levels in the acute medicine curriculum, as well as meet the criteria determined by the generic curriculum (Federation of Royal Colleges of Physicians, 2007a,b). The latter covers aspects of attitude, care, communication, teaching, professionalism and legal awareness that are associated with competencies required by all physicians on their completion of training. This curriculum is divided into two levels that separate expectations of the more junior trainees from those more senior. Within the generic curriculum are specific competencies associated with teamwork, respecting the disparate members of the health-care team and recognizing the skills that each member of the team brings to patient care and management. Similarly in the acute medicine

curriculum there are multiple references to the importance of recognizing the impact of non-medical team members and the need for a multidisciplinary approach to care. As these aspects of care are highlighted in the curricula, improvements in joint professional training should be more easily achieved and opportunities in the acute medical unit identified.

Competencies that have previously been an exclusive province of the medical profession have been extended to other members of the multi-professional team. To this end the acute medical unit often has examples of professionals extending their competencies, e.g. advanced clinical skills in nurses and allied health-care professionals that can lead to nurses and allied health-care professionals managing their own clinical load from the time of presentation to discharge and pharmacists acquiring prescribing competencies and rights. It is therefore pragmatic to share training opportunities. Team working is further extended within the 'Hospital at Night' teams created to provide comprehensive care for overnight hospital patients. Such teams are usually made up of trainee doctors of various grades and senior nurses, which often have enhanced training suitable for these independent roles. The importance of this experience has already been recognized within medical training as a valuable opportunity as long as there is effective handover and team coordination at the end of each Hospital at Night period (Federation of Royal Colleges of Physicians, 2007b).

Patients presenting to the acute medical unit suffer from a broad range of conditions with a rich mix of clinical symptoms and signs. Furthermore, the age of patients can range from immediately post-pubertal to centenarians. Optimal patient management must still be based on basic clinical skills. It is therefore vital that the art of clinical medicine with recognition and interpretation of symptoms and signs and subsequent action by investigation and treatment is well supported in the acute medical unit. This is not to be achieved, of course, at the expense of losing sight of the patient as an individual and the multiplicity of needs that each individual may experience outside of his or her immediate medical condition. This is best exemplified by the many patients who present to the acute medical unit suffering from an exacerbation of their long-term condition. While there will be undoubted medical needs, the patient's associated psychosocial concerns should not be ignored or minimized. For these to be recognized, however, the training of all multi-professional team members must include these critical elements.

New and evolving roles interfacing with acute medicine environment

New roles interfacing with acute medicine are developing at each stage of the patient's pathway; specifically community matrons and assertive case managers are relatively new concepts. Within the domain of both roles are three key objectives, an understanding of which will optimize multi-professional learning opportunities:

1. To facilitate admission prevention for what are typically known as 'revolving door patients'
2. To facilitate earlier discharge, reducing length of stay for patients where greater primary and intermediate care support can assist
3. To manage the whole patient case on a long-term caseload.

It can be seen that these objectives broadly align and complement the values of an acute medical environment, such as an acute medical unit. The learning opportunities for such new roles are incredibly rich and are already supported by the Department of Health in conjunction with Skills for Health, which have jointly devised a set of national competencies for case management (NHS Modernisation Agency, 2005). This was followed rapidly by the early development of a postgraduate qualification (Fulbrook and Cockerell, 2005). While written by nurses the competencies are transferable to other professional groups, focusing specifically on collaboration between primary and secondary care services.

As roles in each health-care profession have evolved, an understanding of the importance of each profession's role has also changed. Within the acute medical unit the necessity of close working relationships provides an ideal opportunity for each member of the multi-professional team to gain a full understanding of the competencies and skills that each of the relevant professions can provide. Furthermore, opportunities to learn and understand the roles of other professionals within other and perhaps disparate sectors of health care could also be used to promote better patient care pathways.

The recently published acute care competencies (Department of Health, 2008) recognize the blurring of traditional boundaries and the importance of defining the competencies that are required to deliver high quality care in the acute setting. These guidelines have been written by a group with representation both across the professions and the medical specialties. Within this document the responses to an acute situation are not primarily defined by the profession of the practitioner but by the competencies that the individual has acquired. Thus an individual may be a recognizer or recorder of a patient's condition in certain circumstances or a primary responder in another, depending on the competencies required in the situation. This framework recognizes that individuals can acquire competencies that are relevant to optimizing patient care and do not necessarily conform to traditional professional boundaries (Department of Health, 2008).

Multi- and inter-professional training opportunities

Blurring traditional professional boundaries is only one part of the changes taking place to provide integrated services between emerging organizations. Nurses, doc-

tors, social workers and advanced care practitioners in the community are increasingly working together to achieve integrated care plans and optimize the outcome for the patient. This has promoted inter-professional training opportunities between health professionals and social care to achieve a greater understanding of the others' role in patient care (Howarth et al, 2006). Again, the magnitude of organizational and professional change that has already occurred cannot be underestimated, nor should the new opportunities for multi-professional training be missed. Ultimately if we are to optimize fully the acute environment for multi-professional training we must embrace the design of posts with collaborative employment opportunities across acute, primary and intermediate care settings. Standardizing policies, procedures and protocols to support training in each setting would be an excellent starting point.

Identification of multi-professional core skills and competencies

Inevitably the acute medical unit can, and should, be called upon to host skills-based learning required as new or enhanced roles, such as physician's assistants (Woodin et al, 2005), extended role physiotherapists, nurses learning to prescribe and assertive case managers, develop (Burke, 2006). All of these roles may contribute to comprehensive patient assessment in the acute environment. The core skills for these activities have been identified from a variety of initiatives. Important within this is assessment, risk stratification and an associated graded response for the acutely ill patient. There are, however, a number of disparate assessment and scoring systems and although the National Institute for Health and Clinical Excellence (2007) recognized the importance of systems such as the Modified Early Warning system (MEWs), it did not suggest their standardization. Further work is being pursued to try to obtain general support for a standardized system so that training in one environment will be easily transferable to another.

The following core skills within the acute medical unit are being acquired by many of the multi-professional team, albeit at differing levels by disparate practitioners:

1. Venepuncture (and blood results interpretation)
2. Arterial puncture (and arterial blood gas interpretation)
3. Cannulation (and aseptic technique)
4. Electrocardiogram recording (and interpretation)
5. Chest X-ray and abdominal X-ray request (and interpretation)
6. Clinical examination skills
7. A structured system of assessment (ABCDE and MEWs).

Examples of this include the acquisition of skills 1 and 3 by nurses in mandatory post-registration training, whereas many members of the acute care team – including physicians' assistants, extended role physiotherapists and senior nurses – are undertaking training for core skill 2. It has been suggested that the acquisition of skills 5 and 6 as part of an advanced assessment programme should be used to support compliance with the European Working Time Regulations (Fulbrook and Cockerell, 2005) as trainee doctors' hours of working become even more curtailed.

While these are popular skills-based competencies, other learning, especially understanding the complexities of 'leading a team', 'change management' and 'decision making', is essential to the functioning of an acute medical unit. To this end, the contribution of management staff to learning opportunities must also be considered within the remit of multi-professional education (Mallik and Hunt, 2007).

Patient safety

It is acknowledged that the provision of quality patient care is the most important overall objective, but the prospect of a patient being seen by someone in training may be perceived to be at odds with patient safety. The solution to this lies in adequate clinical supervision with recognition and recording of progression through defined levels of competency. To optimize training opportunities, safely trained practice educators or clinical supervisors must be available and used to support learning. Such posts are well supported in the literature, as they are highly visible and spend time in practice with practitioners to support and respond to training needs at a local level (Gallen et al, 2007). The importance of these roles is such that there is increasing recognition that specific training and time need to be allocated to them (Nursing and Midwifery Council, 2006; NHS Education Scotland, 2008).

In some situations, however, there is a need for other approaches to supplement traditional forms of training. This may take the form of simulation, using both low and high tech simulators to mimic physiological aberrations in ill medical patients, or scenario-based teaching aids available online. One example of this is the ACUMEN project in acute medicine, sponsored by the Department of Health and the Federation of Royal Colleges of Physicians, which uses realistic scenarios that mimic real-life patient presentations and from which trainees may compare their performance with a trained clinician. This type of scenario-based learning provides a safe environment in which trainees may test their ability to manage a clinical scenario without any risk to the patient or, indeed, the doctor or nurse (Howatson-Jones, 2004; Ruiz et al, 2006). In addition, dynamic and static scenarios within a clinical skills training room, using either surrogate patients or an advanced patient manikin, are being increasingly used for multi-professional training days. Examples of this are the ALERT programme (Acute Life-Threatening Events Recognition and Treatment) or the IMPACT (Ill Medical Patient Acute Care and Treatment) course. In each of these, patient scenarios are presented that aim to stretch the

boundaries of the trainee's usual clinical knowledge, challenges the acquisition of new competences and thus increases an individual's ability to take extra responsibility. The multi-professional nature of these training programmes can help promote respect for the role of other professionals in the clinical environment.

Standards for training

The need for standards in acute care is mimicked by the need for standards in training for all professionals involved in acute care. Supervision of trainees from across the professions is time-consuming and demands a defined set of competencies. These must be recognized and job plans modified accordingly to ensure that the trainees of today become the well-educated and trained acute professionals that deliver optimal care to the acutely ill patients who present to them. In recognition of a need for a standard for nursing, the Nursing and Midwifery Council (NMC) (2006) has developed a standard to support the learning activities and assessment of such in practice. This has far-reaching consequences for mentors, practice teachers and teachers, who are now required to map existing skills to teach and train or retrain appropriately. For the first time one unified framework will be used to assure the standard of assessment from students to advanced practitioners.

Within the medical profession the development of curricula and the associated assessment blueprints, which were subsequently approved by Postgraduate Medical Education and Training Board, have closely defined the required competencies both within the foundation years and in all of the medical specialties, including acute medicine. The further development of knowledge-based assessment in acute medicine to be taken by more senior trainees recognizes that patients have a right to be treated by a practitioner with an evaluated and appropriate level of applied knowledge. The validation of acute environment-based assessment methods to supplement assessment by the more traditional summative examinations has been actively pursued (Postgraduate Medical Education and Training Board, 2007). There are, however, no defined standard qualifications within the UK for the competencies that should be available within the multi-professional team working within an acute medical unit. This is in distinct contrast to the emergency and critical care departments but is a discrepancy that should be recognized and addressed.

In optimizing the acute environment for multi-professional training the Agenda for Change framework should not be overlooked (Department of Health, 2004). The NHS Knowledge and Skills Framework details six core competencies expected of all health-care professionals (although this framework is not strictly applicable to doctors) and identifies a further 24 specialist competencies required, depending upon the role. Most importantly, as echoed earlier in this paper, the NHS Knowledge and Skills Framework advocates that the posts required should 'reflect the requirements of the post and not the abilities or preferences of the person occupying that post'. Although the NHS Knowledge and Skills Framework is extremely broad, it is a multi-professional development tool to be used during planning, review and development of individuals and their role in line with service development and training.

Universities are also keen to capitalise on the opportunity to assure standards for multi-professional education while maximising work-based learning programmes. In particular, inter-professional education programmes are gradually being accredited at Masters level, albeit in individual modular form (Fulbrook and Cockerell, 2005).

Strategies to optimize multi-professional learning opportunities in the acute environment

The strategies listed below are not unique to the acute environment, but by tailoring the teaching activities used to align with the values defined by the unit and the choice of assessment strategies the impact can be maximised (Guest et al, 2002).

Self-directed learning combined with active reflection

This learning opportunity has the advantage that it can be engaged in at any time. Within nurse education programmes it has perhaps been over-used. Nevertheless, it is valuable and should not be disregarded (Johns, 1995). This is not just 'thinking about cases and events' but must include 'action on reflection' where the trainee must actively review the issues raised by the particular learning scenario to enable the cycle of learning to take place. Action on reflection can facilitate the opportunity to share learning at group sessions within a multi-professional activity.

Case conferences

Owing to the multi-disciplinary nature of care in an environment of older people, case conferences have tended to be viewed as their domain. It should be remembered, however, that the majority of patients admitted to acute medicine are also over 65 years old and, where complex patient cases prove challenging, this is a collaborative opportunity for learning to take place.

Ward rounds

Ward rounds are integral to the functioning of many acute medical units and can provide a critical learning activity, particularly but not exclusively for trainee doctors. The training opportunity here must not be underestimated, but ward rounds must also not detract from adequate patient care. The key to maximizing the potential learning captured from these is to ensure they are organized in a systematic and sustained manner, thereby gaining multi-professional engagement.

Multi-professional learning sets

Learning sets are most commonly used for clinical leadership training (King's Fund, 2008). They often require external facilitation and a significant level of commitment from the members. They are under-used in practice areas but are useful to address conflict between professionals and can improve the workplace culture.

Mortality and morbidity meetings

In many units these meetings have been an exclusive reserve of medical staff. If, however, such meetings are facilitated and well organized, they can provide an ideal regular forum for multi-professional learning. In particular, the regularity of such meetings allows for small incremental 'no blame' changes to identify and improve areas of clinical effectiveness and clinical governance. These meetings should not be confused with reporting of critical incidents that should be through the organization's clinical governance structure.

Rotational opportunities

Trainee doctors undertake training programmes that facilitate experiential learning in a series of different settings. For other health-care professionals such opportunities are much rarer after organized programmes have been completed. There is, however, ample opportunity to organize rotational posts, from the point of recruitment. This capitalizes on the learning opportunities found within the acute environment, including opportunities to update members of staff who have remained static in a post over a number of years (Kolb, 1984). The availability of such opportunities may help to promote staff retention. Accident and emergency, high dependency and acute medical unit have commonalities – the acutely ill patient – but the approaches to care are different.

Professional roles to promote training and practice development

These may include a variety of titles, according to profession, including practice developer, clinical educator or supervisor, educational supervisor and multi-professional educator. These individuals enable planning of training programmes, 'on the job' learning and small group activities and provide clinical supervision and mentorship. They can allow educators and professionals to explore structured ways of bringing evidence and practice together. This can include appraisal of the available literature from a background of appropriate clinical practice (Seymour et al, 2003). Experience would suggest that to be successful these posts must not be built into the clinical staff establishment. Otherwise they would be subsumed as part of the team and the educational objectives would, ultimately, be diminished. For medical training these points have recently been supported by Postgraduate Medical Education Training Board, which has determined that all educational roles should have appropriate training and specific time for this activity.

Conclusions

The acute medical unit has not been used optimally for training within the multi-professional team, although the clinical opportunities undoubtedly exist. Many universities are now recognizing the potential of these areas for the undergraduate teaching of multi-professional teams.

The importance of acute medicine in the medical postgraduate arena has been partially recognized with the inclusion of training in this subject for all medical trainees undertaking a formal training programme in any of the acute medical specialties. There are, however, a number of steps that still should be taken to optimize the acute medical unit as a learning environment:

- Securing adequate funding
- Agreeing a common set of values
- Exploring the barriers to learning
- Ensuring patient safety standards for training
- Taking into account new and evolving roles interfacing with medicine
- Identifying core competencies
- Devising strategies that promote multi-professional learning.

Unlike the critical care and emergency department areas, there are not specific training structures and qualifications in acute medicine for the multi-professional team. We believe that this must change, but for this to occur tackling the issues highlighted within this article is of critical importance.

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What are the appropriate standards for acute medicine?

In the UK, patients admitted to hospital with an acute medical problem will in general be seen, assessed and treated in an acute medical unit during the early phase of their care. Standards of care in acute medical units have largely been derived from the local hospital level. As such, there are no current agreed standards or performance indicators other than those that apply to the generic aspects of good clinical care or are disease specific, such as 'door to needle time' for acute myocardial infarction (Department of Health, 2000). There are also no performance targets that apply to acute medicine, although in Scotland, unlike England and Wales, the '4-hour' emergency department access target also applies to trolleyed areas within acute medical units (Scottish Executive, 2004).

Acute medicine has been developed to improve the quality of care for patients and provide a better environment for staff managing unselected medical emergencies. As is often the case, such developments have preceded the establishment of agreed standards and performance characteristics. Although partly ameliorated by more consistent clinical practice, this important issue has been highlighted by two bodies of work which have discussed standards for acute medical care. The Unscheduled Care Collaborative Programme, working with NHS Quality Improvement Scotland, has developed quality standards for unscheduled care (Scottish Government Health Delivery Directorate Improvement and Support Team, 2007), while the publication by the Royal College of Physicians of London's (2007) Acute Medicine Task Force *Acute medical care: the right person in the right setting – first time* outlines current best practice for acute medicine. Both documents build on previous reports published over the last decade (Royal College of Physicians of Edinburgh and Royal College of Physicians and Surgeons of Glasgow, 1998; Federation of Medical Royal Colleges, 2000; Royal College of Physicians of London, 2002a,b, 2004) and form the basis for this discussion article, which will divide standards for acute medicine into two domains – first those that relate directly to quality of care, and second the organization and process for acute medical units, including acute medical take. Key performance indicators will also be discussed. Training is discussed elsewhere within this supplement.

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Quality of care

Previous publications and reports have raised concerns over the delivery of care for patients with medical problems and have highlighted factors that relate to poorer outcomes, including:

- Delays in consultant review (National Confidential Enquiry into Patient Outcome and Death, 2007)
- Recording but ignoring abnormal physiological measurements with delay in treatment (McQuillan et al, 1998; National Confidential Enquiry into Patient Outcome and Death, 2007)
- Admissions out of hours and on weekends (Bell and Redelmeier, 2001; Seward et al, 2003).

The National Confidential Enquiry into Perioperative Death (2002) highlighted the importance of senior involvement for surgical patients and the need for adequate high-dependency facilities, resulting in changes to the current management of surgical emergencies throughout the UK. Driven by earlier reports, changes in the pattern of acute medical care have taken place with emerging evidence of improving outcomes.

Several articles have shown better outcomes for patients admitted through an organized acute medical care process. In particular, two demonstrate significant trends towards improvement following the introduction of a structured acute medical system with better mortality (Moore et al, 2006; Rooney et al, 2008), and a further article shows shorter hospital length of stay (Moloney et al, 2005). In contrast to data from larger studies (Bell and Redelmeier, 2001), a smaller study from Edinburgh found no difference in mortality between weekend and weekday admissions for patients with common medical problems (Schmulewitz et al, 2005). While these studies did not examine the reasons for success in detail, all describe a consistent approach to the delivery of acute care, with clear leadership for acute medicine. The Edinburgh study also described consistent staffing levels, including medical, nursing, pharmacy and allied health professionals, over the entire week and with diagnostic support at weekends.

Early warning scoring (EWS) systems are now part of routine practice throughout the UK. Documents from National Institute for Health and Clinical Excellence (2007) and the National Patient Safety Agency (2007) have emphasized the need for such systems and outlined the core elements to be used within a scoring system. At

Table 1. Core elements of an early warning score

Pulse
Blood pressure
Respiratory rate
Temperature
Oxygen saturations
Conscious level score

From National Institute for Health and Clinical Excellence (2007)

present, there is no single standard system, but the agreed core elements are shown in *Table 1*. Importantly, many scoring systems are initiated when a patient is felt to have become sick(er), but it has been shown that mortality, critical care utilization and length of stay are all related to EWS at the point of entry to care (Kellett and Deane, 2006; Paterson et al, 2006; Rooney et al, 2008). It should be noted that although the three studies used slightly different EWS, all used core physiological measurements and two used additional assessments which included age and either assessment of chronic health (Rooney et al, 2008) or functional status (Kellett and Deane, 2006).

In addition to establishing a baseline score at the point of entry to care, there is a need for ongoing monitoring of physiological parameters, which should preferably be incorporated into the routine temperature charts for ease of use (Paterson et al, 2006). These publications support the concept that EWS is a vital component of acute medical care that should be initiated at the point of admission and continued throughout the patient stay. The introduction of an EWS system must, however, be supported by an education programme to ensure success with defined local response systems in place (Paterson et al, 2006; Federation of Royal Colleges of Physicians, 2007; National Institute for Health and Clinical Excellence, 2007) (*Table 2*).

Organization and process of acute medical care

There are no current NHS standards for the policies, staffing or design of acute medical units. This is anomalous since standards exist for inpatient wards and for specialist areas such as intensive care. The Acute Medicine Task Force report (Royal College of Physicians of London, 2007) and earlier work from the Society for Acute Medicine (2003) have suggested standards and recommendations for acute medical unit facilities and staffing structures. The Acute Medicine Task Force report also discusses the essential role of other specialties in contributing to and supporting the acute medical take that needs to be defined at a local level. Equally, acute physicians and other specialty physicians will need to continue to work together to deliver the acute take if improved senior cover is to be delivered each day.

Patients admitted as medical emergencies routinely constitute the largest proportion of patients occupying inpatient medical beds and present with a spectrum of problems. The majority of patients seen in an acute medical unit are admitted via the emergency department, although the trend is to support more direct admissions from primary care. This is particularly the case for larger hospitals and reduces unnecessary steps in the patient journey. Co-location of the acute medical unit and emergency department reduces patient and staff transfer

Table 2. Potential recommendations relating to the quality of acute care

Patients should be assessed by a competent decision-maker within 30 minutes of in-hospital referral to an acute medical team from the emergency department, or on arrival at an acute medical unit if directly referred (Scottish Government Health Delivery Directorate Improvement and Support Team, 2007)
A treatment and investigation plan should be formulated and instigated within 60 minutes of arrival (Scottish Government Health Delivery Directorate Improvement and Support Team, 2007)
Patients to be seen and management plan reviewed within 12 hours (but preferably sooner) by the admitting consultant physician (National Confidential Enquiry into Patient Outcome and Death, 2007; Royal College of Physicians of London, 2004, 2007)
Patients to have an early warning scoring (EWS) system recorded at point of entry to care (National Institute for Health and Clinical Excellence, 2007; Royal College of Physicians of London, 2007)
Patients to have regular EWS score undertaken, preferably as part of their routine, physiological recording (temperature, pulse and respiratory chart), with locally defined response systems (National Institute for Health and Clinical Excellence, 2007; Royal College of Physicians of London, 2007)
Single sex accommodation to be provided except within monitored areas (Royal College of Physicians of London, 2007)
Regular monitoring of key performance indicators in acute care (Royal College of Physicians of London, 2007)
The initial assessment, investigation and treatment of all patients presenting in an unscheduled manner should be consistent with the '4-hour target' regardless of the place of treatment (emergency department, acute medical unit or joint early care unit) (Scottish Executive, 2004)
NHS boards have policies and guidance in place to ensure the timely undertaking of investigations appropriate to unscheduled care patients (Royal College of Physicians of London, 2004, 2007)

time, facilitates continuity of care and allows for the sharing of diagnostic facilities. This should improve patient flow and decision-making as well as optimizing the use of resources, and should be considered an integral part of the planning of all new unscheduled care facilities, including the opening of an acute medical unit in an existing hospital structure.

In considering the organization and design of acute medical units it is also essential to consider the range of case mix and illness severity of patients. Virtually all acute medical units will need to be able to deal with both acutely unwell patients requiring immediate treatment and those with complex psychosocial needs. For the acutely unwell patient, the acute medical unit must have staff and facilities to provide level 1 critical care and larger units may incorporate level 2 facilities (Intensive Care Society, 2002; Royal College of Physicians of London, 2007). Delivering this level of care promptly and to high standards requires a multi-professional approach initiated at the point of entry.

For complex needs patients, who are usually older and represent an increasingly large component of acute medical admissions (Kendrick, 1996; Royal College of Physicians of London, 2000), a multi-professional team approach is also essential. In addition to the medical components of their illness, these patients will often require functional assessment and a full medication review, preferably undertaken as soon as possible after admission. It is particularly important that acute medicine works closely with primary care and community-based services to support a reduction in the number of elderly patients with more than two admissions per year. This group is contributing to the increased number of admissions seen in the elderly, and a more proactive approach should improve outcomes for these individuals. Evidence of close working relationships and common standards for community care would seem likely to be beneficial but fall outwith the remit of this article.

The core medical and acute medicine curricula are designed around a competency-based framework to reflect common medical presentations for doctors in training (Federation of Royal Colleges of Physicians, 2007). Building on earlier publications, medical staff should also have protected time for the delivery of acute medical care, and should work as part of a dedicated acute medical team (Royal College of Physicians of London, 2007).

As yet there is no established national curriculum for nursing skills, and this must be progressed to support career development in acute care. It is also important to recognize that staffing levels to accommodate the workload and range of medical care are significantly greater than standard medical wards. The Society for Acute Medicine (2004a) has published a document on the nursing staffing levels within the acute medical unit, which is currently being updated.

Functional assessments, with the aim of maintaining the independence of complex needs patients, are important to safely facilitate discharge and avoid unnecessarily long admissions. Allied health professional involvement, particularly physiotherapy and occupational therapy but also speech and language therapy and dietetics, is therefore needed. Optimally, there should be physiotherapy and occupational therapy input 7 days a week, which should be part of the dedicated acute medical unit team (Society for Acute Medicine, 2004b). The provision of dedicated facilities to support and expedite therapy assessment within or adjacent to the acute medical unit is justified because of the volume of patients assessed and fully supports discharge planning at the time of admission, which is now recommended as part of good clinical practice (NHS Modernisation Agency, 2004), as are proactive discharge teams (Moss et al, 2002).

Similarly, medication-related problems are a recognized cause of patient harm. Approximately 2.5 million medications are prescribed every day in the UK (Department of Health, 2004). Although most are used safely, medication-related problems (defined as any consequence of a medication that is 'potentially harmful to the patient's health or which may prevent the patient from achieving the full therapeutic effect of the drug used' (Schaefer, 2002)) are a leading cause of morbidity and mortality. It is estimated that medication-related problems account for at least 6.5% of all UK acute hospital admissions and over 5000 deaths per year (Pirmohamed et al, 2004).

Transitions between interfaces of care, especially discharge from acute hospital care into the community, are widely recognized as high-risk settings for the development of medication-related problems (Kripalani et al, 2007). 'Medication continuity errors' are extremely frequent: they involve up to 70% of patients (Department of Health, 2008) and have a major impact on rates of hospital readmission (Moore et al, 2003; Van Walraven et al, 2004). A recent Nottingham study found that 40% of hospital readmissions within 28 days of discharge were related to such errors (Witherington et al, 2008). Given that this is a recognized area of clinical risk, and that acute medical units treat and discharge large number of patients, pharmacist involvement on a daily basis would appear to be an essential part of the acute medical unit team.

A further area which should be explored is the management of mental health needs in the acute setting; this has been summarized in a recent report (Academy of Medical Royal Colleges, 2008).

Acute medical units depend on all staff members working as part of an integrated, multi-professional team, and this requires clear policies and ongoing staff education and training. Each unit should have relevant policies and guidelines in place as well as facilities for such education and training (*Table 3*).

Table 3. Potential recommendations relating to the organization and process for acute medical units including staffing

Acute medical units should have a written operational policy available on the unit and on the hospital intranet. This should include agreed support form other specialties
Acute medical units should have a nominated lead consultant and nursing lead
Acute medical units should have medical staff dedicated to the acute medical take with protected time for acute medical take
Acute medical units should have monitoring facilities that conform to at least the standard of level 1 critical care
Acute medical units should, where possible, be co-located with emergency departments
Acute medical units should have easy access to laboratory investigations
Acute medical units should be in close proximity to diagnostic imaging with easy access to imaging investigations
Acute medical units should have teaching accommodation within each unit.
Larger acute medical units should incorporate an activities of daily living suite within or adjacent to the unit

From Royal College of Physicians of London (2004, 2007)

Clinical performance indicators

There are no agreed performance indicators for acute medical units, and the authors propose that these be developed. Acute medical units should support the delivery of current disease-specific standards as well as generic standards, including the 4-hour emergency access target(s). In addition, the authors suggest that acute medical unit-specific performance indicators are developed to reflect their function and patient needs.

Previous publications have demonstrated higher mortality for patients admitted out of hours and at weekends (Bell and Redelmeier, 2001) and the National Confidential Enquiry into Patient Outcome and Death (2007) report recognized that at least 40% of patients at risk are admitted acutely. Mortality should therefore be an integral performance indicator.

Patients with multiple readmissions contribute to hospital bed overuse (Kendrick, 1996). Acute medical units must have the ability to recognize patients who require inpatient hospital admission as well as to manage and treat patients who can be discharged. Therefore monitoring trends in admission rates, direct discharge rates and readmission rates to ensure the provision of optimal care would seem sensible. Evidence of close working relationships, medicine of the elderly and primary and social care with agreed pathways of care should be seen as good practice.

To support improvement of the delivery of care, acute medical unit consideration should be given to regularly audit 'tracker' medical conditions to assess care and patient flow within acute medical care. Given the high incidence of medication-related problems, this should include medication audit. Capturing patient experience, to support further improvement in the quality of care, should also be included (*Table 4*).

Conclusions

Given the rising number of patients admitted with medical problems and the expanding number of acute medical units, we must now develop standards for clinicians and NHS managers which allow outcomes to be compared. More importantly, this will drive continuous improvement in patient care within acute medicine. Adopting standards and performance indicators will also establish a common 'language' within the NHS to improve communication and understanding within and between organizations.

Conflict of interest: none.

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Table 4. Suggested performance indicators

Mortality rates	Within 48 hours of admission
	Hospital mortality rates
	Weekend *vs* midweek mortality rates
Direct discharge rates monitored within 24 or 48 hours of admission	
Readmission rates monitored within 7 days of discharge	
Intermittent audit of tracker conditions including medication management	
Patient experience	

From Royal College of Physicians of London (2007)

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Thursday 13 November 2008

What is acute medicine and do we need it?

What is acute medicine?

Professor Bryan Williams, Professor of Medicine, Leicester Royal Infirmary and University of Leicester

The Acute Medicine Task Force of the Royal College of Physicians of London (2007) defined acute medicine as 'that part of general (internal) medicine concerned with the immediate and early specialist management of adult patients with a wide range of medical conditions who present to, or from within, hospitals as urgencies or emergencies'. This specialist discipline has developed out of necessity. There have been a number of levers for change, including increased numbers of patients presenting to hospitals with multi-system and complex acute illness; the change in availability of doctors to supervise acute medical care in hospitals as a consequence of the European legislation on working time; and the introduction of the 4-hour emergency access target in emergency departments. The latter, in particular, has meant that acutely ill patients are admitted rapidly to acute hospitals. This has required the reorganization of acute medical services and clinical decision makers with the competencies to deliver care 24 hours per day, 7 days per week.

In addition, there has been a long overdue national focus on the quality of acute medical care and patients' safety by policymakers. This has led to the development of acute medical units that are designed to deliver acute medical care, usually in the first 48 hours of an acute medical illness and for longer if necessary. By necessity, these units have had to develop facilities for higher dependency care with staff who have the necessary competencies to deliver it. Many acute medical units have also developed 'short-stay units' that allow patients to complete their acute care before discharge, without the need to transfer into the main bed base of the hospital, improving the safety and efficiency of acute medical care. Moreover, acute medical units have become the hub for acute medical care in many acute hospitals, providing a focus for coordinated outreach care to patients who develop acute medical illness when in hospital.

These developments have required the establishment of a cadre of specialist physicians who are trained in the competencies of level 3 acute medical care in dedicated programmes. These acute physicians will also provide leadership in the acute medical units, but their work must be complemented by other specialist clinicians continuing to commit time in their job plans to acute medicine. This is essential to allow these specialist clinicians to retain their own competencies in acute care and to provide multidisciplinary specialist medical input for the acute medical units when required. The development of acute medicine as a discrete discipline has been long overdue and is essential for the regular review of senior clinical decision making to ensure the most efficient care of acutely ill patients during their most vulnerable period.

Conflict of interest: none.

Royal College of Physicians of London (2007) *Acute medical care: the right person, in the right setting – first time.* Report of the Acute Medicine Task Force. Royal College of Physicians of London, London

Primary care

Dr Ken Lawton, Chair, Royal College of General Practitioners Scotland

With the recent changes in the General Medical Services contract, GPs were able to opt out from contractual obligation to provide out-of-hours medical care. This has greatly reduced the exposure to acute unscheduled medical care that GPs have. That is not to say that GPs have no exposure to acute medical care, but that it is restricted to the hours that their surgeries are currently open. This has major implications for the training of future GPs and for ensuring that current GPs remain up to date and do not suffer from an attrition of acute medical skills.

As a result of these contractual changes, specialisms are developing within general practice and primary care, and a significant number of practitioners are working wholly or part-time in out-of-hours services or other environments where acute and unscheduled care form a large proportion of the workload.

A definition of acute care in primary care is required so that general practice and organizations that make up general practice and primary care can respond appropriately.

The presentation explores current models for the provision of acute care in general practice and looks at the changing nature of acute care in general practice. It also looks at possible future models working in an integrated way with secondary care and at the way that services may be delivered safely, effectively and efficiently.

Conflict of interest: none.

Accident and emergency

Dr Julian Redhead, Consultant in Emergency Medicine, St Mary's Hospital, London

Emergency medicine and acute medicine specialists have many skills in common. There is a common core training pathway, and some physicians are opting to combine a future career in both emergency medicine and acute medicine. However, there are also differences in the skills and training required for working in each area, and the benefits for the patient lie in the close collaboration between the two specialties and departments.

The changes in the pathway for admission of the medical patient have resulted in the development of the admissions ward, and this has produced noticeable benefits to patients and staff involved in their care. However, evidence from the history of emergency medicine has demonstrated the need for strong clinical leadership of these wards, and the specialty of acute medicine needs to ensure that this is recognized.

This leadership should come from consultants whose job plan reflects the need for a predominant amount of time spent within the acute admissions area. How much regular commitment to acute medicine they should provide – and which skills are required to allow consultants to define themselves as acute physicians – needs to be decided so that there is consistency in care across hospitals. The role of acute physician with a specialty interest will allow consultants to have additional skills, and admissions units with a number of acute physicians with different special interests will allow patients to have rapid access to these skills during the working week, regardless of which specialty is 'on call'. Evidence needs to back up the intuitive thoughts that this will lead to shorter length of stays through earlier management plans and possible admission avoidance.

Collaboration between emergency medicine and acute medicine will allow a smooth transition for the patient between the different specialties and will include a single clerking document, joint guidance for the care of medical conditions and earlier senior involvement in the care of seriously unwell medical patients.

Conflict of interest: none.

Interface with specialty

Dr Veronica White, Consultant Acute Physician, Barts and the London NHS Trust

'The right person in the right setting – first time' is one of the principles of acute medicine and refers to the importance of acutely unwell medical patients being seen in a safe, appropriate environment by staff who have been trained to recognize and assess such problems (Royal College of Physicians of London, 2007). But what happens to patients once they have been assessed at the front door and if they need admission for a specialist medical problem? The traditional model of general medical firms was that patients stayed under the admitting consultant regardless of their complaint. However, over the past two decades, with the development of more effective but often more complex care pathways and the introduction of specialist interventions such as primary angioplasty, the ongoing care of medical patients has been shown to be more effective and efficient under specialist teams (Moore et al, 2006). Mortality, particularly in younger patients, length of stay and readmission rates have all been shown to be reduced when patients receive specialist care.

Hospital trusts have often tailored such care according to their size and resources. Many teams will be ward-based, and in larger institutions it may be possible to have daily specialist ward rounds. Triage systems exist that ensure that while patients' initial care may be from an acute medicine team, their ongoing care is specialty-based. Such methods can both challenge and stretch the traditional model and may mean redirecting resources into areas such as cardiology, respiratory medicine or care of the elderly, where large numbers of patients often present. This presentation discusses these issues and looks at some of the problems that can occur when adapting existing systems, as well as the positive side of specialty triage.

Conflict of interest: none.

Moore S, Gemmell I, Almond S et al (2006) Impact of specialist care on clinical outcomes for medical emergencies. *Clin Med* **6**(3): 286–93

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What is the optimal configuration for multi-professional working in the acute medical unit?

What is essential?
The optimal configurations?

Dr Solomon Almond, Consultant Physician, Royal Liverpool University Hospital

The infrastructure and layout of an acute medical facility are important in shaping the services offered and providing a framework for the processes of the unit. Staffing patterns is the other major determinant of acute medicine units' configuration.

Lessons can be learned from other health systems in their approach to the management of medical emergencies and from differing systems in the UK. Particular current issues include whether a unit should be multidisciplinary, and differing models of step-down care. The role of clinical decision units, specialist facilities embedded in acute medicine units, and the interface with emergency medicine are also relevant.

The Royal College of Physicians of London has considered acute medicine unit configuration, and many of the principles adopted in its 2007 report will be discussed.

Differing models suit differing systems and goals of the service. The placement of acute medicine units within the hospital footprint is crucial as are the key interfaces with critical care, emergency medicine, radiology and cardiological specialist services. Models of care that provide for early senior medical review are optimal.

Managing patients' clinical needs in an innovative way at the extremes of secondary care is important. The exclusion of significant pathology in well patients can be done in an outpatient setting and process, whereas the critically ill should be managed in a high-dependency facility within acute medicine units, ideally in conjunction with critical care colleagues.

Robust staffing at all levels should be mapped to patient flows; typically, staffing has to be strongest in the afternoon and early evening. Extended hours and weekend working for consultants is important. The European Working Time Directive 2009 will impose further constraints on medical staffing, and methodologies to cope with this will be discussed.

Conflict of interest: none.

What do you need to sustain it?

Dr Elizabeth Myers, Nurse Consultant – Acute Medicine, NHS Tayside

Regardless of the design or staffing of an acute medicine unit, effective multi-professional team-working is essential to achieve adequate patient flow and quality patient care (Royal College of Physicians of London, 2004). Strong clinical leadership is necessary to sustain this. Acute medicine has evolved as a specialty for medicine, but as yet this has not been the case for nurses. The specialist knowledge and skills required by nurses in the acute medicine unit are broad because of the range of conditions experienced, and the dynamic and challenging environment.

The roles of other professionals are equally important. There is significant evidence to support the role of the specialist clinical pharmacist in preventing medication errors by timely medicines reconciliation (Audit Commission, 2001; Scottish Executive, 2002). The rising numbers of older people admitted as medical emergencies necessitate the appointment of physiotherapists and occupational therapists dedicated to the acute medicine unit (Ellis and Langhorn, 2005). Other specialist liaison services needed to provide support to acute medicine unit staff and patients include learning disability, dementia and alcohol liaison.

Effective patient flow through the acute medicine unit is essential to achieve safe and timely care. There are many factors that contribute to this, and adequate ancillary support from porters, domestic and clerical staff is needed to ensure other members of the multi-professional team are able to focus on their own roles. Good communication with other departments is essential. Finally, proactive discharge planning throughout the medical wards is key to managing capacity and flow effectively (Department of Health, 2003, 2004).

Conflict of interest: Dr Myers has shares in AstraZeneca and GlaxoSmithKline.

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How do we deliver this service south of the border?

Ms Heather Lawrence, Chief Executive, Chelsea and Westminster Hospital NHS Foundation Trust, London

There is no one model for the delivery of acute medical care south of the border. The Acute Medical Task Force report produced general guidelines to support the future development of acute medicine and acute medicine units. Key to the changes is delivering safe and effective patient care while improving patient experience. This presentation focuses on the experience in one acute teaching hospital – Chelsea and Westminster, where an acute medicine unit was set up in August 2007 – but will also recognize developments in other units. The aim is well coordinated patient care is, leading to early diagnosis, prompt treatment and timely discharge from hospital. Central to achieving this aim is the effective multi-professional and interdisciplinary working of our staff. Experience demonstrates that a core multidisciplinary team co-located and working to shared protocols of care with streamlined assessment leads to managing patient care effectively and shortening the length of stay. This presentation explores how the leadership of such teams is necessary both within a collective team and within the separate professions.

Some of the key challenges come from the conflicting demands of the individual professional groups and specialties, and this highlights the need for excellent communication and dedicated time to develop shared protocols of care that each professional group can buy into. The presentation covers the importance of a well-communicated corporate plan with clear objectives, which are then replicated within each service.

The development of acute medicine units is still evolving. Patient safety initiatives, remote monitoring and challenges to the preconceived expectations of the role of each of the professional groups will be explored.

Conflict of interest: none.

Further reading

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How do we deliver this service north of the border?

Dr Roelf Dijkhuizen, Medical Director, NHS Grampian

With the divergence of health systems in the UK post devolution, marked differences have developed in the organization, if not delivery, of health care between England and Scotland. Whereas the English system has developed along the drivers of competition, diversity and a mixed economy, the Scottish system has developed more along the lines of traditional public sector services. Whereas England works with strategic health authorities, foundation hospitals and primary and secondary care trusts, NHS Scotland is organized as a 'single system'. Community health partnerships between the NHS and local authorities have been put in place and organizational boundaries between primary and secondary care have been removed. The national policy document *Better Health, Better Care* (Scottish Government, 2007) aims to move from hospital-centred service provision to service provision embedded in communities, and emphasizes integrated care organized around patient clinical pathways across the community and hospital sectors.

In this context, emergency medicine is required to integrate the roles of community response services with general practice out-of-hours services, accident and emergency services, and medical and surgical admission services. This requirement for integration brings challenges relating to the professional role and identity of clinicians working in these services. Using the emergency care services in NHS Grampian as an example, these services are discussed in the context of Modernising Medical Careers and medical workforce planning.

Conflict of interest: none.

Scottish Government (2007) *Better Health, Better Care: Action Plan.* Scottish Government, Edinburgh (www.scotland.gov.uk/Resource/Doc/206458/0054871.pdf accessed 11 December 2008)

Ambulatory care: what is it and do we need it?

What is it?

Dr Ian Sturgess, Associate Medical Director, East Kent Hospitals University NHS Trust

Ambulatory emergency care as a concept is already well established with the management of deep vein thrombosis, but has the potential for considerable expansion. The challenge is to design safe, innovative and effective approaches to manage acute illness by developing appropriate risk-assessment tools and innovative monitoring systems to optimize patient outcomes and minimise the length of hospital stay.

An analogy to the development of ambulatory emergency care is the introduction of day case surgery for elective care over the past 50 years. There are clearly differences, however, between day-case admission for definitive surgical therapy in a generally ambulatory, 'well' patient cohort and the often non-specific presentations of many (elderly) medical patients who require a thorough history and examination before due consideration of appropriate investigations.

The Royal College of Physicians of London (2007) Acute Medicine Task Force produced a working definition:

'Ambulatory care is clinical care which may include diagnosis, observation, treatment, and rehabilitation, not provided within the traditional hospital bed base or within the traditional outpatient services that can be provided across the primary/secondary care interface.

'In the context of acute medicine, it is care of a condition that is perceived either by the patient or by the referring practitioner as urgent, and that requires prompt clinical assessment, undertaken by a competent clinical decision-maker. The healthcare setting may vary, but for optimal clinical care will often require prompt access to diagnostic support.'

Ambulatory care must be high-quality care, designed to ensure the best outcomes for patients. It is the responsibility of those delivering the care to ensure that resources are deployed in the most cost-effective manner. In essence, the development of ambulatory emergency care could be seen as one means of defining the specialty of acute medicine from emergency medicine, general internal medicine and specialty medicine, although there will, of course, be overlaps.

Conflict of interest: none.

Royal College of Physicians of London (2007) *Acute medical care: the right person, in the right setting – first time.* Report of the Acute Medicine Task Force. Royal College of Physicians of London, London

Further reading

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Primary care perspective

Dr Andrew Cowie, GP, Tayside

The need for a separate 'primary care view' underlines the problems with trying to organize a whole-system service for patients, and raises concerns that individual parts of

the NHS will make plans for their own area without regard for the impact on other services.

This presentation outlines the different approaches taken in primary care to deal with patients' clinical needs and demands, starting with general practice. Practices deal with the lion's share of clinical patient contacts in the community, with an average of 5.3 contacts per patient per year. This represents a rise of more than 33% over ten years, and the presentation discusses some of the measures used by practices to address this, including appointment systems and skill mix. Many other innovative ideas, including electronic communication with patients and improved services to nursing homes, are being piloted in Tayside.

Community nursing services are also working in new ways to try to address the increasing number of elderly, housebound patients with multiple pathologies. Care management has not shown the same degree of change in admissions as seen in the USA, but may still have a role in supporting the most complex patients.

Pharmacies have huge numbers of contacts with patients, and their new contract has an emphasis on more active medicines management and minor illness care on demand to registered patients.

Out-of-hours services unfortunately show some variance in quality since responsibility was passed to primary care organizations. This is complicated by the difficulties seen with the triage provided by NHS Direct and its Scottish equivalent, NHS24.

Walk-in centres remain controversial, and good evidence for their ability to take some of the pressure off accident and emergency departments and general practice is not available.

Overall, it is important that plans for ambulatory care are designed to make patient care more clinically efficient and acceptable to patients, and not simply to transfer work to relieve individual budgets under pressure.

Conflict of interest: none.

Risk assessment of complex needs patients

Iain Duguid, Clinical Specialist Physiotherapist, Royal Infirmary of Edinburgh

Elderly patients with complex needs who present with an acute illness to the 'front door' of the hospital (accident and emergency or a medical assessment unit) are often considered to be prime candidates for a decision to admit to a medicine for the elderly ward. This simple step may often be taken as it seems easier to quickly assess that a patient is elderly, frail, unwell and 'off their legs' and hence requires admission, rather than to institute a focused, multi-factorial, multidisciplinary risk assessment tailored to the individual patient's needs and consider the potential for discharge home. Pressures on time, beds and budgets may suggest that speeding people from an admission area to an inpatient bed is the safest course of action. However, any decision to admit a patient in the case group considered among the most difficult to discharge subsequently may be costly in many ways when an alternative pathway exists.

Guidance on how to achieve timely discharge for straightforward hospital presentations is available (Department of Health, 2004), but little research has been done or guidance produced to identify how to facilitate rapid discharge for elderly patients with complex needs from an accident and emergency or medical assessment unit (Hardy et al, 2001; Duguid, 2003). The composition and skills of an empowered multidisciplinary team are critical to the successful discharge of this patient group, as are the practical components of assessment, and these areas are considered in detail in this presentation. Of prime importance is the experience that it is possible to achieve safe discharge in the complex needs elderly patient group from the front door of the hospital, and that rapid readmission does not need to result from this process (Patterson and Williams, 2005).

The presentation draws from extensive experience as a specialist physiotherapist working within a team in a large acute hospital's medical assessment unit, together with networking from health-care professionals elsewhere in the NHS.

Conflict of interest: none.

Department of Health (2004) *Achieving timely simple discharge from hospital: a toolkit for the multidisciplinary team.* Department of Health, London

Duguid I (2003) *Guidelines for physiotherapy in medical assessment units.* Society for Acute Medicine, Edinburgh

Hardy C, Whitwell D, Sarsfield B, Maimaris C (2001) Admission avoidance and early discharge of acute hospital admissions: an accident and emergency-based scheme. *Emerg Med J* **18**: 435–40

Patterson S, Williams M (2005) An occupational therapy consultation provided to older adults presenting to accident and emergency improves ADL functioning and reduces falls and hospital stays. OTCATS (Occupational Therapy Critically Appraised Topics); Sydney (http://www.otcats.com/topics/CAT-OT&ADLTownsville12Jan2006.pdf accessed 19 November 2008)

Development of ambulatory pathways to avoid hospital admission

Liz Lees, Consultant Nurse, Acute Medicine, Heart of England NHS Foundation Trust

Developing ambulatory care pathways to avoid hospital admissions is often notoriously complex and involves multi-organizational, multiagency and trans-professional working. This is compounded by a lack of consensus on terminology describing the pathways, emergent new multi-professional roles and often unclear service outcomes (Roe et al, 2003). Despite this, health and social care policy remains committed to the continual evolution of new pathways and service development to avoid hospital admissions (Department of Health, 2008). Moreover, for the clinicians involved, together with service commissioners, ambulatory pathways create collaborative innovation opportunities.

This presentation critiques and debates three key principles that should be used to underpin ambulatory care pathway developments to avoid hospital admission (Department of Health, 2005) and gives an overview of an ambulatory pathway in operation in an acute NHS teaching trust (Lees and Sonkor, 2006; Lees et al, 2006):

1. Deciding the infrastructure required
2. Determining the model(s) and the specific service criteria
3. Providing clarity regarding the expected service outcomes.

Deciding the infrastructure required

Infrastructure for ambulatory pathways is a broad concept. The presentation concentrates upon workforce development, which from experience is the greatest area of challenge (Department of Health, 2006). The pace of change in primary and social care is unprecedented, and requires restructuring established teams to integrate new ways of working, developing clinical skills and competencies, simultaneously creating leadership roles (community matrons).

Determining the model and the specific service criteria

Hospitals providing acute services are an essential part of a pathway to avoid hospital admission. This is often misunderstood, with the assumption being that avoidance should be interpreted as 'complete' avoidance. Not so. Developing shared care models (eclectic provision) poses the greatest challenge, yet possibly the greatest rewards, for patients and service providers.

Providing clarity regarding pathway and service outcomes

Clinical outcomes and capacity (places of care) are not always explicit from ambulatory pathways spanning several organizations and multiple professional contacts. The complexity of the pathway will determine how reliably the outcomes are measured (Department of Health, 2004). For example, pathways count 'referrals', 'referrals passed on' from other pathways and 'interventions'. For hospitals keen to maximize admission avoidance options, these issues are frustrating.

Conflict of interest: none.

Department of Health (2004) *The configuring hospitals evidence file: part two.* Department of Health, London

Department of Health (2005) *Supporting people with long term conditions: an NHS and social care model to support local innovation and integration.* Department of Health, London

Department of Health (2006) *Our health, our care, our say: a new direction for community services.* Department of Health, London

Department of Health (2008) *Delivering care closer to home: meeting the challenge.* Department of Health, London

Lees L, Sonkor M (2006) Delivering a new intravenous therapy service. *Emerg Nurse* **14**(3): 30–5

Lees L, Dyer P, Knight J (2006) Developing a new intravenous therapy service: part 2. *Emerg Nurse* **14**(5): 28–34

Roe B, Daly S, Shenton G, Lochhead Y (2003) Development and evaluation of intermediate care. *J Clin Nurs* **12**(3): 341–50

How is multi-professional training optimized in the acute environment?

Tension between training and service delivery

Ms Helen Mackinnon, Director of Nursing & Midwifery, NHS Education for Scotland

There is a symbiosis between delivering a high-quality service, and training and developing the multi-professional team to provide that service. Delivering the service to the patient must take priority in the immediate caregiving situation, but tension arises if dedicated time and investment for staff development is de-prioritized over the medium and longer terms.

This presentation explores strategic avenues to reducing this tension, including:

- The deployment of governance approaches (clinical, educational and regulatory) in order to influence service providers putting in place the right practice education environments for their staff
- The strengthening of workforce planning intelligence, linked to service redesign, so that policymakers and educationalists can respond with appropriate research, pilots and toolkits to support new and developing roles
- The establishment and maximization of partnerships between policymakers, NHS employers, universities and further education colleges. Collaborative investment, aligned to clear strategic vision and outcomes for improving care, can improve the practice learning environment as well as the learning experience of staff
- Gearing up the clinical environment to ensure the full support and recognition of work-based learning by taking advantage of contemporary, effective and flexible learning methods and approaches. The Scottish Credit and Qualifications Framework is one of the tools that can facilitate recognition of work-based learning in Scotland
- The equipping of team members with the appropriate knowledge, skill and access to resources to help them translate research and evidence into practice
- The use of change management and quality improvement methodologies to contribute to a safe service delivered by well-prepared staff.

Conflict of interest: none.

What core skills and core competencies are required?

Dr Phil Dyer, Consultant Physician in Acute Medicine, Birmingham Heartlands Hospital

The acute clinical environment, in the form of the acute medicine unit, should provide numerous opportunities to deliver good multi-professional training. These include:

- An ideal setting to promote the ethos of multi-professional training

- Exposure to a diversity of patients and clinical conditions with a plethora of physical signs
- Access to many of the hospital's investigative and treatment resources
- High levels of performance required from the multi-professional team to achieve optimal patient care.

It should be a multidisciplinary environment and many of the core skills should be interchangeable by various professionals working in the acute medicine unit. The following core skills are required by many of the multi-professional team, albeit at differing levels:

Generic
- Teamwork
- Respecting the disparate members of the health-care team
- Recognizing the skills that each member of the team brings to patient care and management.

Clinical
- Responding to acutely ill medical patients in a timely and effective manner
- Most appropriate placement of acutely ill patients
- Managing patients' needs proactively – constructing a multi-professional management plan
- A structured systematic of assessment
- History-taking and clinical examination skills and the interpretation thereof
- Appreciation of disease presentation and severity of illness
- The requirements for inpatient or ambulatory care
- Venepuncture and the interpretation of blood results
- Arterial puncture and arterial blood gas interpretation
- Obtaining venous access, fluid resuscitation and maintenance fluid
- Electrocardiogram recording and interpretation
- Radiology requesting and interpretation.

Non-clinical
- Understanding the patient journey
- Managing capacity to facilitate the flow of acutely ill patients.

The acute medicine and generic curriculum provides the framework for acquiring these competencies for post-graduate doctors. No such curriculum is available for nurses or other health-care professionals. More work needs to be done on developing core competencies for all health-care professionals involved in the management of acutely ill patients.

Conflict of interest: none.

Who should provide the training?

Professor Philip Cachia, Postgraduate Dean, East of Scotland, NHS Education for Scotland

The 'acute environment' provides rich educational opportunities through the diversity of clinical settings and case mix, the throughput of patients and the established multi-professional team-based approach to delivering patient-focused care.

However, the deceptively simple question about who should provide training cannot be considered in isolation from the wider educational context of mandatory regulatory requirements, different curricula, learning styles, assessment methods and a paucity of agreed standards of practice between professional staff groups.

As a consequence, we have yet to establish, far less optimize, multi-professional training. Achieving this objective will require commitment and innovation from clinicians in the field of acute medicine as well as collaboration with educational providers and researchers to address specific challenges. These include:
- Customizing the educational infrastructure for the 'acute environment'
- Delivering evidence-based inter-professional education
- Developing methods for evaluating 'team performance'.

Substantial progress towards establishing and optimizing multi-professional training will require a multi-dimensional approach involving educational initiatives in the workplace but also in higher education and other settings that can prepare individual practitioners and teams for clinical practice. Components of a coordinated strategy could include:
- E-education
- Scenario-based simulation
- Clinical leadership training
- New role and advanced practitioner training
- Supervised clinical training in the workplace
- Quality improvement.

The scale of the challenge posed in this session should not be underestimated. However, the implementation of the White Paper on modernising professional regulation, the national commitment to 'patient safety' initiatives and the commitment to training and education enshrined in government policy statements, including the Next Stage Review, make it an opportune time to be bold. Acute medicine should take the initiative and develop a strategy to pilot and evaluate a comprehensive approach to multi-professional training and education.

Conflict of interest: none.

Friday 14 November 2008

What are the appropriate standards for acute medicine?

Why do we need standards for acute medicine?

Professor Derek Bell, Imperial College London

Acute medicine has developed rapidly as a specialty and, in common with other relatively 'new' specialties such as critical care and emergency medicine, has developed in

relation to concerns about both the organization and quality of care for patients. Historically, publications have raised concerns about variable outcomes for patients admitted with acute medical problems, which cannot be explained on the basis of disease or patient demographics (Bell and Redelmeir, 2001; Seward et al, 2003; Kostis et al, 2007).

The area that has been addressed most rapidly is the development of new competency-based curricula for acute medicine. However, now more needs to be done to establish standards of care for acute medicine as outlined the Acute Medicine Task Force document. In particular, as acute medicine grows and acute medical units evolve, it is important to understand:

- What an acute medicine unit is and the facilities, staffing and support services necessary to deliver high quality care
- What data should be collected routinely
- What performance characteristics should be expected including patient experience
- The cost benefits.

Recent publications show improved outcomes for patients within an acute medical setting, with reductions in hospital length of stay and no adverse effect on re-admission rates (St Noble et al, 2008). However, more work is needed to understand the key elements that deliver these improved outcomes, such as the staffing structures and the use of illness severity assessment (Paterson et al, 2006; Rooney et al, 2008).

Conflict of interest: none.

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Kostis WJ, Demissie K, Marcella SW et al (2007) Weekend versus weekday admission and mortality from myocardial infarction. *N Engl J Med* **356**: 1099–109

Paterson R, MacLeod DC, Thetford D et al (2006) Prediction of in-hospital mortality and length of stay using an early warning scoring system: clinical audit. *Clin Med* **6**: 281–4

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Seward E, Greig E, Preston S et al (2003) A confidential study of deaths after emergency medical admission: issues relating to quality of care. *Clin Med* **3**: 425–34

St Noble VJ, Davies G, Bell D (2008) Improving continuity of care in an acute medical unit: initial outcomes. *QJM* **101**: 529–33

What are the quality standards?

Dr Michael C Jones, Consultant in Acute Medicine, Edinburgh Royal Infirmary

Defining quality standards in the delivery of care to patients with acute illness has tended to focus on disease-specific conditions. This is apparent in the delivery of care to patients with, for example, acute myocardial infarction or fractured neck of femur. While there is no dispute that these are important standards, there is also a need to define standards for the delivery of care where the diagnosis may not be immediately apparent, or simply to provide prompt, effective and efficient care. This latter parameter is based on the fact that there are very few, if any, acute medical conditions that benefit from delays in diagnosis or treatment.

The Emergency Care Collaborative in England was formed to help individual trusts to modify patient pathways to achieve the quality target of 4 hours to either discharge or admit an individual patient from an acute assessment area of the hospital. The Unscheduled Care Collaborative in Scotland followed this. In this latter project, work was conducted to determine other quality standards that might be defined to demonstrate that care was being delivered appropriately.

The standards defined cover improving patient safety by the early involvement of a senior decision maker, and for each patient to be subject to an illness severity warning system. They also review the delivery of care within the acute medicine unit by setting standards for professional involvement and for the infrastructure of the unit itself. Lastly, and very importantly, there is a need to set standards that relate to clinical performance. Such clinical performance indicators exist in many other areas of medicine but have not been defined for acute medicine. The agreement of definitions to allow comparative data to be shared is an important part of the development of these standards.

Such standards must be relevant to the provision of high-quality, prompt, efficient and effective patient care in the acute setting but also facilitate comparison of effectiveness between disparate acute medicine units.

Conflict of interest: none.

How do we measure them?

Dr Paul Aylin, Clinical Reader in Epidemiology and Public Health, Imperial College London

There is an ever-increasing focus on monitoring clinical standards in many countries' health services, including measures of process (such as administration of prophylactic antibiotics), outcome (such as mortality), and safety (adverse events and patient satisfaction). Data are commonly taken from hospitals' administrative data sets, from other bodies such as national clinical audits, or collected specifically for the measurement of performance indicators. The range, type, construction and use of such indicators vary greatly across countries.

It is important to be clear about the aim of any analysis of performance data. Is it to investigate suspected poor or good performance (of a unit or individual) within a particular pre-selected clinical specialty, typified by the post-hoc analysis commissioned by the Bristol Inquiry (Aylin et al, 2001) or, alternatively, is it to carry out prospective surveillance of health statistics in order to detect areas of concern about clinical performance (Bottle and Aylin, 2008)?

The presentation of performance data is of equal importance. League tables are a common and popular means of presenting data, and are intuitively appealing. However, it is widely accepted that simple rankings are a very imprecise measure of 'true' performance and that comparing institutional performance in this way can be highly misleading. Several researchers have proposed the use of statistical process control charts as an alternative to league tables in monitoring health-care outcomes (Mohammed et al, 2001; Aylin et al, 2003). A variety of statistical process control charts have been suggested, including funnel plots (Spiegelhalter, 2002) and cumulative sum charts (Marshall et al, 2004).

What is apparent is that hospital and clinician performance data is only part of the process of improving the quality of health care. Taken in isolation, they are unlikely to provide an explanation of why a particular unit is an outlier, and should not be used as the sole basis to judge how a unit or clinician is performing.

Conflict of interest: Dr Aylin's department receives a grant from Dr Foster Intelligence (an independent health service research organization).

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Aylin P, Best NG, Bottle A, Marshall C (2003) Following Shipman: a pilot system for monitoring mortality rates in primary care. *Lancet* **362**: 485–91
Bottle A, Aylin P (2008) Intelligent Information: a national system for monitoring clinical performance. *Health Serv Res* **43**: 10–31
Marshall EC, Best NG, Bottle A, Aylin P (2004) Statistical issues in the prospective monitoring of health outcomes at multiple units. *J R Stat Soc Series A* **167**(3): 541–59
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Spiegelhalter D (2002) Funnel plots for institutional comparison. *Qual Saf Health Care* **11**: 390–1

Reflections

How will this change my practice?

Dr Clifford Godley, GP, Strathaven, Lanarkshire

Ever since the Ospedale Santa Maria della Scala opened its doors as Europe's first infirmary in Sienna, physicians have continuously developed new strategies to accommodate, process and treat the daily flow of patients and pilgrims alike.

Even my own career has seen a 180° turnaround in both hospital and community management of acute illness. My 1970s' experience as the junior house officer receiving physician (the most newly qualified and inexperienced member of staff) in Glasgow is correctly to be replaced by the 'Martini' physician (any time, any place, anywhere – the bright one, the right one).

By comparison, my own GP role in the acute admission pathway is significantly reduced. Previously, during a 140-hour on-call week of holiday cover (Godley, 1992), I was involved in 90% of practice hospital admissions. Subsequently, our use of a commercial deputising service at weekends reduced my control of admissions, until finally in 2004 the introduction of NHS24 reduced our involvement to under 50%.

Our local district general hospital has closed completely, although we manage the care of the elderly beds in its replacement, a purpose-built unit where we can informally admit some of our less acute patients for nursing, respite or end-of-life care. As a result of the European Working Time Directive and the Medical Training Application Service, Lanarkshire's remaining three district general hospitals can no longer support all specialties on each site. Although GPs were aware that interventional cardiology was only available at Hairmyres Hospital, ambulance crews directed patients to the nearest district general hospital. An Emergency Response Centre is being piloted, where collaborative working by NHS24 staff grade and associate specialist staff and NHS Lanarkshire Acute Hospitals staff will hopefully improve the patient journey. A single telephone call in weekday working hours will reduce the need to phone around the three hospitals in times of bed shortages, while simultaneously arranging transport. Central coordination promises to improve communications and arrival times and patient delivery to hospital. However, there will be a loss of direct communication with clinical staff and, with this, the loss of informed discussion.

On occasions, a paramedic may be dispatched without the GP's knowledge to ascertain if the patient may be managed at home. This is a laudable aim, but further ignores the GP's role in triaging his/her patients. By comparison in Grampian, where there is a direct surgical admission pathway, GPs are considered to be good gatekeepers for access to emergency surgical care (Mitchell and Keenan, 2008).

The expansion of protocols for the exclusion of common conditions, namely deep vein thrombosis, pulmonary thromboembolism and low-risk chest pain, now includes the management of asthma, transient ischaemic attacks, cellulitis and hypoglycaemia. By definition, these are rule-out services with nurse-led discharge and, given that the aim is for greater than 50% discharge from clinical decision units, provision has to be made for timely follow-up and the management of such patients in primary care. Future proposals may include enhanced primary care diagnostics and, perhaps, a more formal role for our own portable ultrasound.

Lanarkshire intends to pilot the role of experienced GPs in accident and emergency, as well as involving practices participating in enhanced access to become involved in out-of-hours managed care. Who knows, one day I might have 24-hour responsibility for my patients.

Conflict of interest: Dr Godley participated in AstraZeneca's JUPITER study, which ended in 2008.

Godley CC (1992) Partial shifts. *BMJ* **305**: 1297
Mitchell A, Keenan RA (2008) Are Grampian general practitioners good gatekeepers for access to emergency general surgical care? *Scott Med J* **53**(3): 33–5

Training for the future

Dr Hannah Skene, Specialist Registrar in Acute Medicine, Queen's Medical Centre, Nottingham

In 2004 the Postgraduate Medical Education and Training Board (PMETB) recognised acute medicine as a subspecialty of general internal medicine (GIM). We now have nearly 400 trainees in acute medicine higher specialist training, and we will start to see large numbers of acute physicians looking for consultant posts. The training programmes have not been without their teething problems, particularly regarding additional skills training and the length of the Acute Care Common Stem (ACCS) ACCS posts. This is fully discussed in the Society for Acute Medicine's 2007 Training Survey (Skene and Ward, 2008).

The GIM (acute) curriculum, based around three competency levels, was introduced for all trainees entering training after August 2007. Only those with level 3 competencies receive a Certificate of Completion of Training (CCT) in GIM (acute) and become acute physicians. This means that many overseas trainees who have perfectly adequate GIM skills are finding it difficult to get on the UK Specialty Register as they do not fulfil the current level 3 competencies of our GIM (acute) curriculum. Another potential problem is that trainees in other medical specialties will not receive a CCT in GIM (acute). They may therefore not wish to revalidate for something less than a CCT and move away from the 'acute take' which would be bad for patient care and bad for acute medicine.

A potential solution would be to recreate the specialty of GIM, writing a curriculum roughly based around the current level 2 competencies for a CCT in GIM which all acute medical specialty trainees could follow to CCT level. This should help the problems discussed above, but would still leave acute medicine as a subspecialty often seen as inferior against the other medical specialties. If we go a step further with acute medicine and seek full specialty status, this issue could be resolved and would offer us the opportunity to write a new acute medicine curriculum. This new curriculum could then incorporate many of the skills seen as essential to acute physicians but which are as yet not in the current curriculum – leadership skills, management skills and ambulatory care competencies. Additionally, by having both a GIM and an acute medicine curriculum available, we would still differentiate between doctors who take part in the acute take and those competent to run and develop acute medical services.

Acute medicine trainees are currently being asked for their opinion on the above solutions, and initial talks with PMETB and the Society for Acute Medicine (GIM and acute medicine) have been encouraging. The future of acute medicine training remains bright, but we must ensure we choose a future which serves all of our trainees well and ensures the long-term success of acute medicine.

Conflict of interest: none.

Skene H, Ward DK (2008) The Society for Acute Medicine (UK) Acute Medicine Training Survey 2007. *Acute Medicine* **7**(1): 50–4

Paramedic view of pre-hospital care

Mr Stephen Hull, Paramedic, Stonehaven

The community paramedic is a new, developing role within the ambulance service. Various out-of-hours schemes across the UK are using paramedics to work out of primary care emergency centres and minor injury units. Some ambulance services are using community paramedics to treat 999 emergency patients at home.

Further study is carried out at degree level, and when completed the paramedic has access to an extended list of medicines via Patient Group Directions. The paramedics practice semi-autonomously, with support from GPs via telemedicine. Through audit and case study review it has been shown that the performance of these paramedics is similar to a GP in the first year of practice.

It is the opinion of this author that the paramedic role has not been fully utilized, and that with the right training and clinical support can offer a cost-effective, safe service that will help to reduce unnecessary hospital admissions.

Conflict of interest: none.

What does this all mean?

Mr Roy Lilley, Healthcare Author and Broadcaster, Camberley

The NHS has always been in a continuous state of development and change, and, some might say, turmoil. Perhaps this is more true now than it ever was. The 'customerisation' of health care, choice, quality and cost all bring their own pressures. Now there is the added dimension of the impact that the collapse in the banking sector may have, and its impact on the real economy. This presentation looks at the impact on the service, its staff and patients and discusses whether this represents real, lasting change or another management fad that we shall pass through – like so many others.

Conflict of interest: none.

What is acute medicine and do we need it?

The utilisation of a short stay unit as an acute care area: the case for acute medicine specialists

C McQueen, Emergency Department, C Woodward, Acute Medical Unit, A Fox, Short Stay Unit, Kings Mill Hospital, Sherwood Forest NHS Foundation Trust

Aim: In our district general hospital, alongside an 18-bedded acute medical unit, there exists a separate 14-bedded short stay unit for anticipated stays of less than 2 days. There are no specific admission protocols for the short stay unit.

There is no dedicated acute medical team; three different general internal medicine consultants are on call during each 24-hour period. The care of patients admitted to the short stay unit is the responsibility of the on-call consultant.

This study analyses the range of patients identified as suitable for admission to the short stay unit and the efficacy of their management on the unit.

Methodology: A retrospective observational study of admissions to the short stay unit was undertaken during May 2008. The results were analysed using the Excel computer program (Microsoft Corporation).

Outcomes and results: There were 210 acute admissions to the short stay unit during May 2008, the majority of which were admitted from acute medical unit. Eighty per cent of admissions were for a range of ten conditions, chest pain being the most common.

Ninety-five per cent of patients were discharged from the short stay unit within 2 days. Twenty-seven different consultants cared for patients during the study period. Discharge activity from the unit was clustered in afternoon sessions, as in the absence of a dedicated short stay unit team, patient review was dependent upon the availability of consultants or their junior teams.

Conclusions: A dedicated team of doctors with specialist acute medicine training is required, coupled with condition-specific care pathways, to improve streamlining of appropriate patients to the short stay unit and facilitate more rapid assessment/investigations and discharge from the unit.

Conflict of interest: none.

Trends of activity in a large medical admissions unit: a three-year audit

S Moreea, SM Alam SM, SY Khan, AR Brown, Bradford Hospitals Foundation Trust

Aim: A 3-year audit of the workload on the medical admissions unit.

Method: Data were obtained retrospectively from the hospital information services for the years 2005–2007.

Results: see *Table 1*.

Conclusions: These findings show important trends that have bearings on the 4-hour accident and emergency wait time, safety of discharges and service delivery as per the 2007 Royal College of Physicians of London report Acute Medical Care.

Conflict of interest: none.

Table 1. Results of a 3-year audit on the medical admissions unit in Bradford Royal Infirmary

Year		2005	2006	2007
No. of admissions to medical admissions unit		10 045	10 536	10 554
Monthly variation		706–902	819–950	819–942
% males		52%	51.5%	51.4%
Admissions from accident and emergency		7374 (73%)	8038 (76.3%)	8393 (79.5%)
No. of patients discharged home from medical admissions unit		5135 (51.4%)	6041 (57.3%)	6125 (58%)
Length of stay on medical admissions unit	<1 night	2371 (46.2%)	2947 (48.7%)	3053 (49.8%)
	1–2 nights	2416 (47.0%)	2731 (45.2%)	2651 (43.3%)
	2 nights	165 (3.2%)	181 (3.0%)	200 (3.3%)
	>2 nights	183 (3.6%)	182 (3.1%)	221 (3.6%)
% patients aged 16–76 years		99%	99.3%	98.7%
No. of patients admitted to medical wards		4010 (81.7%)	3210 (71.4%)	3012 (68.0%)
No. of patients admitted to non-medical wards		900 (18.3%)	1285 (28.6%)	1865 (32.0%)
Average length of stay		9.5 days	8.7 days	9.7 days
Main diagnoses (healthcare resource groups)		Chest pain 2355 (23.3%)	Airways disease 3361 (31.9%)	Chest pain 2311 (21.9%)
		Airways disease 1855 (18.4%)	Chest pain 2930 (27.8%)	Airways disease 2153 (20.4%)
		Poisoning 1029 (10.2%)	Poisoning 1339 (12.9%)	Poisoning 1170 (11.1%)

Medical skills mix matters

T Gibson, K O'Kane, Department of Acute Medicine, St Thomas' Hospital, London

Summary: The St Thomas' Acute Medicine Model features consultants and juniors in acute medicine working alongside accident and emergency doctors in the accident and emergency department rather than in a separate medical assessment unit. Our data show that acute medicine consultants can work effectively in the accident and emergency department, see an appropriate selection of patients, are a popular facility for accident and emergency doctors and have a significant beneficial effect in avoiding medical admissions.

Method: Prospective audit of 600 consecutive patients seen by two consultants in acute medicine between May and August 2008. Source of referral, diagnosis and disposal of patients were recorded. We also recorded the number of patients where a 'decision to admit' was made by medical staff, but acute medicine consultation subsequently avoided admission.

Results: Of 600 referrals, 302 (50.3%) came from acute medicine junior staff and the bulk of the remainder, 278/600 (c46.3%), from accident and emergency doctors; the rest (3.4%) came from other physicians, accident and emergency GPs and senior nursing staff. The most common presenting complaints and diagnoses were: chest pain (115; 19.2%), of which 30 (26% of all chest pains) were cardiac in origin; syncope and falls (57; 9.5%); asthma/lower respiratory tract infection/chronic obstructive pulmonary disease (56; 9.3%), and abdominal pain (52; 8.6%). Of the 600 patients, 445 (74.2%) were discharged home and 115 (19.2%) admitted. Medical admission was averted in 59 patients (9.8%).

Conclusions: Our data show that 46.3% of referrals to the acute medicine consultants at St Thomas' Hospital come from accident and emergency doctors, suggesting that an acute consultant physician opinion is valued by accident and emergency staff as contributing to improved medical management of the acutely unwell patient. Furthermore, an acute medicine consultation avoided admission in 59/600 patients (9.8%), suggesting that acute medicine consultants working in the accident and emergency department significantly reduce medical admissions.

Conflict of interest: none.

What is the optimal configuration for multi-professional working in the acute medical unit?

Palliative care patients in the emergency medicine unit

J Atkinson, T Peel, N Chamberlin, Wansbeck General Hospital, Ashington; L Barton, E Grogan, North Tyneside General Hospital, North Shields

Aim: To assess the appropriateness of acute admission for palliative care patients in two hospitals within Northumbria. To assess the reason for admission, patients' wishes regarding preferred place of care and their outcome, with reference to current National Institute for Health and Clinical Excellence guidelines regarding palliative patients.

Methods: All patients admitted in January 2008 with a palliative diagnosis were reviewed with a standardized proforma by three auditors.

Results: Forty-seven notes were reviewed. Over 50% of patients self-presented, with only 4% being referred by a GP deputising service. Active treatment was the aim of admission in 55% of patients and symptom control in 28%. Only 23% of patients were identified as palliative before admission. Thirteen patients had identified a preferred place of care and this was fulfilled for ten of them. The Liverpool Care of the Dying Pathway was used for half of those who died in hospital.

Conclusions: The majority of patients were admitted for active treatment, an appropriate use of acute care. If previously identified, patients requiring symptom control or end of life care may have been able to receive this in the community. Few patients were asked about their preferred place of care, however; when they were this was usually fulfilled. The Liverpool Care of the Dying Pathway is underused in terminally ill patients. Trust-wide action has been taken and admissions will be reaudited in September.

Conflict of interest: none.

Acute medical wards: adequacy of senior medical care, patient referral systems and subspecialties input.

TA Warlow, TAM Abdu, Plymouth

Aim: To audit the functioning of Walsall Manor Hospital's integrated assessment unit, focusing on medical subspecialties' input into acute care. Areas assessed were:

- Time from admission to senior physician review – within 24 hours recommended
- Time from referral to review by the appropriate speciality – within 24 hours recommended
- Effect on patient care and discharge rate.

Methodology: Seventy-two subjects were randomly selected from patients referred from the integrated assessment unit between October 2007 and January 2008. Data were collected from patient notes and computer records using a standard proforma.

Outcome and results:

- Of 2898 admissions, 89% were reviewed by a senior physician within 24 hours (n=2579), 98.6% were seen within 46.5 hours and one patient was not reviewed at all
- A total of 7% (n=191) of patients were referred to specialty departments, and all but one seen by the correct specialty. Only 52% of patients were seen within 24 hours of referral (median time 24 hours)

- Of patients seen by specialties 50.7% were transferred to the appropriate department, and 47.8% were discharged from the integrated assessment unit after an appropriate care plan was devised.

Conclusions: This integrated assessment unit functions well in reviewing patients and referring correctly to specialties. However, checks are needed to ensure all patients are seen within 24 hours by a senior physician. Patient review by specialties has a major positive impact on discharges. However, with only half of all patients referred to specialties being seen within 24 hours, earlier review is needed to optimize patient care and increase the throughput of patients on acute wards, where demand for beds is so high.

Conflict of interest: none.

Impact of a clinical decision unit on emergency medical receiving

AFB Kernohan, Medical Receiving Unit, SJ Gallacher, Department of Endocrinology and Metabolism, P Munro, Emergency Department, Southern General Hospital, Glasgow

Clinical decision units are becoming an important means of delivering structured multi-disciplinary emergency care for patients with pre-specified low–moderate risk conditions. We have combined the clinical decision unit role with that of a 'step-down' area from our acute rehabilitation unit (patients with estimated date of discharge time of 24–48 hours). Previous reports have called for more research into the effect of clinical decision units on the overall emergency care process.

We describe the impact of opening a ten-bedded clinical decision unit (Monday 10 am–Thursday 5 pm) on acute medical receiving in a teaching hospital. A 5-week pilot period (February–March 2008) is compared with the same period in 2007.

Mean daily admissions to the unit were 8.8 on Mondays, falling to 1.2 on Thursdays. A total of 73.5% of admissions were direct from the emergency department and 26.5% were 'step-down' patients. 85% were discharged directly. By comparison with matched patients from 2007, the total length of hospital stay was reduced from 47.29 hours to 26.38 hours (P<0.001). Mean medical admissions increased by 13.3% (25–28.3/day) while 'boarders' (patients admitted directly to 'non-receiving' wards) decreased by 74.5%. On busier days (admissions ≥30) compliance with the 4-hour emergency department target improved from 91.5% to 97%. An integral part of our clinical decision unit/acute rehabilitation unit is now a medical nurse practitioner working alongside medical staff and ward nurses, coordinating and delivering patient care along pre-specified pathways.

We have demonstrated meaningful improvements in the emergency care process for medical admissions since opening this ten-bedded unit. There are inefficiencies associated with opening for 3.5 days, and longer opening is recommended. The role of the medical nurse practitioner is evolving.

Conflict of interest: none.

What is the role of geriatricians in the acute medical unit? Experience from our practice

H Bayes, K Leckie, Acute Medicine and Medical Specialties, P Birschel, Department of Geriatric Medicine, Southern General Hospital, Glasgow

Aim: Recent years have seen an evolution in acute medical services for elderly patients, with increasing integration of the geriatrician into medical admission units. We evaluated the impact of a dedicated geriatric receiving team in a city teaching hospital with a catchment population of 225 000.

Methodology: Social, medical and demographic data were collected prospectively for all patient aged over 75 years admitted to our medical admission unit over a 2-week period. Patients were followed up over 2 months to ascertain outcome and access to rehabilitation services.

Results: Over this period 274 patients were admitted to the medical admission unit, with one-third aged over 75 years. Of all appropriate elderly patients 78% (35/45) were seen directly by the acute geriatrician. These patients had a median of three comorbidities (interquartile range: 2–4), 66% of patients had mobility problems identified at admission, with 83% of patients requiring formal or informal home care.

Under the care of the geriatric team 63% and 42% more elderly patients received physiotherapy and occupational therapy respectively, compared with general physicians (in both comparisons P<0.001). Rehabilitation was also commenced 2–3 days earlier in these patients. Patients stayed a median of 5 days longer on geriatric compared with medical wards, with 7% remaining as inpatients at 2 months.

Conclusions: This study of our practice highlights the benefits of a dedicated acute geriatric team within a medical admissions unit. The acute geriatrician assessed a considerable proportion (13%; 35/274) of acute medical admissions directly. Rehabilitation needs were identified earlier and more frequently under the geriatric team, with potential benefits to outcome. Service development elsewhere should consider these findings.

Conflict of interest: none.

TISS-28 in a teaching hospital acute medicine unit

A Vaidya, M Dixon, H Wilson, J Southgate, Norfolk and Norwich University Hospital Foundation Trust

Aim: To investigate TISS-28 (Therapeutic Intervention Scoring System-28) in assessing the nurse:patient ratio in an acute medicine unit.

Background: TISS-28 is a scoring system used to evaluate resource utilization in critical care. One point is equivalent to 10.6 minutes of nurse time in an 8-hour shift. Interventions are allocated points according to nurse time required. A high TISS-28 score is associated with increased mortality.
Method: TISS-28 was calculated prospectively on 50 patients on admission to the acute medicine unit. The level of nurse intensity in minutes of work was compared with the nurse:patient ratio.
Results: TISS-28 scores varied from 3 to 30 with 14% over 20. On the advanced care area the four patients required up to 689 minutes of nursing time. The average dependency in the augmented care area was 138 minutes per patient per shift.
Discussion: This concept is useful in assessing acute medicine unit workload. A nurse working an 8-hour shift has a maximum 400 minutes of work to deliver, indicating a deficit in the nurse:patient ratio of over 3 hours per shift. TISS-28 underestimates the time required for acute medical patient care.

The rapid turnover of patients on an acute medicine unit and case-mix require a reworking of this score to reflect acute medicine unit activity. A scoring system is in development to improve acute medicine unit cost analysis and nursing provision.

Conflict of interest: none.

Ambulatory care: what is it and do we need it?

Pilot study of a rapid access general medical clinic in a Scottish district general hospital

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Aim: Rapid access clinics have reduced admission rates among patients requiring assessment for chest pain. No data exists for general medical clinics. There is no halfway point between emergency admission and 6 weeks for an outpatient appointment. We aimed to determine if a rapid access general medical clinic could provide a viable alternative to hospital admission.
Methodology: Six daily weekday slots were allocated for a same or next-day service using the existing medical assessment unit infrastructure to allow cost neutrality. Patients were referred to the clinic by GPs, or triaged into the clinic by the admitting medical team if this was felt more appropriate than admission.
Outcomes and results: Forty patients were seen in 40 days. The median time to complete assessment and treatment was 3 days. Sixteen out of 17 patients (94.1%) originally referred for admission were successfully treated as an outpatient. Given that the median length of stay in our unit is 6.8 days this saved a potential 108 bed days.
Conclusions: The data from the first 40 days of the rapid access clinic suggest that a sustainable, cost-neutral service can be delivered which results in a significant reduction of bed days with no cost to patient care. Further study is planned to include a larger cohort of patients by opening the clinic to referrals from the emergency department and out of hours GP services.

Conflict of interest: none.

A unique model of 'ambulatory care unit' in acute medicine (a primary care facility in a secondary care organization)

S Ahmed, Acute Medical Unit, L Sutton, Advanced Nurse Practitioner, Stepping Hill Hospital

Background: Historical boundaries between primary/secondary care are blurring. This has led to innovative mechanisms, focusing on admission avoidance and improving the patient experience. The authors discuss an innovative 'ambulatory care' 'department' which demonstrates cost-effective, patient-centred, high-quality care.
Facility: The facility encompasses a five-bedded-unit, with three designated assessment areas, supported by dedicated acute physicians and committed medical and nursing staff. Service provision is predominantly on weekdays, facilitating 24-hour access including out-of-hours. The ultimate aims are:
1. Providing instant-access specialist medical advice
2. Improving 'treat and discharge' facility
3. Decreasing acute medical admissions.

Objectives:
1. Providing rapid and unique assessment, facilitating specialist review and outpatient management of varied illnesses, mostly from GPs
2. Daily rapid access follow-up clinic of patients discharged from the acute medical unit
3. Daily rapid access to alternative service providers (i.e. stroke nurse specialist, diabetic nurse specialist), facilitating early discharge
4. Facilitating urgent blood investigations, with prompt response and treatment
5. Accommodating day attendees
6. Arranging semi-urgent blood transfusions
7. Occasional overnight monitoring before specialist review.

Performance survey: A performance survey from September 2007 until March 2008 focused on admissions, discharges, readmissions, day-attendees, deaths and complaints. There was a total of 1752 admissions, averaging 250 per month; in addition there were 10-plus daily attendees. Approximately 73% of discharges occurred the same day. Rapid patient movement means that average length of stay is unavailable. The readmission rate was 2.6%, with no deaths or patient complaints.
Conclusions: This facility provides a unique and efficient service focusing on admission avoidance and

improved patient experience, transgressing primary and secondary care boundaries. Future aspirations include developing ambulatory pathways, i.e. instant access, self-referral clinics, rapid access and capacity facilitating admission avoidance.

Conflict of interest: none.

How is multi-professional training optimized in the acute environment?

Do we need to improve training in non-invasive ventilation for acute respiratory failure?

C O'Dowd, H Bayes, Department of Respiratory Medicine, Southern General Hospital, Glasgow

Aim: Non-invasive ventilation services have increased in UK hospitals, with junior doctors often involved in the 'out-of-hours' care of non-invasive ventilation patients. We assessed medical trainees' knowledge of non-invasive ventilation.

Methodology: We surveyed trainees at the end of a training year working within the medical unit of a city teaching hospital. Trainees were included from foundation years (FY) to registrar (SpR) grade. The non-invasive ventilation questionnaire was derived from the British Thoracic Society guidelines (2002), including non-invasive ventilation indications, clinical scenarios and operational practicalities.

Results: Forty-nine trainees completed the questionnaire (response rate: 84%). Of these, 51% had previously worked within a respiratory unit and 80% cover a unit providing non-invasive ventilation out-of-hours.

Twenty four (49%) of trainees had commenced a patient on non-invasive ventilation, while 71% (35) had been involved in the care of an non-invasive ventilation patient out-of-hours.

The most common non-invasive ventilation training source (in 33%) was senior demonstration, but 49% of trainees had no non-invasive ventilation training. There was greater training experience in senior (specialist trainee (ST) 2–SpR) compared with junior doctors (FY1–ST2) (89% *vs* 33%, $P<0.05$).

Indications for and absolute contraindications to non-invasive ventilation were correctly identified by 45% and 18% of trainees respectively, with no significant difference between junior and senior trainees. Senior trainees identified more frequently the correct clinical triggers to commence non-invasive ventilation. Target ventilator settings and oxygen saturation values were correctly identified by 29–35% and 70% of trainees, respectively.

Conclusions: Non-invasive ventilation is widely used in UK hospitals, usually within a multidisciplinary setting with the help of nursing staff. As a consequence, medical trainees' knowledge can be lacking, as shown by our study. An improvement with trainee seniority was evident but overall standards need to be better. Our study highlights the importance of developing formal training and directly observed assessment of trainees in non-invasive ventilation. Such a programme is now being established in our hospital. The recent introduction of a region-wide protocol, as well as ensuring that all units use the same ventilators, will help in this process.

Conflict of interest: none.

What are the appropriate standards for acute medicine?

Audit of emergency admissions

J Osborne, B Clayton, J Atkinson, James Paget University Hospital NHS Foundation Trust, Great Yarmouth

Background: The National Confidential Enquiry into Patient Outcomes and Deaths suggests emergency admissions are seen by consultants at the earliest opportunity, ideally within 12 hours and not exceeding 24 hours. The earliest consultant review should be documented in the notes and subject to local audit.

Aims and objectives:

- To audit the James Paget University Hospital emergency admissions and discharge unit department documentation in line with recommendations
- To check consultant review targets are met.

Methods: Two hundred inpatient admission books were collected opportunistically between August and December 2007. Exclusion criteria included: admission <24 hours, those who died and admissions not via the emergency admissions and discharge unit department. Key questions included:

- Time of admission
- Time of initial assessment
- Time of consultant review
- Overall time from admission to consultant review.

Other data included clarity of documentation, identity and grades of clinicians. These findings were presented at the emergency division clinical audit and effectiveness meeting.

Key results:

- 47% of all admissions did not have the time recorded
- 69% of all admissions breached the 12-hour recommendation*
- 45.5% of all admissions breached the 24-hour recommendation*
- The average time to consultant review was 12 hours and 12 minutes.

(*This includes those records where review time could not be calculated because there was inadequate completion of admission details in patient notes.)

Conclusions:

We have between 50 and 75% of admissions failing the 12- or 24-hour recommendation.

Recommendations:

- All entries are correctly dated and signed
- Entries should be legible
- A single standard of recording time of patient arrival

- Re-audit for significant improvement to data following implementation of changes.

Conflict of interest: none.

Adherence to the Surviving Sepsis Guidelines: six-hour bundle

G Agarwal, Maidstone and Tunbridge Wells NHS Trust, London KSS Deanery

Aim:

- To assess the level of adherence against International guidelines: the 'Surviving Sepsis Campaign' and 'Sepsis Six Bundle'
- Identification of septic patients and implementation of early goal-directed therapy.

Methodology:

- Retrospective review of randomly selected blood culture positive patients' notes (October–December 2007)
- Extensive education programme for nurses and junior doctors across both sites of the trust (January–February 2008)
- Prospective audit of all patients suspected to have severe sepsis (March–June 2008).

Outcomes and results:

- Forty patients were reviewed retrospectively and 45 prospectively with a median age of 69 years and a male to female ratio of 1:1
- The most sensitive markers for identifying sepsis were respiratory rate (22%) and heart rate (24%)
- The commonest evidence of organ dysfunction were hypoxaemia (82%), oliguria (69%) and hypotension (59%)
- Within 1-hour targets, marked improvement was seen between the retrospective to the prospective audit especially in catheterization (52% to 70%) and early senior review (35% to 80%)
- Although there was a slight improvement in achieving 6-hour targets, only a quarter of the patients received the appropriate management in time
- Early recognition lead to a threefold rise in intensive care unit admission and a 25% reduction in overall mortality (increased survival to hospital discharge).

Conclusions:

- Education and training promoted early recognition and better management of patients with severe sepsis and septic shock, resulting in a 25% reduction in mortality
- Clear documentation, further training and annual re-audit are essential in continuing improvement.

Conflict of interest: none.

Implementing principles and standards for urgent care

B Pearson, Derbyshire Royal Infirmary

Aim: To create, agree and implement principles and standards for urgent care.

Methodology: Collaboration and discussion among clinicians, managers and service users resulted in an internal paper entitled 'Principles and Standards for Urgent Care'. This details process requirements for managing patients with urgent care needs, applicable across all areas and deliberately not condition-specific. Key performance indicators and improvement trajectories were agreed at our Trust Management Team and are measured to enable effective service improvement.

Outcomes: Implementing nine principles and standards will improve the quality and outcome of urgent care for patients:

1. Single communication point of access for all urgent referrals
2. Immediate triage upon arrival
3. Timely, senior-led assessment, with all medical records
4. Senior review is indicated by formal clinical assessment and subspecialty protocols
5. All patients have an ongoing care pathway agreed, recorded and communicated
6. Discharge summaries to primary care within national targets
7. Specific care pathways are evidenced, efficient, diagnostic, enable senior judgement and integrate and communicate with primary care
8. The assessment process recommences if patients change clinical teams
9. Diagnostics and treatment interventions occur in a timely manner dictated by specialty protocols; intravenous antibiotics are given within an hour of the decision to treat.

Conclusions: By 2010 we aim to triage patients within 15 minutes, complete clinical assessment within 2 hours, provide senior review within 4 hours, send discharge summaries within 24 hours and give first-dose antibiotics within 1 hour for over 90% of our patients.

Conflict of interest: none.

Winner of the Wesleyan Prize for best poster

Seven days a week service – two quality indicators

M Mallet, Royal United Hospital, Bath

Introduction: Acute medicine is a 7 days-a-week activity. However, many services both within and external to the acute hospital do not reflect this, and the patient experience and quality of service at weekends may differ to that on weekdays. We examined two quality indicators, length of stay and mortality, to see how these varied according to the day of the week patients were admitted under the care of an acute medicine team.

Findings: Hospital activity data were examined for the year ending March 2008. A total of 13 396 patients were admitted (mean age 67.3 years, range 16–106 years), and 6337 (47.3%) of these were subsequently discharged by

the acute medicine team; the rest were transferred to others for ongoing care.

Length of stay: Fewer 0-day and more 1- and 2-day lengths of stay were noted following admission at weekends. This variation was more marked for those discharged from other medical teams.

Mortality: Overall in-hospital mortality was 997/13 396 (7.44%), with a non-significantly increased risk of death following admission at a weekend compared to a weekday. Early mortality (those dying with a length of stay of 0–2 days) also varied by day of admission, with an increase in mortality for those admitted at weekends compared to weekdays (relative risk 1.41, P=0.002), and on Fridays to Mondays compared to those admitted midweek (relative risk 1.63, P<0.001).

Conclusions: Length of stay and early mortality for acute medical admissions vary by day of week of admission in our hospital, particularly around the weekends. A true 7-day service across the whole health community is difficult to provide in practice with current resources.

Conflict of interest: none.

Audit of the quality of upper gastrointestinal endoscopy referrals from a medical assessment unit

S Brown, F Yong, S Gilson, L Albon, N Winnike, M Green, Queen Alexandra Hospital, Portsmouth Hospitals NHS Trust

Background: Acute gastrointestinal haemorrhage is a common cause of medical admission and is associated with a high mortality rate. Upper gastrointestinal endoscopy plays a pivotal role in diagnoses and the therapeutic management of haemorrhage. However, lack of information in endoscopy referrals makes assessment of severity and urgency of endoscopy difficult. We audited the inclusion of Rockall score, blood test results and drug history in endoscopy referrals and re-audited data inclusion after the introduction of a new form.

Methods: Referral forms were collected from October to November 2007 and were audited for inclusion of Rockall score, haemoglobin level, international normalized ratio (INR) and drug history. These parameters were re-audited from February to March 2008. Between cycles a new form was introduced containing separate boxes for Rockall score, haemoglobin level, INR and medications.

Results: In the initial audit, no forms contained Rockall score, 88% contained haemoglobin level, 33% contained INR and 24% contained drug history. In the second cycle, 28 out of 42 forms collected were the new forms, enabling a direct comparison. Of new forms 64% contained Rockall score, 93% contained haemoglobin level, 36% contained INR, and 86% contained drug history.

Conclusions: Data inclusion was poor in the first cycle of audit, thus hampering the prioritization by the endoscopist. The new forms have increased awareness among doctors within the medical assessment unit, which has resulted in increased levels of information. However, the current level still fails to meet standards. We recommend an education session for staff on the medical assessment unit together with an aid to calculating the Rockall score to simplifying the completion process and further re-auditing.

Conflict of interest: none.

Evaluation of a physiological track-and-trigger warning system for identifying acutely ill patients during the out-of-hours period

A Patel, B Mendes, A Gupta, GA Thomson, DJ Fernando, I Idris, Sherwood Forest Hospitals Foundation Trust, Nottinghamshire

Aim: Physiological track-and-trigger warning systems are used to identify patients on acute wards at risk of deterioration. This is particularly crucial for patients presenting during the out-of-hours period. Since effective and safe management of these patients has recently emerged as a key challenge for NHS organizations with the introduction of the Hospital at Night programme, we undertook an audit to assess our performance.

Methods: Ninety-six consecutive eligible patients were audited for the assessment of routine bedside observations and the application of a track-and-trigger system. On-call medical team review was also audited for the number of physiological parameters measured and the quality of their subsequent management plans. All information obtained was compared with the National Institute for Health and Clinical Excellence (NICE, 2007) guidelines *Recognition of and response to acute illness in adults in hospital*.

Outcome and results: A total of 88.5% of patients had observations 12 hours before acute illness and just 49% of acutely unwell patients had the track-and-trigger system applied before informing the on-call medical team. Furthermore, only 13.5% of the patients had all six of their minimum physiological parameters measured at initial assessment. Management plans had no formal grading of response in 79.2% of cases, 80.1% had no parameters for nurses to specifically observe and most importantly 95.8% had no trigger to highlight the need for escalation of care.

Conclusions: This audit highlights the need to educate both medical and nursing staff about methods which can aid recognition of deteriorating health, to prevent unnecessary delay or inappropriate management. We propose a new combined observation chart that could be used in place of the current observation charts.

Conflict of interest: none.

National Institute for Health and Clinical Excellence (2007) *Acutely ill patients in hospital: recognition of and response to acute illness in hospital.* Clinical guideline No. 50. National Institute for Health and Clinical Excellence, London (www.nice.org.uk/CG050 accessed 11 December 2008)

Chest X-ray interpretation in patients presenting to medical assessment unit with infective exacerbation of chronic obstructive pulmonary disease: comparison between clinicians' and radiologists' interpretations and implications on clinical decision and management

MJ McDonnell, B Chandrappa, A McCullough, County Durham and Darlington NHS Foundation Trust, County Durham

Introduction and objectives: Chronic obstructive pulmonary disease is the fifth leading cause of death worldwide. Chronic obstructive pulmonary disease exacerbation is diagnosed on the basis of history, examination and chest X-ray. We performed a prospective observational study of patients attending medical assessment unit with chronic obstructive pulmonary disease exacerbation in one trust over a 6-month period to determine if there was any correlation in chest X-ray interpretation between clinicians and radiologists, and to assess if this had any impact on clinical decision and management.

Methods: Data were collected on all patients presenting in this timeframe with chronic obstructive pulmonary disease exacerbation. We compared chest X-ray findings of clinicians with those of radiologists and compared the proportion of patients started on empirical antibiotics with those correctly identified as having evidence of true infective exacerbations by the presence of radiological pneumonia.

Results: The mean age for the 45 successive patients identified was 71.8 years (range 46–91 years). Discrepancies were noted in 17.8% patients who were inappropriately treated with antibiotics for presumed pneumonia-related exacerbation by clinicians where no radiological evidence of infection was reported. Furthermore, 4.5% patients with definite radiological evidence of infection did not receive any antibiotics. Adverse effects were noted in 4.5% patients with half developing *Clostridium difficile*.

Conclusions: Considerable variability between clinician and radiologist chest X-ray interpretation was noted. Recommendations include a facility for rapid radiological opinion to reduce the threshold for inappropriate antibiotic use.

Conflict of interest: none.

The Payment by Results national tariff severely penalises efficiency and early hospital discharge – a cost analysis

S Moreea, SM Alam, AR Brown, Bradford Hospitals Foundation Trust

Background and aim: In 2005 Payment by Results structured around Healthcare Resource Groups became the payment basis for secondary care (the national tariff). We have found a flaw in this system: the short stay tariff, which applies to Healthcare Resource Groups, where only 20–50% of the national tariff is paid if patients have a length of stay of <2 nights in hospital.

Method: We obtained the Healthcare Resource Groups and length of stay for patients admitted in general medicine in 2007. We identified the Healthcare Resource Groups where the short stay applies and used the 2007 Payment by Results national tariff to calculate the additional income that would be generated if these patients were kept in hospital for at least 2 nights. We calculated the extra number of beds required to sustain this.

Results: From the 20 660 attendances in 2007, 55% (11 383) had a length of stay of <2 nights and 32.8% (6787) met the criteria for the short stay across 45 Healthcare Resource Groups. We analysed the data from 4748 patients (70%). If all of these patients has a length of stay ≥2 nights, the 2002 patients who stayed ≤1 night would have brought in an additional income of £2 271 021, and the 2746 who stayed >1 night but <2 nights have brought in an additional income of £3 446 799; a total of £5 717 826. Sixteen additional beds (85% occupancy) would have been required at a cost of around £1 million per year.

Conclusions: The current national tariff is flawed and penalizes hospitals with a fast turnover of patients. An expansion of the medical bed base would remedy this.

Conflict of interest: none.

Appropriate management of suspected pulmonary thromboembolism in the acute medical unit

H Bayes, C O'Dowd, A McKay, S Davidson, Department of Respiratory Medicine, Southern General Hospital, Glasgow

Aim: Suspected pulmonary thromboembolism is a common presentation to acute medical units. British Thoracic Society guidelines outline a standard of care. Despite British Thoracic Society recommendations, D-dimers are not available in a number of UK hospitals, including our unit. The British Thoracic Society also highlight the need for outpatient pulmonary thromboembolism management algorithms. We assessed the appropriateness of suspected pulmonary thromboembolism investigation in an acute medical unit and potential utility of a prediction rule identifying patients suitable for early outpatient management.

Methodology: We prospectively studied consecutive admissions with suspected pulmonary thromboembolism, over 12 weeks, to a city teaching hospital without D-dimer availability. Clinical probability, chest X-ray findings, potential causes of false-positive D-dimers, computed tomography pulmonary angiogram and ventilation-perfusion scans and diagnostic outcome were recorded. Patients were scored with the prediction rule suggesting suitability for outpatient treatment.

Results: Eighty patients were included; 60% of whom were female. The median age was 53 years (interquartile

ratio: 41–69 years). Seventy per cent had low clinical probability scores. One third had an alternative diagnosis on chest X-ray, most commonly consolidation. However, high numbers underwent computed tomography pulmonary angiogram (61/80; 76%). Pulmonary thromboembolism was confirmed in 10% of patients.

In those without potential false-positives, D-dimers could reduce further investigation in low or intermediate probability cases by 59% (47/80).

In the study cohort, 48% (38/80) would be deemed suitable for potential outpatient management.

Conclusions: Acute physicians' confidence in excluding pulmonary thromboembolism remains low. Despite low probability scores and alternative radiological diagnoses, many undergo further imaging. We confirm that D-dimers have an important role in reducing further investigations, with benefits in cost and radiation-exposure reduction. A prediction rule shows promise in identifying patients suitable for outpatient pulmonary thromboembolism management.

Conflict of interest: none.

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