General internal medicine and specialty medicine: time to rethink the relationship

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The problem

There is an increasing conflict of interest between factors leading towards increased specialisation and factors making it imperative to retain high quality general medicine. These include the following:

Factors leading towards increased specialisation:

• pressures from patients, their relatives and general practitioners, and medico-legal pressures for all patients to be seen by an appropriate specialist
• a perception that consultants are appointed, and subsequently judged, on the basis of their performance as specialists
• the increasing complexity of diagnostic procedures and treatments.

Factors making it imperative to retain high quality general medicine:

• much of the patient workload consists of elderly patients with multiple pathologies
• only large hospitals can provide on-call cover for all specialties all the time
• trainee doctors need training in the whole range of general medicine
• generalist skills will still be needed for the initial diagnosis of many acute admissions.

Some numbers

The specialty distribution of acute emergency medicine

In 1996, a national audit of acute medical admissions was carried out by the Research Unit of the Royal College of Physicians (RCP). Of the 3,385 randomly selected case notes for hospital inpatients reviewed at 42 district general hospitals (DGHs), 69% were admitted under a general medical firm and 30% under a care of the elderly team. It proved possible to classify the patients' diagnoses by system in 74% of cases (Table 1); in 25%, the diagnosis was either multiple or non-specific, and in 1% no diagnosis could be made from the case records.

Table 1 also includes data from a recent survey of 12 months' activity (October 1996 to October 1997) at the Royal Liverpool University Hospital. All medical admissions are listed, including those (eg myocardial infarction (MI)) not admitted via the admissions unit. During this period there was an average of about 60 acute medical admissions per day. The specialty distribution of these cases is shown according to their primary admission diagnosis, averaged over a 12-month period. The finished consultant episodes data are not robust as some patients will have been coded more than once, but nevertheless give a distribution similar to the bed occupancy data.

Also given in Table 1 are published data from a study at Queen's Medical Centre, Nottingham, based on a survey of admissions to an admissions ward over an 18-month period. It shows relatively high figures for cardiology and low figures for respiratory problems. It should, however, be noted, first, that 31% of admissions did not come through the admissions ward, and are therefore not represented in this survey and, secondly, that the City Hospital, which shares the acute medical admissions for Nottingham, contains the academic respiratory unit. The specialty distribution for the RCP and Liverpool audits are in close agreement.

Quantifying the role of geriatrics

Computerised discharge documentation (ICD10) is according to diagnosis rather than patient needs, so the geriatric workload is hard to quantify by this means. The RCP audit, which was case-note based, showed that 30% of acute medical admissions were under the care of geriatricians; this seems the best available estimate since it is based on 42 hospitals, each with more than 400 beds. It includes a wide range of practices, with 23 of the surveyed hospitals
operating an age-related policy for geriatric admissions, four a needs-related policy, and others a mixture of the two with variation according to bed availability.

Workload implications of combining general medicine and specialty: gastroenterology as an example

A survey of gastroenterologists in England and Wales in 1997 conducted by the British Society of Gastroenterology showed that 85% had a commitment to general medical intake. Median intake size was 18, with a maximum of 60, but during cover for absent colleagues these figures increased to 38 and 100, respectively. In an average DGH serving a population of 250,000 and with two consultant gastroenterologists, the gastroenterology specialty commitments alone are recommended to include two outpatient clinics, three endoscopy sessions and one nutrition session per consultant per week. Such heavy combined general medical and specialty workloads are probably not only unsustainable in the long term but incompatible with continuing medical education, training and research.

The current situation: allocation of patients to specialists and generalists

The national audit conducted by the RCP in 1996 showed that at that time only 30% of acute medical admissions were looked after by a relevant specialty firm:

- 21% by virtue of admission under that specialty—presumably by chance because it was its admitting day
- 9% by subsequent referral to the relevant firm.

There was, however, wide variation between hospitals, with 7–60% of patients admitted under the relevant specialty firm. We are aware of several hospitals that have introduced some form of specialty triage since the audit was conducted, so these percentages would probably rise if the audit were repeated now.

The current distribution of consultants by specialty

Table 2 shows the current distribution of consultants by specialty, according to a census conducted by the RCP on 30 September 1997.

Evidence that patients fare better if managed by a specialist relevant to their principal problem on admission

It is now over 15 years since UK senior registrar posts were last advertised in general medicine without any named specialty, and almost all UK consultant physicians appointed since then have trained in a specialty as well as in general internal medicine (GIM). It might seem reasonable to assume that this specialist training produces doctors able to provide better care for patients with problems relevant to their specialty. A Medline search to seek direct evidence for or against this assumption was made from 1966–1998 using keywords ‘specialty’ and ‘x’ (where

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**Table 1. Distribution of acute medical admissions by principal problem on diagnosis: results of four UK-based audits.**

| Principal problem         | RCP national audit admissions (%) | FCEs (%) | Bed-days (%) |
|---------------------------|-----------------------------------|----------|--------------|
| Cardiology                | 29                                | 28.8     | 23           |
| Respiratory               | 27                                | 24.6     | 26.5         |
| Gastrointestinal          | 13                                | 12.7     | 28.8         |
| Stroke                    | ?*                               | 3.2      | 7.2          |
| Geriatrics*               | -                                 | -        | -            |
| Endocrine**               | 3                                 | 1.5      | 1.6          |
| Musculoskeletal           | 2                                 | -        | 4.1          |
| Renal                     | 2                                 | 1.3      | 1.3          |
| Pharm/Toxin†              | -                                 | 2.4      | 0.9          |
| Dermatological            | <1                                | 1.8      | 2.4          |
| Infectious diseases       | -                                 | 1.3      | 1.1          |
| Epilepsy                  | ?*                               | 1.2      | 1.0          |
| Head wound                | ?*                               | 0.8      | 0.9          |
| Other                     | 25                               | 16       | 17           |
| Overdose                  | -                                 | 0        | 0            |
| Total no.                 | 3,385                            | 25,185   | 132,495      |

* RCP audit included 20% as neurology, although noting that <1% were looked after by neurologists. The Liverpool and Nottingham audits identified stroke and epilepsy separately (in Liverpool, the neurologists look after inpatients only at the regional centre on another site, and are not involved in the management of acute medical admissions).

** This percentage relates to the principal problem on admission only. The proportion of patients with diabetes is likely to be considerably higher (eg 8.4%).

† In Liverpool, most overdoses are looked after by accident and emergency staff in an observation ward.

FCE = finished consultant episode; RCP = Royal College of Physicians.
management of stroke. A systematic review of 19 trials has shown a 31% reduction (95% CIs 18–41%, \( p = 0.0001 \)) in the combined outcomes of death and dependency when patients are managed by a specialist stroke unit compared with management on a general medical ward\(^9\).

Finding a compromise

‘Next-day specialty triage’

The RCP national audit of acute medical admissions has shown that 74% of admissions can be defined according to one of five specialties: cardiology, respiratory, gastroenterology, endocrine and geriatrics/stroke. It is doubtful whether any UK hospitals have enough specialists to provide continual hands-on consultant cover in all these specialties. It is possible, however, to envisage a compromise solution in which all specialists take their turn to cover the 24-hour take as general physicians, but with patients transferred to the most appropriate specialty team the morning after admission. If each specialty team has enough staff to provide one specialist ward round per day, this will ensure that the majority of patients are seen by the appropriate specialty team within 24 hours of admission, although there will still be problems at weekends and public holidays.

For this system to work well, a high priority would need to be given to transferring patients, if necessary, between wards to ensure they are sited on the appropriate specialty ward, even at times of high bed occupancy. It also needs to be accepted that some patients have more than one pathology, but that triage according to the main problem precipitating the admission should allow a reasonably fair allocation of cases. Triage to the geriatrics team could be needs-based, age-based, or a combination of the two, for example all strokes plus age over 80 (Appendix A). The RCP audit data suggest that it may be realistic to aim for specialty triage in 75% of cases. The remaining 25% could either be kept under the care of the admitting team or be transferred on the morning after admission to the team responsible for the ward to which the patient has been admitted if, as is increasingly the case, a ward-based system of medical cover is adopted.

Implementation in a medium sized or large district general hospital

The adoption of a ‘next-day triage’ system would have obvious implications for an increase in respiratory and cardiology staff, although these increases might not be as large as might first appear when the reduced role for these specialists in the continuing care of patients with problems outside their own specialties is taken into account. If it is accepted, first, that it is not a good idea for any specialist to work in isolation and, secondly, that specialties such as diabetes/endocrinology and gastroenterology have relatively large (but differing) outpatient/procedure
workloads, the smallest workable model serving a population of about 200,000 would necessitate the consultant specialist distribution shown in Table 3.

This model is based on the approximate distribution of medical inpatients across the medical specialties (cardiology 29%, respiratory 27%, gastroenterology 13%, diabetes/endocrinology 5%, geriatrics 30%+), taking account also of the differing outpatient and endoscopy workloads of the specialties as defined in Recommendations for Appropriate Consultant Workloads documents produced by the cardiology, respiratory, diabetes and endocrinology, and gastroenterology and hepatology specialist committees of the RCP. It is of course not a rigid model, and local variations will be appropriate to account for variations either in a) demand (eg due to different local prevalence of ischaemic heart disease), or b) consultant job description (eg linked appointments in geriatric medicine/other specialty, accident and emergency (A&E) medicine/other specialty). These figures are in keeping with the recommendation from the RCP that there should be one specialist physician in each major specialty per 80,000 population.

Geriatric consultant requirements will be dictated partly by local demography and partly by local variations in the role of geriatricians in the management of acute medicine. However, the audit data suggest that it would be appropriate for about one-third of the consultant physician staff to have a specialty interest in geriatrics; this would be in keeping with the RCP recommendation for about one consultant geriatrician per 50,000 population or the British Geriatrics Society recommendation for one per 4,000 of the population over 75. This means that DGHs unable to provide 10–12 consultants in general medicine/specialty, plus about five consultants in geriatric medicine, plus all their appropriate support staff, would not be able to operate this system. Smaller DGHs would therefore need to continue to operate a conventional general medical approach to acute admissions, although a strong case could be made that any DGH serving a population of 250,000 ought to have at least 12 consultants in general medicine/specialty and five in geriatric medicine.

**Table 3. Consultant specialist distribution for a proposed ‘next-day triage’ system to cover a 200,000 population.**

| Specialty                  | No. of WTE consultants |
|----------------------------|-------------------------|
| Respiratory                | 3–4                     |
| Cardiology                 | 3–4                     |
| Gastroenterology           | 3                       |
| Diabetes/Endocrinology     | 2–3                     |
| Geriatrics                 | 5                       |

WTE = whole-time equivalent.

Small district general hospitals

According to the 1997 Medical Directory, there are currently 50 hospitals in England and Wales with 12 or more consultant physicians involved in management of acute medicine (not including geriatricians), a further 14 with 10–11, but 188 with fewer than 10 consultant physicians, including 145 with fewer than eight. If the 57 hospitals with 8–11 consultant physicians were brought up to a minimum complement of 12 by the addition of 171 new posts, and assuming an expansion in consultant geriatrician posts in keeping with the RCP aim of one post per 50,000 population, there would then be 107 hospitals with a sufficient complement of consultant staff to operate a specialty triage system for medical admissions. The 145 hospitals with fewer than eight consultant physicians in specialties other than geriatrics would need either to be considerably expanded or to consider merger.

The roles for diabetes/endocrinology, clinical pharmacology and other specialties with a small percentage share of triage medical admissions

According to published figures, only 2–5% of acutely admitted medical patients have diabetes or another endocrine problem as their primary cause for admission. A much higher percentage will actually have diabetes (eg 8.4% of acute admissions), and the low percentage for diabetes as the cause of admission undoubtedly reflects the marked improvements in outpatient care of diabetic patients. If some form of specialty triage is introduced, some change will be needed in the working practice for specialties such as diabetes/endocrinology and clinical pharmacology. Consultants in these specialties will continue to be much needed to take their share of the rota for management of the first 24 hours' take. Some reduction in their bed-base might be appropriate, but one alternative might be a strengthened link between diabetes/endocrinology and cardiology with an increasing role for diabetologists in the management of cardiovascular disease (justified by the knowledge that 75–90% of mature diabetics are destined to develop coronary artery disease).

Another alternative, preferred by the consultants at the Royal Liverpool Hospital, is the identification of patient groups who can be preferentially triaged to the diabetologists and clinical pharmacologists (Appendix A), bearing in mind that all specialty teams can also expect to look after approximately 25% of patients without a clearly defined principal problem which defines them to a specific specialty within 24 hours of admission.

All specialties allied to general medicine including diabetology, cardiology and, in many cases, nephrology and rheumatology would continue to take a full share in the management of unselected medical admissions during their first 24 hours in hospital. Thus, the changes in workload resulting from introduction of specialty triage are not as great as might first appear.
The roles of the geriatrician, the consultant in acute medicine and the generalist

Consultant geriatricians vary considerably in their training for and desire to do acute general medicine. Different hospitals have developed, and will continue to develop, different systems for acute medical cover to take this into account, as evidenced by the RCP. It seems unlikely, however, that the specialty of geriatric medicine will be able to expand to cover the whole, or even a major part, of the new medical take at a time when the elderly patient population is expanding so fast. It seems more appropriate for geriatricians to continue to work alongside the other medical specialties, providing a specialist service for the patients whose principal problems are most relevant to their expertise. The RCP audit data suggest that most hospitals have found it easier to implement an age-related policy for geriatric referral rather than a needs-related policy. The introduction of stroke units sufficient in number and size to cope with the direct admission of all patients with acute stroke is however clearly desirable, and is supported by strong evidence for a better outcome. One compromise (Appendix A) is triage of all patients with stroke plus all patients aged over 80 to the geriatric team, although a commoner age base for geriatric care is 75 years.

Most physicians receiving specialty triage patients would still wish to be involved in the initial care of unselected medical emergencies coming to A&E departments. Indeed, this could be regarded as essential to prevent deskilling. However, so much is demanded from consultants to fulfill their specialty role that proper supervision of the ‘medical take’ is difficult. A system increasingly adopted is that of the ‘physician of the week’ (POW), in which a specialist/GIM physician supervises the entire acute medical intake for about a week and is responsible for the immediate supervisory management, working with the junior medical staff on call each day. This allows regular experience of acute GIM, followed by freedom from the unpredictable demands of the acute medical take until the next period of duty on the POW rota.

It has become common practice for hospitals to have an acute medical assessment unit. There is a need for a physician to take responsibility for the organisation of this unit and of the admitting team. It could be one of the physicians in the acute specialties, but an alternative is to appoint a general physician with a special interest in acute medicine. Such posts have already been approved by the RCP, but the success and appeal of these posts have yet to be established.

Implications for consultant numbers

Various forms of modified specialty triage have already been introduced in some larger hospitals in the UK. The widespread implementation of specialty triage would clearly have considerable implications for staffing, with increases particularly in respiratory medicine and cardiology. Several factors would reduce the magnitude of the necessary relative changes between specialties:

- all specialists would be expected to continue to take their turn to look after unselected acute medical admissions until the morning after their admission
- there would be a substantial reduction in the number of patients receiving continued care from inappropriate specialists, which would partly offset the increase in specialty patients for respiratory and cardiac consultants (ie cardiologists would have fewer patients with respiratory problems to look after, and respiratory physicians fewer with cardiac problems)
- about 20–25% of patients would have uncertain diagnoses or multiple problems, and would need to be distributed between all the specialty teams according to bed availability.

More importantly, the total number of consultants would need to be substantially increased if modified specialty triage becomes widely implemented in medium-sized DGHs. Small DGHs, serving smaller – but probably more remote – catchment populations, would still need a full complement of consultant physicians to allow them to provide an equally high quality service. A greater consultant/population ratio would be required in those hospitals.

Implications for training and teaching

House and senior house officers

Training in general medicine at senior house officer level should not be much affected. The admitting teams will continue to have responsibility for unselected acute admissions for the first 24 hours, and a 3–6 month rotation should ensure a good exposure to all acute specialties. House physicians will similarly gain experience of unselected acute admissions, and three-monthly rotations should allow a good range of experience.

Specialist registrars

Training in general medicine for specialist registrars is more problematic. Arguably, it is already compromised by the new ‘Calman’ rotations which usually ensure that specialist registrars do most or all their training, including general medicine training, with consultants in their own specialty. There are two possible solutions, either to:

- make a sharper distinction between the general medical and specialist components of the training so that the former can be with consultants from another specialty or to
- introduce a new form of certification in general medicine which would entail rotation around the major specialties. This might usefully include a component working with a consultant in acute medicine in the admissions ward and a component of intensive care medicine.
Medical students

Medical student teaching should not be adversely affected, and arguably could be enhanced. The introduction of new curricula, often with combined medical and surgical firms, has already led to considerable changes in the delivery of clinical teaching. Multispeciality firms should allow students to learn system-specific or needs-related medicine from the relevant specialist. It will be increasingly common for students to be allowed access to patients outside the 'boundaries' of their supervising consultants, which should considerably expand their clinical experience.

Implications for research

For many decades, major clinical advances have been generated predominantly by specialists. Research in DGHs has become the exception rather than the rule, despite the outstanding lead given in the past by physicians such as the groups of Asher, Avery Jones and Doll at Central Middlesex, and Paulley at Ipswich. The relocation of patients so that 75% of a consultant's inpatients have conditions relevant to his specialist interest, rather than the 20% or less often currently found, should greatly facilitate research in the DGH.

Conclusions

General

Although increasing specialisation is inevitable, the medical profession needs to accept that there will always be a need for good training in GIM. These contradictory pressures need tackling in an objective and dispassionate manner, with further careful calculation of the numerical implications of the likely changes in consultant and trainee requirements across specialties.

Specific

1. There is evidence that specialist care is preferable to generalist care for a substantial proportion of acute medical problems.

2. Approximately 75% of acute medical admissions have a clinical problem that can be clearly assigned to a specialty (including geriatrics).

3. Systems should be introduced to maximise the possibility that patients are assigned to an appropriate specialist within one working day after admission.

4. Expansion at consultant level will be required:
   - across all specialties to provide safe levels of cover for small and medium-sized DGHs
   - within cardiology and respiratory medicine in particular, to allow appropriate triage of patients with cardiac and respiratory problems.

5. All consultants with a specialty interest related to general medicine (eg geriatrics, cardiology, respiratory, gastroenterology, diabetes/endocrinology, rheumatology, clinical pharmacology, infectious diseases) should be encouraged to take a share in the care of unselected general medical admissions during their first 24 hours in hospital. This should be an integral part of the contract for any new posts created to facilitate specialty triage.

APPENDIX A

Distribution of patients to specialty teams according to principal problem on admission: the Royal Liverpool University Hospital system.

| Specialty team | Principal problem on admission |
|----------------|--------------------------------|
| Chest          | Moderate-severe chronic airways limitation |
|                | Asthma |
|                | Pneumonia |
|                | Pneumothorax |
|                | Pleural effusion without evidence of heart failure |
|                | Lung cancer |
| Cardiology     | Acute myocardial infarction |
|                | Unstable angina |
|                | Acute arrhythmia |
|                | Cardiac failure |
|                | Pulmonary embolism with haemodynamic changes |
| Gastroenterology| Diarrhoea |
|                | Gastrointestinal bleeding |
|                | Jaundice |
|                | Anaemia |
|                | Non-surgical abdominal pain |
|                | Ascites |
|                | Chronic liver disease |
| Diabetes/Endocrinology | Newly diagnosed diabetes mellitus |
|                        | Uncontrolled diabetes mellitus |
|                        | Diabetic complications (eg foot ulcers) |
|                        | Acute endocrine problems (eg Addison's, hypercalcaemia) |
|                        | Deep vein thrombosis/pulmonary embolism (see also Clinical pharmacology) |
| Clinical pharmacology  | Epilepsy |
| (plus Infectious diseases) | Uncontrolled hypertension |
|                        | Overdose (excluding patients currently cared for by Accident and Emergency on observation ward) |
|                        | Adverse drug reactions |
|                        | Acute infectious disease (eg pyrexia of unknown origin, meningitis and encephalitis, suspected septicaemia) |
|                        | Deep vein thrombosis/pulmonary embolism (see also Diabetes/Endocrinology) |
Nephrology  Renal failure (creatinine >250 mmol/l)
Rheumatology  Acute arthritis
Systemic lupus erythematosus
Connective tissue disorders
Care of the elderly  Stroke
Age >80 years

Category B. Non-triage (distributed equally between specialty teams)

- Cellulitis
- Faints/funny turns/dizziness
- Acopia
- Social problems
- Headaches
- Undefinable illness

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