

THE
BENEFITS
OF
CONSULTANT-
DELIVERED
CARE

Copyright © Academy of Medical Royal Colleges 2012

Executive Summary.....	05
------------------------	----

PART 1

THE BENEFITS OF CONSULTANT-DELIVERED CARE.....	07
---	-----------

1 Introduction.....	09
1.1 The Project.....	09
1.2 The purpose of the project.....	10
1.3 What is meant by ‘consultant-delivered care’?.....	10
1.4 Structure of the report.....	11
2 Benefits of consultant-delivered care. The written and oral evidence.....	13
2.1 Rapid and appropriate decision making.....	13
2.2 Improved outcomes.....	14
2.3 More efficient use of resources.....	15
2.4 GPs’ access to the opinion of a fully trained doctor.....	16
2.5 Patient expectation of access to appropriate and skilled clinicians and information.....	16
2.6 Benefits for training of junior doctors.....	17
3 Issues & problems.....	19
3.1 Supply and Affordability.....	19
3.2 Reshaping consultant working patterns.....	20
3.3 Reshaping the consultant career.....	21
4 Conclusions & Recommendations.....	23

PART 2

CONSULTANT-DELIVERED CARE: A REVIEW OF THE LITERATURE AND SUPPORTING EVIDENCE ON THE QUALITY OF CARE DELIVERED BY TRAINED SPECIALISTS AND POST-GRADUATE DOCTORS IN TRAINING.....	25
---	-----------

Abstract.....	27
----------------------	-----------

1 Introduction.....	29
2 Method.....	31
3 Results.....	33
3.1 Evidence of improved consultant care outcomes in strike conditions.....	33
3.2 Evidence of improved care management by consultants in normal working practice.....	34
3.2.1 Comparative studies of trained specialists versus doctors in training.....	35
3.2.2 Other evidence indicating the benefits of care.....	35
3.3 Evidence that consultant-delivered care may not be better than that delivered by doctors in training.....	39
3.4 Evidence that care by doctors in training is less efficient than consultant-delivered care.....	40
3.5 Studies providing evidence that consultants and middle grade trainees appear equally effective.....	44
4 Discussion.....	45
5 Conclusions.....	47

Appendix 1: Evidence as cited chronologically in Part 2 Section 3, indicating year of publication/ place of origin.....	49
--	-----------

Appendix 2: Target of search strategy; electronic data international data base search and professional bodies and organisations.....	50
---	-----------

Appendix 3: Terms adopted for the purpose of this review.....	51
--	-----------

Appendix 4: Key words for literature search.....	52
---	-----------

Appendix 5: Organisations invited and submitting evidence.....	53
---	-----------

Appendix 6: Membership of the Academy Working Group.....	55
---	-----------

References.....	56
------------------------	-----------

Acknowledgements.....	65
------------------------------	-----------



EXECUTIVE SUMMARY

This report examines the evidence for medical care being delivered by fully trained doctors who have either a Certificate of Completion of Training (CCT) or Certificate of Eligibility for Specialist Registration (CESR) and are thus eligible to be on the GMC Specialist Register. i.e. consultant-delivered care. The report does not address the questions of whether care should be delivered by doctors or other clinical groups.

The context and driver for the project is a climate in which it is increasingly asserted that the NHS cannot afford to have the number of consultants that current training numbers will deliver.

The focus of the report is on the quality, outcomes and productivity of consultant- delivered care. It does not address the question of contractual terms and conditions of consultants which should be considered separately.

This report is set out in two parts. The first part is a summary of the written and oral evidence collected by the Academy of Medical Royal Colleges (the Academy) steering group regarding the benefits and difficulties with a system of consultant-delivered care. The second part comprises an externally commissioned independent review of the literature and commentary on the findings.

The key benefits of consultant-delivered care, identified in the written and oral evidence received are:

- Rapid and appropriate decision making
- Improved outcomes
- More efficient use of resources
- GP's access to the opinion of a fully trained doctor
- Patient expectation of access to appropriate and skilled clinicians and information
- Benefits for the training of junior doctors.

Implementing a system centred on consultant-delivered care has its challenges. Supply and affordability have to be addressed. Achieving the benefits for patients of consultant-delivered care for all patients requires greater consultant presence in hospitals than at present and therefore changes to models of service delivery and the working patterns and practices of consultants will be required. This should also lead to re-examining the overall career structure for consultants

The independent literature review cites over 70 individual pieces of evidence, a great number of which are from 2008-2011, and provides the most comprehensive and focused reference source available on this topic.

The evidence includes studies of improved consultant care outcomes in normal working conditions and in exceptional conditions occasioned by the absence of middle grade doctors due to strike action as well as comparative studies of trained specialists versus doctors in training.

In summary

- Numerous reviews by expert clinicians have concluded that patients have increased morbidity and mortality when there is a delay in the involvement in their care of consultants across a wide range of fields including in acute medicine and acute surgery,¹ emergency medicine,² trauma,³ anaesthetics⁴ and obstetrics^{5,6}
- Data from the trainee doctors' strike in New Zealand demonstrated consultant care during the strike was associated with faster patient processing⁷ and decreased hospital stay⁸
- The increased mortality among patients treated in hospitals at weekends has been attributed by expert clinicians to decreased consultant involvement in care^{9,10,11}
- Studies designed to improve patient care which have incorporated earlier involvement of consultants have resulted in better patient outcomes, more efficient use of beds and decreased length of stay.^{12,13,14,15,16} In intensive care similar measures have resulted in better triage and decreased futile care.^{17,18}

Overall, the literature shows that there is considerable internationally shared professional knowledge, expert opinion and some secondary evidence on the quality of care delivered by trained secondary care doctors which should contribute to decisions about the shape of the medical workforce.

Taking what was received in submissions with the international research there is evidence across a wide range of medical fields that consultants deliver better patient outcomes and improved efficiency of care. While this is not based on Level 1 evidence, the consistency of the association between consultant involvement and improved outcomes across many studies in many specialties is compelling.

The Academy believes, therefore, that there are real evidence based benefits to moving to a system of consultant-delivered care. Therefore viewing the increased numbers of doctors coming out of training through a purely financial lens would be a significantly missed opportunity to improve the quality of care.

The Academy concludes that the benefits of consultant-delivered care should be available to all patients throughout the week and recommends that work should be undertaken by clinicians and employers to map out the staffing requirements and service implications of implementing a consultant-delivered service throughout the week.

PART 1

THE BENEFITS OF CONSULTANT-DELIVERED CARE

1. INTRODUCTION

For some time there has been much discussion about the shape of the future medical workforce. With increasing numbers of doctors coming through training, and in the current financial climate, the debate about whether the NHS can or should afford a model of medical care based on consultants is increasingly important.

As part of that debate, the Academy of Medical Royal Colleges (the Academy) undertook a project in 2011 to identify what evidence there is of added benefit to patients in medical healthcare being delivered by doctors who are fully trained – i.e. consultant doctors. The Academy wished to explore openly whether there is evidence to support the case that consultants should deliver the bulk of medical services. The Academy's expectation was that the evidence obtained from the project should be considered in debates or decisions on the future shape of the medical workforce.

1.1 The project

The Academy established a small steering group led by Professor Terence Stephenson, Academy Vice-Chairman and President of the Royal College of Paediatrics and Child Health, to oversee the project.

The work comprised four distinct phases:

1. A call for written submissions from a wide range of stakeholders which specifically asked for:
 - o Views on the benefits of consultant-delivered care
 - o Evidence or examples of the benefits of consultant-delivered care
 - o Changes that would be required to have medical care primarily delivered by consultants
 - o Perceived difficulties with medical care being delivered primarily by consultants
 - o Any other relevant issues

***The list of submissions received is set out in the appendices.*
2. Oral evidence sessions for selected organisations with members of the steering group to explore issues from their evidence in more detail
3. An externally commissioned review of the literature and commentary on the findings
4. Consideration of all the evidence and drafting of the report by the steering group and comment and approval by all members of Academy.

The Academy's aim was to identify the evidence of the benefits of consultant-delivered care. The literature review in Part 2 sets out the evidence obtained. However, from the outset it was clear this was not an area where there was going to be a single piece of scientific 'proof' deciding the issue one way or another. Therefore the opinions, experiences and comments of those who provided written and oral evidence have been crucially important.

1.2 The Purpose of the project

Whatever the concerns or aspirations of individual doctors, this project is not about pay and conditions but about quality and safety of services to patients and what patients can rightfully expect.

The project therefore focussed on issues of outcome, quality and productivity with the emphasis on the service that patients should expect. The Academy recognises that this may require changes in the way that services are delivered and the way consultants currently work.

It is also important to state from the outset that the Academy is not suggesting that it should only be consultants who deliver medical care. The Academy and Medical Royal Colleges fully recognise and support the principle that successful care is based on a team based approach where a range of clinicians along the care pathway contribute to the delivery of a successful outcome.

Staff and Associate Specialist (SAS) doctors have a crucial role in the delivery of healthcare. It is, of course, also essential that trainee doctors provide care to patients as part of their training.²⁰ Equally other clinical professions in nursing, allied healthcare and healthcare science play a fundamental role in the provision of care. There should be a continual and evolving debate as to which clinical professional is the most appropriate to deliver which aspect of care.

This study relates to medical secondary care. However, welcome evidence was received from and relating to general practice. In broad terms the Academy believes that the conclusions relating to care delivered by trained doctors are relevant to general practice. It should be noted that the literature review relates to secondary care rather than GPs.

1.3 What is meant by 'consultant-delivered care'?

The Academy recognised at the outset that the use of the term 'consultant' itself potentially causes difficulties. Equally the term 'fully trained' implies that learning and development is complete which will not be the case.

So whilst recognising that learning is never final, in this context the term consultant means those hospital doctors who have either a Certificate of Completion of Training (CCT) or Certificate of Eligibility for Specialist Registration (CESR) and are thus eligible to be on the GMC Specialist Register.

There is a view that the variation in the CCT between specialties means there is not, initially, a single uniform output from the CCT. However, the term 'consultant' is being used because the Academy believes that it is broadly understood by doctors and the public.

However, the term ‘consultant’ is not meant to be synonymous with the current terms and conditions of the consultant contract. The Academy believes that questions on the pay and career structure for post-CCT doctors should be considered separately from issues relating to the benefit, or otherwise, of care being primarily delivered by consultants.

There is also debate about whether the term consultant ‘delivered’ service is appropriate. The NHS has talked about consultant ‘led’ services and consultant ‘based’ services. The Temple review referred to consultant “presence” but settled on the term consultant-delivered service defining it as “*consultant 24-hour presence, or ready availability for direct patient care responsibility*”.¹⁹ Whilst not all services may require 24 hour presence, it was considered that the term ‘consultant-delivered care’ was the most useful as “*ready availability*” should be common to all services.

1.4 Structure of the report

This report is set out in two parts. Part 1 summarises the written and oral evidence submitted about the both the benefits and difficulties with a system of consultant-delivered care. Conclusions are then drawn from the project as whole.

Part 2 of the report is the detailed independent literature review undertaken for the project. This is concentrated on literature relating to secondary care doctors. It addresses comparisons within medical care and does not seek to examine the benefits of care delivered by doctors and other clinical groups.



2 BENEFITS OF CONSULTANT-DELIVERED CARE THE WRITTEN AND ORAL EVIDENCE

In the written and oral evidence collected received during stage 1 and 2 of the Academy project there was a high degree of consistency and agreement amongst contributors (listed in Appendix 5) as to the benefits of consultant-delivered care. These can be summarised as follows:

- ***A high level of clinical competence ensuring rapid and appropriate decision making***
- ***Improved outcomes for patients which follow from appropriate diagnosis and the most clinically skilled interventions***
- ***Skilled judgement and performance leading to the most effective working and more efficient use of resources through, for example, length of stay reduction or fewer unnecessary investigations***
- ***GP's access to the opinion of a fully trained doctor***
- ***Patient expectation of access to appropriate and skilled clinicians and information in a timely fashion***
- ***Opportunities for benefits for the training of junior doctors***

In setting out these benefits it is not being claimed that all benefits will consistently be available and it is acknowledged that there is obviously variation in consultant performance but there is agreement that these are the benefits of good consultant-delivered care.

2.1 Rapid and appropriate decision making

By definition consultants are the section of the medical workforce with the most experience and training. As a group, they are the highest skilled group of doctors. Whilst this may be self-evident it is important to articulate what this means in practice.

A consultant has the breadth, depth and length of experience not just to recognise diagnoses, take action, investigate appropriately and initiate treatments, but also to acknowledge the unusual, unexpected and unfamiliar. They make rapid and appropriate decisions that benefit patient care. Fully trained doctors use their greater experience and knowledge in primary, elective and emergency care.

They are more likely to reach focussed differential diagnoses and so choose the most appropriate investigations. No amount of didactic training of trainee doctors can substitute for experience and having 'seen it before'. For example, within district general hospitals the anaesthetist is expected to be key to the provision of emergency resuscitation which requires a high degree of competence given the breadth of clinical challenges presented that could not be performed by a junior doctor.²¹

2.2 Improved outcomes

A better clinical outcome for patients has to be the key benefit to be sought from consultant-delivered care. It would, however, be foolish to pretend that there will be a simple or single piece of categorical evidence that demonstrates that consultant-delivered care will always deliver better patient outcomes. However, the junior doctors' strike in New Zealand referred to in the literature review inadvertently provided some of the conditions of a natural experiment.^{7,8}

Those that contributed written and/or oral evidence (contributors) felt that the impact of consultant-delivered care on outcomes could be categorised in various ways:

- **Early consultant assessment** and intervention ensures that the patient starts earlier on the right pathway of care with opportunity for improved outcomes. In emergency and acute medical care settings this has the potential for immediate dramatic differences in outcome. There is limited statistical data from English hospitals that suggests that the presence of emergency medicine consultants in the Emergency Department may reduce hospital admissions from between 12 and 25%.²² NCEPOD reports over two decades link the outcomes of emergency admissions to the assessment and management of acutely ill patients by seniority of clinicians²³
- **Advanced clinical skills achieving better outcomes** and being better placed to manage uncertainty and to respond when there are unexpected complications or unusual circumstances. Hospitals have demonstrated improved outcomes on medical acute admissions units, with reductions in unnecessary admissions, length of stay and readmissions after the introduction of additional consultant ward rounds in the evenings and weekends
- **Reduced patient safety errors.** Whilst patient safety errors occur with all groups of doctors there is evidence that the risk is greater in some areas with doctors in training for example in prescribing errors²⁴
- **Consultant presence.** The recent report from NHS London¹¹ provides strong evidence on the differing mortality rates depending on weekday/ weekend consultant presence. The Royal College of Paediatrics and Child Health (RCPCH) reported a study of infant deaths which found that babies born outside the hours of 9am to 5pm, Monday to Friday, were more at risk of dying and that a lack of immediate access to senior staff at weekends contributed to this outcome.²⁶

2.3 More efficient use of resources

Contributors considered that good consultant-delivered care should lead to the most effective and productive performance and hence the most efficient use of resources.

Contributors' examples of this included:

- **Productivity**

Consultant productivity is a complex issue subject to considerable variation and affected by numerous factors. Often, and erroneously, confused with “throughput”, true productivity encompasses quality, value and effectiveness within a whole system. However, contributors' responses indicated that experienced consultants are able to achieve greater throughput than doctors in training whether in clinics or theatre. Experience in independent Sector Treatment Centres (ISTC) and the private sector where throughput is not reduced by the inevitable, and rightful, requirements of teaching and training show the scope for consultant productivity.

It was stated that there is evidence from primary care that use of GPs may in many instances be more productive than use of nurse consultants.

- **Reducing the length of stay**

Length of stay is reduced if patients are reviewed by a consultant with discharge planning started early in admission process.

Consultant-led hyper-acute stroke models in Manchester and London have resulted in higher quality care and shorter lengths of stay. In London 40% of these admissions go home within three days which is half the length of stay rate in England as a whole²⁷

- **More effective use of diagnostics and investigations**

Consultants' experience tends to make them less likely to require a full range of diagnostic tests or interventions and minimise the need for additional investigations.

Consultants are less likely to make errors in prescriptions and more likely to reduce unnecessary medication or manage potential drug interaction.

- **Risk and cost**

Contributors suggested that use of fully trained staff reduced the risk of claims for negligence or error. This was not possible to quantify. However, the NHS Litigation Authority's Clinical Negligence Scheme for Trusts (CNST) offers discount on the cost of premia payable by Trusts according to the level of compliance with their standards. There are specific standards relating to maternity care standards on which include standards on consultant obstetrician staffing levels and more general clinical care standards.²⁵ Whilst direct read across may not be possible, high quality consultant care and proper staffing will raise the likelihood of achieving higher financial savings.

- **Management and Leadership**

Consultants have management and leadership responsibilities in healthcare. Aside from any positional management responsibilities, all consultants have experience and training which should enable them to lead teams and make decisions in a way that doctors in training are not equipped to do.

The Academy recognises that there is wide variation in consultant behaviour and performance. It also recognises that many doctors do not have a full appreciation, often because of the inadequacy of data, of the differential resource implications of their clinical activities. However, as clinical leaders it is consultants who are best placed to ensure the most effective use of resources.

2.4 GPs' access to the opinion of a fully trained doctor

From the contributors input it was shown that GPs would prefer to access the opinions of consultants rather than junior doctors. As one GP respondent commented that, they would 'welcome greater opportunities to speak to or e-mail a consultant who directly knew the patient, and who had the authority to see the patient sooner or change their management plan as necessary.' This could facilitate better shared care across secondary and primary care.

Consultants have overall responsibility for patients and for their discharge back to the care of GPs. Consultant-delivered healthcare is therefore important in providing continuity and transfer of care.

In terms of the supply of trained doctors there is general acknowledgement that there is a need for increased numbers of GPs.

2.5 Patient expectation of access to appropriate and skilled clinicians and information

Patients want to see an expert with the knowledge and skills to address their problem and to provide them with the highest standard of care. Whilst organisations may require generalists, individual patients will want to be treated by the person with the greatest specialist knowledge of their conditions once diagnosed.

Expert consultant care should enable fuller and better information to be shared with patients and relatives. This includes reducing the scope for misinformation, lending support in shared decision making and, as a result, minimising complaints and confusion. There is evidence that consultant involvement in a patient's care can increase the patient's and the patient's family's overall satisfaction with their care.²⁸

Patient experience of care is undoubtedly enhanced by having trained and experienced doctors seeing them when they first arrive. The patient journey is potentially shortened and the clinical outcome enhanced. A recurring theme of

NCEPOD reports has been that patients benefit from access to appropriately experienced and skilled clinicians in a timely fashion.²⁹

It is perhaps worth noting that the expectation of patients in the private sector and one of its perceived benefits and advantages is that medical care will be delivered by consultants.

2.6 Benefits to training for junior doctors

Both the Collins³⁰ and Temple¹⁹ reports produced for Medical Education England on the Foundation Programme and the impact of the EU Working Times Directive on training respectively found that trainee doctors felt expected to act beyond their competence and were poorly supervised. This was corroborated by the findings of the General Medical Council's annual trainee survey. This lack of competence and supervision is not acceptable for patient safety or patient experience of care.

As it always has done, the NHS continues to rely on high levels of service delivered by doctors in training to survive. Extensive experience of delivering real clinical care is essential to the training of doctors. However, there does now seem to be recognition that over-reliance on service being directly delivered by doctors in training is not good for either the quality of care or the quality of training.

Most contributors were clear that greater consultant presence in hospitals will benefit not only services to patients but also the quality of training for junior doctors and other clinical staff. Junior doctors will have greater opportunity for learning and greater contact with consultants from whom they will learn.

The Temple Report was also clear that greater consultant presence leads to higher quality care and allows for better day time training. *“Handovers can be an effective learning experience when supervised by senior staff, preferably consultants” and that “with increased consultant presence out of hours, trainees will gain from the essential experience of working under supervision”.*¹⁹



3 ISSUES & PROBLEMS

Whilst all contributors were clear about the benefits of consultant-delivered care, they were also aware of issues and problems.

3.1 Supply and affordability

There was general recognition that the NHS had serious issues to address in terms of the number of doctors coming through training. Since 1995, the number of consultants has doubled from 18,000 to 36,000 and the number of trainee doctors has increased from 27,000 to 51,000 (Source NHS Information Centre - Medical and Dental Workforce Statistics).

The Centre for Workforce Intelligence (CfWI) has calculated that if current plans continue, there could be an increase of over 60 per cent in the fully trained hospital doctor headcount by 2020. If all eligible doctors become consultants then this could result in an estimated £6 billion spend on the consultant pay bill, an increase of over £2 billion on the 2010 figure.

Decisions about affordability are about choices and priorities. The resources freed up from fewer trainees and Trust doctors, a smaller locum agency bill and more efficient practice could contribute towards a fully consultant-delivered NHS. It could be argued that the funding of such consultant expansion is a priority for the country. However, the realities of the current economic climate and, in particular, the financial pressures on the NHS make this unlikely.

As was stated at the outset, this project is categorically not about the pay and contractual conditions of consultants. Nor is it about overall affordability. The focus is the outcome, quality and productivity of consultant-delivered care with the emphasis on the service that patients should rightfully expect.

Decisions about the use of fully trained doctors must take into consideration all the issues around quality, performance and productivity raised in the previous chapter and not simply be made on financial considerations based on the current contractual arrangements.

In current financial circumstances, this may mean that there have to be discussions about the future consultant contract and the shape of the consultant career. The detail of contractual issues is not the province of the Academy or the Medical Royal Colleges.

However, if resources are simply not available to employ the numbers of doctors coming through training on the current consultant terms there would seem to be several possible scenarios. These are:

- **Unemployment**
All doctors in training would progress to CCT. Consultant numbers and remuneration remains broadly unchanged. Therefore a significant proportion of doctors would simply not find jobs as consultants in the NHS and have to find jobs elsewhere. This would seem an appalling waste of taxpayer investment and be grossly unfair to doctors currently in training.
- **Diversion**
A proportion of doctors in training would be diverted away from CCT into some form of non-consultant specialist post. This would retain medical resource in the NHS but fail to utilise the benefits of fully trained delivered medical care. It would obviously not be popular with doctors in training.
- **Contractual change for new consultants**
All doctors in training would continue to get their CCT and be employed as consultants with the right to independent practice. However the contractual arrangements in terms of financial expectations and progression arrangements would be different with some layering of the consultant career. This would not be attractive to all doctors currently in training but, importantly, would allow the benefits of consultant-delivered care to be retained.
- **Limiting supply**
Progress through training could be slowed and inflow from medical schools could be reduced. This is not an immediate solution and would lose the opportunity for realising the benefits to quality of consultant delivered care through increased numbers.

3.2 Reshaping consultant working practices

If consultant-delivered care does produce better outcomes for patients it cannot be acceptable that this only available for some patients and only at some periods during the day or week. Achieving the benefits for patients of consultant-delivered care therefore requires greater consultant presence in hospitals than at present. This does not mean 24 hour full consultant attendance across all specialties. However, it will generally require consultant presence on a 7 day basis for 12+ hours a day. Whilst such work patterns are already usual in some specialties they are not the norm across all specialties.^{31,32,33}

If, however, as the recent NHS London¹¹ report suggests over 500 additional people may die per year because of the differential consultant staffing in London hospitals at weekends the case for change is overwhelming. Equally the Temple Report was clear in its recommendation of the need to move to a consultant-delivered service.

The Academy recognises that delivering a meaningful consultant-delivered service requires cultural as well as changes to traditional models of service delivery.

It is also essential that increasing consultant presence must not threaten the needs of clinical academics; in particular, their research and academic sessions must be protected. Similarly all trainers and educational supervisors must have adequate time in their job plans allotted for their teaching commitment.

The service also needs to benefit from the management and leadership skills of consultants. It is important that increasing time spent by consultants in out of hours service does not preclude their attendance at weekday meetings in which discussions are held on the future shape of local or national services.

3.3 Reshaping the consultant career

The changes to working patterns required for a system of consultant-delivered care and any contractual change that may be required to accommodate the number of doctors currently in training mean that there has to be a serious examination of the overall shape of consultant careers.

Reasonable expectations around “out-of-conventional-hours” working for consultants at the start of their career may not be reasonable or sensible for older consultants coming towards the end of their careers or appropriate for other consultants with different roles or responsibilities.

Providing a full consultant-delivered care service will involve changes for many consultants which may not all be appealing on a personal level. It is important, therefore, that the consultant career as a whole is structured and balanced in such a way that it will continue to satisfy and attract.

Whilst progression arrangements may not be the same in the future and competitive entry to more senior positions may be required, no doctor who has obtained their CCT following many years of undergraduate and postgraduate training should be a sub-anything. The term consultant is valued by doctors in recognition of the skills they have attained and the training they have completed. The Academy believes that these doctors deserve to retain the right to be known as consultants.



4 CONCLUSIONS & RECOMMENDATIONS

It was recognised at the outset that the review of the literature and the outcomes of the Academy study would be unlikely to identify any randomised trials comparing outcomes of care delivered by consultants versus doctors in training. This proved to be the case. For ethical reasons it is unlikely that there will ever be such a study.

However, with over 70 individual pieces of evidence cited in the literature review, a great number of which are from 2008-2011, the Academy believes that this is the most comprehensive and focused reference source available on this topic.

In summary

- Numerous reviews by expert clinicians have concluded that patients have increased morbidity and mortality when there is a delay in the involvement in their care of consultants across a wide range of fields including in acute medicine and acute surgery,¹ emergency medicine,² trauma,³ anaesthetics⁴ and obstetrics^{5,6}
- Data from the trainee doctors' strike in New Zealand demonstrated consultant care during the strike was associated with faster patient processing⁷ and decreased hospital stay⁸
- The increased mortality among patients treated in hospitals at weekends has been attributed by expert clinicians to decreased consultant involvement in care^{9,10,11}
- Studies designed to improve patient care which have incorporated earlier involvement of consultants have resulted in better patient outcomes, more efficient use of beds and decreased length of stay.^{12,13,14,15,16} In intensive care similar measures have resulted in better triage and decreased futile care.^{17,18}

Overall, the literature shows that there is considerable internationally shared professional knowledge, expert opinion and some secondary evidence on the quality of care delivered by trained secondary care doctors which should contribute to decisions about the shape of the medical workforce.

Taking what was received in submissions with the international research there is evidence across a wide range of medical fields that consultants deliver better patient outcomes and improved efficiency of care. While this is not based on Level 1 evidence, the consistency of the association between consultant involvement and improved outcomes across many studies in many specialties is compelling.

From the oral and written evidence received during stage 1 and 2 of the project, alongside the literature review in Part 2 of this report, the Academy concludes and recommends:

- **Consultant-delivered care has benefits in terms of:**
 - o **Rapid and appropriate decision making**
 - o **Improved outcomes**
 - o **More efficient use of resources**
 - o **GP's access to the opinion of a fully trained doctor**
 - o **Patient expectation of access to appropriate and skilled clinicians and information**
 - o **Benefits for the training of junior doctors.**
- **These benefits need to be fully taken into account alongside cost implications when considering the future shape of the medical workforce at local or national level**
- **Seeing the increased numbers of doctors coming out of training through a purely financial lens would be a significantly missed opportunity to improve the quality of care**
- **Current contractual arrangements for consultants need to be separated from the question of the benefits of consultant-delivered care**
- **The benefits of consultant-delivered care should be available to all patients throughout the whole day and the whole week**
- **Implementing a full system of consultant-delivered care will require different thinking about consultant working patterns**
- **Accommodating changes to consultant working patterns and possible contractual changes requires a corresponding review of the overall shape of consultant careers**
- **Work should be undertaken between clinicians and employers to map out the staffing requirements and service implications of implementing a consultant-delivered service throughout the week.**
- **The term 'consultant' is important to patients and doctors and should be retained.**

"In matters of style swim with the current; In matters of principle, stand like a rock."

Thomas Jefferson

PART 2

CONSULTANT-DELIVERED CARE:
A REVIEW OF THE LITERATURE AND SUPPORTING
EVIDENCE ON THE QUALITY OF CARE DELIVERED
BY TRAINED SPECIALISTS AND POST-GRADUATE
DOCTORS IN TRAINING.

COMMISSIONED BY THE ACADEMY
OF MEDICAL ROYAL COLLEGES

DR J CURSON
DR CM BARRETT



ABSTRACT

Background:

Planned reduction in the number of specialty training posts, implementation of European Working Time Directive (EWTD) and current political and economic influences on healthcare delivery including a significant productivity challenge, are driving changes in role of consultants in medical care delivery. This literature search was commissioned by the Academy of Medical Royal Colleges (the Academy). There is a need for evidence about the benefits or otherwise of consultant-delivered care in ensuring quality of future patient care and to inform debate about the balance between ‘trained’ specialists and ‘in-training’ doctors.

Objective:

To search and review the literature and supporting evidence on the quality of care delivered directly by trained specialists compared with care delivered by post-graduate doctors in specialty training under the direct or indirect supervision of consultants.

Search Strategy:

Standard electronic searches (i.e. MEDLINE, EMBASE, HealthSTAR, AMI/Informat Health collection, Scott’s medical database, Google Scholar, PubMed, EThOS, GreySource) were undertaken of published evidence and grey literature Expert opinion was obtained via the Academy.

Selection criteria:

Standard identification by key words and retrieval and selection methods were applied to UK and international papers, written in English (1991-2011).

Results:

No major research projects (multi-site, funded, international or randomised controlled trials, comparative or evaluative studies of the target populations) were identified. Considerable secondary evidence and expert opinion on the quality of care delivered by trained specialists and post-graduate doctors in training was identified. The Academy²⁰) provides evidence of increased quality of care directly supervised by consultants. Two studies of the New Zealand resident doctors’ strike^{7,8} provide some insight into the “real world” scenario of consultant-delivered care. Three comparative studies of trained specialists versus post-graduate doctors in training^{15,16,12} demonstrated improved care outcomes by consultants. However, two of these were single-centre projects. The benefits of consultant-led units; effect of increase in consultant numbers and the introduction of hospitalists in the USA were identified in many recent studies and national audits. Exemplars are identified which may suggest that consultant-delivered care produces better outcomes.

Conclusion:

There is limited evidence to allow comparison of the quality of care delivered by trained specialists versus post graduate doctors in training. There is internationally shared professional knowledge, expert opinion and considerable secondary evidence to support decision-making with regard to future policy making on consultant-delivered care.

Keywords

Consultant-delivered, doctors in training, specialists and quality care



1. INTRODUCTION

In the UK there may be, in the future, an excess in some specialties of post-graduate doctors who have completed their training and are seeking consultant posts. There has been a fall in NHS consultant vacancy rates for all specialties; from 4.7% in 2003 to 0.9% in 2009.³⁴ The European Working Time Directive was introduced in 2004 and remains a major influence on consultant workload in the UK.^{35,36,37,38,19,40} Junior doctors do work fewer hours now and this has changed the balance of medical care delivery. Professional demands for change have intensified due to the imbalance between numbers of doctors in training and the total needed to fill potential consultant posts in some specialties. In addition, there is too often a dependency on doctors in training to provide services, particularly at weekends.¹¹ A multiplicity of factors have combined to create this complex situation and to resolve them will require consideration of challenging issues such as appropriate distribution of consultant work, level of competence required and quality of care delivery.

There is a need for evidence of the benefits of consultant presence in ensuring quality of patient care. With lessening economic resources in healthcare this suggests a need for alternative models of service delivery and speciality training to be developed. The NHS requires workforce planning that accounts for policy and financial limitations to avoid putting patient care at risk.^{41,42} The Department of Health's use of workforce models created by Workforce Review Team (WRT) improved central planning for medicine and the establishment of the Centre for Workforce Intelligence (CfWI) will continue to provide information and guidance to inform debates on issues such as productivity.⁴²

The role of consultants is one aspect which will need to alter in the near future. The NHS Plan's⁴³ section on "proposed changes for doctors" identified a 30% expansion in consultant numbers by 2004 and a significant increase in centrally funded specialist registrar numbers. It offered two options for senior doctors that polarised opinion; expansion of non-consultant career grade doctors and consultant-delivered services.

The latter option was stated to be ideal but not achievable within a decade in emergency medicine.⁴⁴ Continued support for focused consultant expansion and consultant-based care has been confirmed more recently by the profession to be an absolute necessity.⁴⁵ There is continuing evidence of increasing involvement of consultants in the management of patients, a demonstration of a consultant-delivered service.⁴⁶ Several important questions still need to be addressed in order to determine workforce requirements for consultants and junior doctors in the future NHS, for example:

- What is the current evidence-base of consultant practice?
- What are the costs and cost-effectiveness of consultant-led care schemes?
- What research findings support proposed models of delivery?

Consultant supervision of care is widely hypothesised to improve patient experience. However, this view is not currently supported by true experimental evidence.²³ Even evidence of the benefit of having more senior medical staff on

a unit is hard to find in the literature.⁴⁷ However, the Medical Workforce Project²⁰ does identify the added value doctors bring to the healthcare team and the mounting evidence that improved patient outcomes result from consultant supervision of care. Differing terminology is adopted in the debate on the role of consultants and includes: consultant-delivered care, consultant-led care/units, consultant-based care/service and consultant managed care. Attempts at typology may be an academic distraction to informed, productive debate that improves care services as, in reality; consultants could successfully adopt various work practices to suit the many different clinical situations in which care is delivered.

The Royal College of Physicians' (RCP) key recommendations for consultant working³¹ were audited in a recent on-line survey.⁴⁸ It was completed by 27/39 Trusts in England and Wales, 26 of which had consultant-led acute medical units. Consultant activity varied but "consultant of the day" was the most common pattern of work. A lack of standardisation with regard to twice daily consultant review of care was also highlighted in this audit. RCP⁴⁹ reported a further audit that revealed that consultant working patterns still reflected no change and "Consultant of several days" has been implemented in few Trusts and there is lack of Acute Physician input at weekends. Royal College of Paediatrics and Child Health (RCPCH)³³ service standards identify good practice as a Paediatric Consultant (or equivalent) presence during peak times of activity and "Consultant of the Week" in general paediatric in-patient units.

The type of work done by consultants is changing the balance between "trained" and "untrained". The 2009 Census of consultant physicians and medical registrars in the UK identified that 58% of consultants were doing work previously done by junior doctors.⁵⁰ Decisions about future consultant activity requires an informed debate about the balance between "trained" and "in-training" doctors based on sound empirical evidence. Post-graduate doctors in training could be assumed to be medical staff still being supervised and professionally assessed. The difficulty comes in differentiating the scope of responsibility and authority in practice of consultants and non-consultant senior doctors. The Deaneries monitor trainee numbers and progression but the data on non-consultant career grades on ESR has large disparities.⁴²

The Deaneries hold data on trainee numbers. The role of individual senior doctors may involve all or some of the following; hands-on clinical work, teaching and supervision, team leadership and service management, education and training, research. However, some UK doctors who hold a certificate of completion of training (CCT) are employed in non-consultant posts e.g. locum consultant, resident-on-call and post-CCT fellows.⁵¹ An opinion expressed recently in BMJ Careers is that the new hybrid consultants have come into existence for various reasons, one of which is the move towards consultant-delivered care as opposed to consultant-led care.⁵²

This literature search, commissioned by the Academy of Medical Royal Colleges, focused on the evidence of the quality of care delivered by trained specialists compared with post-graduate doctors in training (shortened to "doctors in training" in this paper).

2. METHOD

Electronic searches were made of UK, American, Australian and New Zealand medical databases and relevant professional bodies and organisations (Appendix 2). Hand searches were carried out and secondary references obtained from identified literature

Terminology used in practice and literature to describe doctors varies and different terms are used internationally for similar roles to those in the UK. There is a lack of clarity about consultants' current clinical roles, varying scope of responsibility and place within service delivery patterns. For the purposes of this search terminology was clarified taking into account international variations (Appendix 3) and use of the terms "consultant" and "post graduate doctors in training" and "consultant-delivered care" were agreed and adopted.

Standard retrieval and selection methods were applied to UK and international journal papers, reports and guidelines written in English, 1991-2011. Key words were identified (Appendix 4) and these were combined and subjected to MeSH and Boolean and (s) applied.

In response to the Academy's call for expert opinion 2011, evidence was received from Royal Colleges, Professional Bodies, Organisations and individuals (Appendix 5).



3. RESULTS

This focused literature search and supporting evidence from professional bodies and healthcare related organisations failed to identify any major research projects (multi-site, funded, international or randomised controlled trials, comparative or evaluative studies) on the quality and nature of care currently delivered by consultants versus that provided by doctors in training. Some studies and national audits of consultant- delivered care were identified, although there were many variables which negated interpretation and comparison of results. An important confounding issue is that reports of service initiatives which involve consultants often include multi-disciplinary team formation and intervention by one or more non-medical “consultants” but these are not monitored as variables.

There is rarely a control for such factors and indeed this may prove difficult in practice. Considerable secondary evidence and expert opinion on the quality of care delivered by trained specialists and post-graduate doctors in training was identified in this focused search. The sources of evidence are mainly single site studies in UK, New Zealand, Australia and USA and expert opinion from the Royal Medical Colleges in the UK. Two studies of the New Zealand resident doctors’ strike^{7,8} did provide some insight into the “real world” scenario of care.

The evidence identified was retrieved and subject to analysis which enabled evidence grouping in the following sections:

- Evidence of improved consultant care outcomes in strike conditions
- Evidence of improved care management by consultants in normal working practice i.e. non-strike conditions
 - o Comparative studies of trained specialists versus doctors in training
 - o Other evidence indicating the benefits of care
- Evidence that consultant-delivered care may not be better than that delivered by doctors in training
- Evidence that care by doctors in training is less efficient than consultant-delivered care
- Studies providing evidence that consultants and middle grade trainees appear equally effective.

3.1 Evidence of improved consultant care outcomes in strike conditions

Following the five day resident doctors’ strike action in New Zealand in 2006 two studies were published that cast light on specialist input into patient care in teaching hospitals.^{7,8} Emergency departments within Australasia are staffed with consultant-supervised resident doctors in training but during the strike experienced consultant physicians delivered care in addition to their normal duties. The strike in New Zealand created a situation in which the balance between “trained” and “in-training” doctors was altered. This was a useful research scenario but in a “real world” setting with many variables and few controls. For example, only about 80% of the junior doctors complied with the

industrial action,⁸ elective admissions and operations were cancelled and research and teaching curtailed⁷ and the effect of other service initiatives such as increased use of nursing and allied health professional “consultants” was not measured.

Harvey *et al.*⁷ reported a prospective observational study of 1,291 patient presentations, in a 650 bed hospital. Observation during non-strike time was the two weeks following the end of the strike. SPSS analysis of 608 strike period presentations and 683 non-strike presentations demonstrated a correlation between increased senior physician seniority and patient waiting times, disposition time and length of stay but no difference in patient walkout, 48-hr mortality or 30-day unscheduled representation rates. There was increased efficiency overall in patient processing Whilst the researchers admit the potential confounders in a “real world” study, particularly the effect of a “strike culture” producing heightened awareness for expedient patient care the study produced statistically significant evidence of faster patient processing which correlated with physician seniority During the non-strike period there was a normal staff complement and a daily average of 111.2 hours was provided medical staff (total hours: consultant 216, registrar 323, SHO 75). In contrast during the strike a daily average of 98.6 hours (total hours: consultant 359, Career Medical Officer 20, Registrar 114). With regard to potential bias senior nursing staff carried out triage in both periods but an important confounding variable was a reduction in absolute bed availability during the strike. This study showed no significant difference in patient mortality.

Robinson *et al.*⁸ provided further insight into emergency services and included internal medicine in another single site study of a large tertiary hospital. A retrospective assessment of the emergency department revealed waiting times and length of stay in the department were markedly reduced compared with the previous two months and consultants were able to make quicker decisions. Within Internal medicine, comprising a short stay unit (SSU) and a general medical ward, the proportion of patients admitted to SSU increased and the average length of stay in SSU was reduced. Total hours worked during the strike by junior and senior doctors was 210 and 288 hours respectively. By contrast the standard hours worked under non-strike conditions would have been 560 and 151 respectively During the strike a consultant was estimated, by the researchers, to cover the workload of 2.6 junior doctors and in Internal medicine of 3.0 junior doctors. The claim that consultants showed considerably increased productivity is balanced by an acknowledgement that in non-strike conditions there is a requirement for trainee supervision and formal training. However, the proportion of patients admitted did increase during the strike.

3.2 Evidence of improved care management by consultants in normal working practice i.e. non-strike conditions

The evidence in this section confirms the quality of care delivered or managed by consultants. Consultants could be assumed to have seniority and greater knowledge and experience than post graduate doctors in training and could realistically be expected to demonstrate improved care management.

3.2.1 Comparative studies of trained specialists versus post-graduate doctors in training

Two single-centre comparative research projects demonstrate the beneficial outcomes of consultant-delivered care. White *et al.*¹⁵ study of an Emergency care department in a Scottish teaching hospital with 24hr senior cover reviewed the initial assessment of 556 patients made by a junior doctor (FY2 or ST1/2) over a six month period in 2008. The aim was to assess the influence and effect of “real-time” senior clinician supervision on patient disposition. The senior cover was provided by six consultants, one associate specialist and nine middle grade doctors. Senior doctors were reported to have changed the primary outcome plan in 155 patients (28%). The accuracy of decisions was improved and re-admissions reduced, inappropriate discharge was prevented and outpatient appointments were judged to be more appropriately managed benefiting departmental flow and patient safety. This is one of many studies comparing care given by junior doctors with that delivered by senior staff. However, it appears to have been a missed opportunity to differentiate between consultant, associate specialist and middle-grade doctor performance, as 501 patients were assessed by senior doctors alone.

This was achieved in a second study by Sen *et al.*¹⁶ This was a retrospectively analysis of the 2009 activity of the emergency department in the District General Hospital in Wrexham, UK. In this hospital consultant “hands-on” care is stated to have been in place since 1996 and consultant based service delivery since 2003. In the department there are five consultants, one specialist registrar, seven Staff Associate Specialists and eight junior doctors. Consultants often saw more patients than SHOs or middle grade doctors; they admitted fewer patients, had fewer leave without treatment and discharged more outright. They had a faster turn-around time for every triage category and referred fewer patients to clinic. These are all clinically significant outcomes and starkly demonstrate efficiency of the consultants’ service delivery. Consultants outperformed middle grades in care of the critical patient (major trauma, airway compromise, sepsis etc.¹⁶

A study in four Scottish Teaching hospitals¹² showed an association between seniority of Accident and Emergency doctors and patient outcomes following trauma. A comparison of actual patient survival for five years was retrospectively compared with predicted survival on Trauma Score-Injury Severity Score (TRISS). The group of consultant treated patients had a significantly better outcome. Junior doctors showed step-wise improvement, in treating patients, with seniority.

3.2.2 Other evidence indicating the benefits of consultant-delivered care

Evidence is available from many specialities of the benefits of consultant-led units, effect of increase in consultant numbers and the introduction of hospitalists in the USA. The examples which are provided in this section do not directly compare specialist consultant-delivered care with that provided by in-training doctors but provide evidence of the benefits of consultant care for a variety of outcomes; clinical, patient satisfaction, safety-related, service delivery etc. In addition, the BMA’s Promoting Consultant Expansion across the NHS⁵³ presents some considerable expert opinion from the Medical Royal Colleges and some

specialty-based evidence. The Medical Workforce Project²⁰ is a useful source of evidence (2002-2008) improved patient outcomes result from consultant supervision of care and the efficiency of care of doctors trained to CCT level. In particular Appendix 5 in that report provides further examples from many specialities of the clinical value of trained specialists.

An Australian study of paediatric emergency services in a tertiary hospital serving a population of two million⁴⁷ demonstrated the positive impact of an increased number of emergency consultants. Retrospective analysis of routinely collected computerised data (1997-2006) was completed for numbers of children admitted, reported complaints, average waiting times and consultant numbers. An increase in the number of consultants, 2000-2004, correlated with improvements in all other parameters. Evaluation of net costs of service delivery in this period, using the total health price index, demonstrated the initiative to increase consultants to be cost effective. Other variables, such as other staffing numbers and number of children presenting remained essentially unchanged.

The authors were cautious about unequivocally linking outcomes with increased consultant numbers without a prospective randomised trial comparing two departments. However, they were clear that other benefits were apparent as well including the ability of junior staff to contact consultants out of hours, increased “on the floor” supervision and the development of clinical initiatives. In the UK the Temple Report¹⁹ states that the expansion of consultant presence can result in efficiency savings and enhanced patient safety but fails to cite evidence to support these statements. In New Zealand a “Business case” developed to sustain the Senior Medical and Dental workforce suggests that with improved clinical leadership and supervision the patterns of requesting of diagnostic tests by resident doctors could easily be reduced by 5-10%.⁵⁴

There would appear to be considerable evidence of consultant practice in obstetrics and gynaecology having an effect on reducing maternal mortality in 10 years reporting of CESDI enquires,^{5,6} specifically timely referral to consultants of women who have, or are developing, a critical illness. Part of this evidence relates to problems of poor CTG readings and higher mortality out of hours and deaths due to pre-eclampsia or sepsis because the doctor in training did not appreciate the severity of the situation. The Medical Workforce Project²⁰ cites CESDI results in evidence of the benefits of consultant involvement in acute work. The independent review of serious untoward incidents within Northwick Park maternity services⁵⁵ revealed that in six out of the ten maternal deaths there was no consultant input. The presumption that adverse incidents may be prevented by consultant presence alone is challenged by consideration of the complex realities of care delivery. For example The Kings Fund report on The Safety of Maternity Services in England⁵⁶ summarised evidence on the numerous factors influencing maternal/baby mortality and morbidity and recommendations for consultant presence or involvement.

It concluded that there had been no systematic audit or evaluation to assess implementation of recommendations. However, it should be acknowledged that the more recent Kings Fund report Staffing in Maternity Units⁵⁷ suggested new staffing models, task-shifting and midwife-led care. Its recommendations were based on an assertion that the EWTD and restructuring of the postgraduate

medical training programme will make speciality-specific 24 hour cover difficult coupled with less experienced specialist consultants, working shorter hours. It stated that “there is an absence of evidence about whether an increased consultant presence contributes to safety” despite calls for increased consultant presence in delivery suites. This was based on a scoping review of published and unpublished literature (1993-2009) and key stakeholder consultation. There have been studies comparing care delivered by midwives and nurse practitioners and general practitioners^{58,59} and midwives and paediatric senior house officers,⁶⁰ but no studies were identified comparing consultants versus doctors in training in maternity care delivery.

The RCOG continue to issue clear guidelines outlining the responsibility of Consultant on-Call.⁶¹ Currently all consultant-led maternity units in the UK participate in reporting to UKOSS, a surveillance system for recording near-miss maternal morbidities and rare disorders of pregnancy and these clinical events have been monitored by a similar methodology since 2003 in Scottish consultant-led units. Maternal death was lower in women in the UK, 2006-2008, who received consultant-led antenatal care than in women who experienced all other forms of antenatal care.⁶ Better medical decision-making, less operative mortality and lower rates of caesarean section have been attributed to consultant presence in obstetric care.^{62,63}

In the North West of England a survey was undertaken to evaluate the introduction of consultant posts to deliver resident emergency shifts (CYPF NHS 2010). Thirty nine consultants were interviewed in 2009/10. Overall the posts were reported to have had a positive net effect on the quality of service provided, patient safety and training of junior staff. The final report states that NW Deanery will be undertaking funded questionnaire evaluations of the resident consultant posts.

There is further robust evidence of the benefits of consultant-delivered care which is presented chronologically in this section. A study in Suffolk, UK involving 2,064 patients²³ showed consultant presence in an acute medical unit, over eight months to be effective, especially for short stay patients. When the unit opened there was consultant presence on some weekdays only. When there was a consultant present the length of stay was significantly lower as were inappropriate admissions i.e. more patients were discharged post-assessment without an effect on mortality or re-admission. Hanousek *et al.*⁶⁵ retrospective survey of outcome after day surgery in a District General Hospital (1996-2006) excluded those patients who had a local anaesthetic. The admission rate of patients after day surgery was lowest when care was delivered by Consultant Anaesthetists and highest when delivered by trainees.

The College of Emergency Medicine’s (CEM) survey⁶⁶ and workforce recommendation report for emergency medicine consultants²² cite some evidence of the improved clinical care and cost efficiencies associated with consultant led care and clinical decision-units in England but the statistical data is limited. The largest UK-wide study of women with acute fatty liver of pregnancy reported better maternal and neonatal outcomes than previously reported. All women suffering from this severe condition are delivered in consultant-led, hospital based maternity units in 229 hospitals. The population based descriptive

study involved fifty-seven pregnant women.⁶⁷ Patients undergoing major vascular surgery, a high risk group for morbidity and mortality, were shown to benefit from consultant anaesthetist pre-operative assessment clinics.²⁸ The population of 234 patients was from a particularly poor socio-economic background but patient outcomes from the consultant clinic compared favourably with the national average, including improvement in mortality rate post infra-renal aneurysm repair. A follow-up survey of 80 patients identified 98% were highly satisfied with this service. In addition, an improvement in waiting times and decreased blocks to access, due to consultant emergency physician presence, was demonstrated in an Australian regional hospital.⁶⁸

This retrospective study of a large patient population (11,999 patients) considered a six month period when there was incomplete emergency physician cover i.e. for 76.5% of the presentations. Consultant performance was measured against Australian Healthcare Standards. All indicators showed a trend towards improvement when there was consultant presence. The authors acknowledge that significant difference against some indicators may have been partially attributable to improvements in triage and that overall the effect of consultant input was “small”. This illustrates the complexity of practice and lack of control for variables and the need for tightly controlled studies.

Terris *et al.*⁶⁹ demonstrated the effectiveness of involvement of senior clinicians in initial patient assessment in the emergency department, a situation which was uncommon in the UK at the time. There was a dramatic overall reduction in the numbers of patients waiting to be seen and many patients were effectively treated and discharged after the initial consultation. Consultant-led management of large bowel problems were reviewed in a randomised clinical trial of 1,131 patients referred by their general practitioners in Scotland.⁷⁰ Surgeons assessed the consultant-led group and the open access group underwent colonoscopy or sigmoidoscopy.

A significant trend was identified, for the consultant-led patient group, to have more investigations, although overall in this group more patients had no investigations. This could suggest that consultants were more decisive and confident in their diagnosis. The percentage of patients diagnosed with colonic or other pathologies was similar but in the consultant-led group mean standard time for diagnosis of significant pathology was shorter⁷⁰. Earlier patient discharge and increased efficiency has been demonstrated in new acute admission consultant-led units led by consultant physicians.¹³

There is some evidence from psychiatry of the benefits of consultant-delivered care. An Australian prospective study, nested within an RCT, considered three interventions which aimed to improve the post-discharge care provided by GPs to patients admitted to hospital with cardiac problems who were found to have depression.⁷¹ The study considered three interventions: an educational pack for GPs on depression and cardiac problems, a multi-disciplinary telephone conference with the GP, and one-to-one telephone advice from a Consultant Psychiatrist to the GP. However, only the telephone advice session was found to be a statistically significant means of reducing the proportion of patients with moderate to severe depression when compared with usual care, as well as being the most practically feasible to deliver. An earlier retrospective study in

the USA examined diagnosis and treatment of outpatient insomnia by internists, surgeons and psychiatrists.⁷² Although this was in one service setting (US Veteran Affairs Medical Centre) it retrospectively analysed 555 prescriptions and 536 patient records. A statistically significant relationship existed only between the Psychiatrist and symptom documentation and 74% of their records referred to the patient's sleep patterns compared to only 12% of the Internist's records.

Finally, there is a large body of literature from the USA on the effect of the introduction of senior specialists, known as 'hospitalists', who were introduced in North America. The studies provide considerable evidence of enhanced efficiency in patient care.^{73,74,75} An illuminating study is Tenner *et al.*⁷⁶ two year retrospective cohort study measured length of stay and survival of children in paediatric intensive care units in two hospitals managed by a group of Paediatric consultants One hospital introduced hospitalists and one retained a traditional resident staffing model allowing comparison of patient outcomes when the balance was altered within the medical staffing group. Multivariate analysis was adjusted for severity of illness in the children. Survival rate improved and length of stay was shorter in the hospitalist group. The authors conclude that "the quality of care of critically ill patients is improved when experienced physicians are providing bedside care".

3.3 Evidence that consultant-delivered care may not be better than care by doctors in training

Very little research evidence was identified in this section and some which was identified had marked methodological weaknesses. However some indirect evidence of quality of consultant care is provided in the response of National Clinical Assessment Service (NCAS)⁷⁷ to the Academy survey.

NCAS data reveals that a minority of senior doctors may be less competent than younger doctors in that NCAS deals with 1/200 registered doctors where performance is a concern and these referrals rise with age. This may emphasise the challenge of keeping up-to-date and could suggest a reshaping of the senior medical career is required. Alternatively, many referrals to NCAS relate to problems of communication and teamwork, rather than technical competence and it may be these deficiencies that come to the fore in more senior roles. NCAS⁷⁸ presents an analysis of eight years' case data which have been subsequently subject to descriptive statistical analysis and regression modelling. Further monitoring work has been recently published and includes analysis of 5,595 cases.⁷⁹ The likelihood of referral of doctors beyond age 60 is about 7 times the likelihood below age 40. GMC data similarly shows that referral of doctors is over-represented in the groups 20-40 years after the primary medical qualification is obtained. In 2010 the top three types of concerns leading to referral to the GMC were about clinical investigations or treatment; respect for patients; and communication with patients.⁸⁰

A published systematic literature review (1966-2004) supposedly produced evidence of an inverse relationship between the number of years a physician had been in practice and the quality of care delivered, contradicting espoused

belief that experienced consultants would deliver higher quality care.⁸¹ However, this study was soundly and widely criticised for being technically flawed, non-systematic and biased.^{82,83}

Two studies of Consultant Intensivists in the UK which sought to review the effect of the NCEPOD recommendation that all new admissions should be reviewed by an Intensivist within 12 hours conclude that patient outcomes may be influenced by many factors. Both were small studies on single sites. Dharampai⁸⁴ (2010) analysed 116 new critical care patients who were either assessed within 12 hours by the Intensivist (early group) or reviewed after 12 hours (late group). The early group had a length of stay of 46 hours and mortality of 17% (n=9) and for the late group 16.5 hours and 1.6% (n=63). The difference between the groups for length of stay was not statistically significant and the early group had significantly higher mortality. Again these inconclusive results do not add considerably to the evidence of benefits of consultant care because the patient numbers were small and the author reports there was a significantly higher severity of illness in the early review group. Mullen et al.²⁷ retrospectively reviewed 96 patients' case notes, assigning 79 (82%) to the early group and 17 (18%) to the late group. The length of stay for the early group was statistically shorter and in this instance there was no significant proportional difference in mortality between the groups.

3.4 Evidence that care by doctors in training doctors is less efficient than consultant-delivered care

Few recent studies provide comparative evidence of the work practices of consultants and doctors in training work practices. The most convincing evidence is based on out of hours activity, particularly the weekend service delivery. In addition, numerous reviews have demonstrated that patients have increased morbidity and mortality when there is a delay in involving a consultant in their care.^{5,6,4,3,2,1} This is across a range of specialities and clinical situations including obstetrics, emergency admissions, death in acute hospitals, peri-operative deaths and trauma.

The outcomes of one postal survey, a self-reported view of practice⁸⁵ determined the attitudes of paediatric trainees and consultants towards immediate care of babies (born 22-24 weeks gestation). One middle-grade trainee and one consultant were approached in 63 UK neonatal units. There was a 90% survey response rate (54 consultants, 57 trainees). 83% of the trainee respondents had between 2-5 years neonatal experience. Overall consultants indicated more shared decision-making with parents, were more likely to attend 22 week deliveries and to accept requests from parents for resuscitation. Ordinal logistic regression showed significant association of increased quality of care with consultant age and experience.

A recent study by Zalkin et al.⁸⁶ sought the opinion of paediatric registrars in London on the difficulties surrounding child protection. 600 were sent a questionnaire survey and 17 attended focus groups. The survey response was poor (34%) but overall the study highlighted that registrars felt isolated, poorly supervised and unsupported in this area and consequently lacked confidence and competence to undertake this challenging area of work. A paediatric study

of acute admissions in one UK District General Hospital⁸⁷ focused on assessment of patients by consultants and middle grade trainees. 512 case notes were retrospectively reviewed to establish the number of children kept in overnight, discharged the same day and readmitted after same day discharge. No reported adverse events were associated with the assessment process. Children were admitted to the ward and then assessed by either a consultant or trainee and this was a random process depending on availability of either doctor. Assessing the need for admission resulted in 20% of all admissions (40% of those reviewed) being discharged home the same day. Unfortunately, although the authors claimed this evidence proved the benefits of consultant-delivered care but did not differentiate between consultant and trainee performance in the results within the limited published details of this audit.

Audits of surgical mortality^{46,88,89} have demonstrated that the presence of the consultant surgeon is important. In 2008 in Scotland the consultant surgeon was present in theatre in 83% of cases and of the larger volume specialities there was a lower rate of consultant presence in orthopaedic surgery (67%). Retrospective analysis of areas of concern (ACONs) during 2007-2008 showed that in eight operations the surgeon was considered too junior and 13 instances of delays to surgery/diagnostic problems were related to seniority of the surgeon.

Semmens et al.⁸⁹ analysed the audit data for 876 patient deaths, in relation to 194 surgeons whose patient had died under their care between January 2002 and June 2004. This study in Western Australia identified that the primary surgeon was a consultant in less than 50% of surgical procedures in teaching hospitals where the patient died. This proportion changed only slightly if the patient underwent second or third operation. The grade of non-consultant doctors in these operations were mainly advanced surgical trainees or service registrars (junior registrar non-training) and occasionally basic surgical trainees. The proportion of deaths associated with deficiencies of care was significantly greater where more than one operation was performed. Although the published results do not offer a comparison of patient mortality for consultant and non-consultant grades it stated the lack of full-time surgeons was one of the practical issues affecting the surgical provision.

There is evidence in cataract operations of the benefits of NHS consultant-supervision in a study by Zaidi *et al.*²⁹ Data was analysed for 1,000 patients and subgroups of 150 and 100 patients were specifically questioned on their level of satisfaction. All operations were performed or supervised by consultants. Patient satisfaction with this consultant-supervised delivery was 100%. The complication rates for supervised doctors were; Senior House Officers (2%), Fellows (4.5%) and Specialist Registrars (6.5%) Complication rates were lowest for consultants (0.1%).

This compared favourably with outcomes reported in the National Cataract Surgery Survey 1997-890 in which 7.5% of patients experienced complications during the operation and 23% had one or more complication within 48 hours. In addition, 15% of patients with no ocular comorbidity, and 35% those with serious co-existing eye disease, did not achieve 6/12 visual acuity or better. Most importantly Desai et al.'s survey of over 100 hospitals and 18,000 patients showed that having the operation performed by a senior house officer was

associated with a higher frequency of complications in the post-operative period compared with consultants' results.⁹⁰

Moreau *et al.*⁹¹ undertook a comparative funded study of the ability of junior and senior physicians, in Intensive Care Units in France, to communicate with family members. A prospective randomised trial, involving 11 units and 185 patients/families, compared the effectiveness of the ICU Residents (juniors) and ICU Physicians (seniors) to deliver honest, intelligible and effective information about critically ill patients. One family member per patient was interviewed and appraised using standard needs and anxiety tools. No significant differences were found with regard to patient/family comprehension of communication of: (1) diagnosis, prognosis, treatment, (2) satisfaction with information and care (3) presence of anxiety and depression. However significantly families who discussed care with junior doctors were more likely to feel that they had not been given enough time and/or sought additional information from their usual doctor.

Residents were not told beforehand of the trial "as this may have led them to direct more attention to information", which appears from the research report, not to have been a consideration with regard to the senior physicians. Another potential source of bias was that information provided by other care team members was not monitored. A prospective four month study of second year emergency medicine residents (USA) and 408 patient encounters revealed the need for closer supervision of patients managed initially by residents. In two-thirds of cases the plan of medical care required no change but in 4% major modifications to the plan was needed and in 33% minor modifications were required.⁹²

Lo *et al.*⁹³ conducted a retrospective review of 4,205 ENT outpatient attendees in a London teaching hospital to investigate the impact of consultants on re-attendance rates of patients. Individual consultant's practice dictated the re-attendance rates in the clinics and junior doctors had significantly lower rates in consultant-led clinics. Similarly, Lo *et al.*⁹⁴ reviewed the effect of consultant-led interactive pre-clinic case note review in an otology out-patient clinic. They found that it reduced follow-up rates by all doctor grades and the difference was statistically significant for middle grade doctors.

Concerns have been published about the level of basic understanding, of acute medical care, by newly qualified pre-registration house-officers and senior house officers as demonstrated by questionnaire testing of knowledge.^{95,96} Lack of experience, training and basic skills in assessment, diagnosis and treatment in these doctors were cited as evidence of the need for a service delivered by trained doctors.

A commonly occurring situation, which provides some evidence of the quality of care delivered by doctors in training, is when consultants are not on duty. Outside the hours of 9.00-17.00, and particularly at night, doctors in training are assessing and managing patient care in many cases. In a large survey of consultant physicians in England and Wales⁹⁷ consultants were only involved in direct delivery of medical care overnight in 6.1% of 670 teams surveyed. A recent report compiled for NHS London¹¹ in September 2011 states that annually there are more than 500 deaths in emergency care in London that are preventable and

these are due to lack of consultant cover at weekends and evenings. A self-reported survey of acute Trusts revealed service deficits against best practice indicators of acute medicine and emergency surgical care delivery. There was significant variation in consultant presence, consultant assessment of emergency surgical admissions, trainee supervision, access to theatres and patient morbidity and mortality. This review of current consultant practices was informed by a literature review and analysis of hospital episode statistics.

These important findings consolidate the outcomes of many studies, all published in 2010, focused on different specialities, which suggest that non-consultant care during out of hours delivery is much less effective in ICU,⁹⁸ de Graaf *et al.* (Peri-natal⁹⁹), Dorn *et al.* (Gastro Intestinal¹⁰⁰), Hong *et al.* (Cardiac¹⁰¹), James *et al.* (Renal¹⁰²), Marco *et al.* (Internal Medicine¹⁰³). The body of evidence that exists on increased mortality at weekends includes for example; Riciardi *et al.*¹⁰⁴ Aylin *et al.*¹⁰⁵ Maggs & Mallet¹⁰⁶ and Barba *et al.*¹⁰⁷ Riciardi *et al.*¹⁰⁴ considered mortality after non-elective hospital admissions in USA community hospitals by retrospective cohort analysis. This large, national study revealed significantly higher patient mortality during weekends than for weekdays for major diagnostic categories.

The researchers stated the underlying mechanism was unknown but possible factors included “differences in hospital staffing”. Aylin *et al.*¹⁰⁵ large, multicentre study of weekend mortality for emergency admissions in English acute hospitals indicated detrimental differences in many clinical indicators such as:- overall complications, delays in urgent procedures, survival post-cardiac arrest and mortality in acute myocardial infarction. After analysis of over four million emergency department admissions (2005/2006) the researchers estimated nearly 3,400 deaths may have been linked to the weekend care delivery service. In a smaller study of one District General Hospital in Bath, Maggs & Mallet¹⁰⁶ demonstrated total mortality was increased in emergency medical admissions out of hours, but not significantly at weekends. Barba *et al.*¹⁰⁷ considered mortality of adult patients at weekends.

However, Kazley *et al.*¹⁰⁸ compared quality and aggressiveness of in-patient care of stroke patients on weekends compared to weekdays and found no significant difference in mortality levels. Indeed, Schilling *et al.*¹⁰⁹ found three other variables beside weekend admission to have statistically significant association with in-hospital mortality; nurse staffing levels, high bed occupancy and seasonal influenza. This was a retrospective study of 166,920 patients admitted to 39 USA hospitals (2003–2006). A retrospective cohort study of infant deaths in Scotland (1985–2004) found babies born out of hours were more at risk of dying.²⁶ However, detailed analysis after exclusion of deaths from congenital abnormalities and standardising for gestational age outside 37–43 weeks queries this conclusion. The final sample was large (1039560 live births) and this size population increases the reliability of the research. This study follows inconsistent findings of twelve previous studies, cited by the authors, with reports of increased rates of perinatal death at the weekend and at night and others which show no difference after adjustment for birth weight. Although availability of senior clinicians is suggested as one possible causal factor many other variables are noted i.e. total staff profile and access to operating theatres. Fatigue in night staff could reasonably be postulated as a causal factor of accidents, safety breaches or adverse outcomes

out of hours but was discounted by the authors of this paper as no excess risk of death amongst women delivering at night compared to daytime at the weekends was identified.

The research findings discussed above (all published in 2010) and a wealth of earlier literature on out-of-hours care delivery illustrate the need for robust studies on consultant - delivered care which take into account the many variables existing in the healthcare context and cautions against directly linking weekend mortality figures with consultant input. NHS London¹¹ cites the Hospital at Night approach as a method with potential for providing best possible patient, care out of hours given the changes in permitted working patterns for doctors in training. This concept has been partially adopted in many London hospitals and depends on a multi-disciplinary team approach and requires clear definition of the consultant's role.

3.5 Studies providing evidence that consultants and middle grade trainees appear equally effective:

Only two studies were identified in this section.

Maslekar *et al.*¹¹⁰ undertook a single centre UK study of the difference in quality of surgical excision of primary adeno-carcinoma of the rectum in 130 patients (2001-2003) when completed by consultants or supervised senior colorectal trainees. The outcome of the excision was assessed with regard to quality of excision and local re-occurrence of the tumour and overall re-occurrence of cancer. There was no statistical difference between the outcomes achieved by consultants or senior trainees. The limitations of this study are that it is a specific speciality surgical technique carried out in an academic surgical unit i.e. under close supervision, which limits application to other areas.

Another study does not directly compare doctors in training with Consultants but it does confirm the skills of doctors in training who have delegated responsibility from senior medical colleagues. Bakaeen *et al.*¹¹¹ retrospectively reviewed a large cohort of patients (n=70, 616) who had undergone cardiac surgery in the USA. They demonstrated that the quality of surgery at the start of the academic year i.e. when there is an influx of new or junior residents, is not compromised. Senior medical teams, headed by Faculty members closely supervise and guide the residents.

4. DISCUSSION

This literature search has demonstrated a gap in empirical knowledge - irrefutable evidence of the value of consultant managed care. Such evidence would provide even stronger support for arguments for expansion of consultant numbers and inform the debate on the balance between “trained” and “untrained” doctors. However, such unequivocal experiments are difficult to undertake in healthcare delivery. Evidence cited in recent publications from medical organisations and bodies i.e. Promoting Consultant Expansion across the NHS⁵³ tend to relate to specialties which is not surprising given the absence of national, multi-site studies or reliable audit on consultant care. *The Medical Workforce Project*²⁰ did provide similar evidence to that provided in this report, mainly from specialties and single site studies.

This literature search has revealed considerable more evidence published since 2008. Comparison of studies is hindered by the wide scope of consultant responsibility and authority in practice and the existence of various sub-consultant roles held by post-graduate doctors in training and trained doctors. NHS London does provide survey evidence to support the assertion that: *“doctors in training may be exposed to circumstances beyond their capability... senior clinical leadership and wisdom is absent when it is most needed.”*¹¹

Reputable research projects considering work of junior doctors could evaluate the impact of consultant input as a variable. Cappuccio *et al.*¹¹² comparative study of the effect of 48 hour EWTD compliant rotas in the Clinical Decision Unit and an Endocrinology Ward in Coventry reports no compromise to patient safety. However, although the differing characteristics of the care areas and other variables are acknowledged, the published paper fails to identify the work role of Consultants which may have influenced the results.

In the identified literature the two studies reporting the effect of the junior doctors’ strike are probably the most useful in determining the balance between “trained” and “in-training” doctors and the importance of consultant-delivered care. In 2001 similar outcomes were reported during the junior doctors’ strike in Spain, including reductions in patient waiting times.¹¹³ Strong evidence of the positive impact of increasing consultant numbers is provided by the Geelhoed & Geelhoed⁴⁷ study. Randomised controlled trials or other multi-centre comparative studies could provide some insight but may be confounded by the lack of comparability between the roles of consultants in different practice area.

Therefore it appears there may be value in small well controlled studies at hospital unit level. Firstly, these could assist in defining what is meant by a consultant-delivered service and its workforce implications. Secondly, they could identify the quality of consultant-delivered care with regard to; patient-focused care, improved clinical outcomes, improved communication with other professionals, families and patients, benefits to the profession and effect on service delivery. Goddard⁴² asserts that there is now considerable evidence that a consultant-delivered service is the most cost effective solution for delivering specialist care. Therefore cost and productivity should be aspects of any future study. Qualitative studies may be useful in determining the effect on the patient’s experience. Establishing this evidence base would allow further research at local or national level comparing the difference when post-graduate doctors in training deliver care.

Finally, evidence in this search has predominantly related to hospital based consultants and a wealth of literature on the excellent quality of GP practice has not been useful to the focus of this paper. However, the Royal College of GPs response to the Academy's¹⁹ survey drew attention to the success in several London teaching hospitals where paediatric services are run on a new model. Acute admissions are reported to be dealt with far more effectively by fully trained secondary care clinicians. The model was developed following a review of London's specialist children's services.¹¹⁴ Similar service reconfigurations would alter the requirements for "trained" and "in-training" doctors in the NHS.

5. CONCLUSION

This review of the literature and the outcomes of the AMRC survey identified limited irrefutable evidence to allow comparison of the quality of care delivered by trained specialists versus post graduate doctors in training. There is a lack of tightly controlled unit level comparative research. However, there is considerable internationally shared professional knowledge, expert opinion and considerable secondary evidence to support decision-making with regard to future policy making on consultant-delivered care. This body of knowledge and expertise recognises the complications that arise from a lack of consultant presence, failure to care by non-consultant staff and it supports the concept of consultant-delivered care.



APPENDIX 1: EVIDENCE AS CITED CHRONOLOGICALLY IN SECTION 3, INDICATING YEAR OF PUBLICATION/ PLACE OF ORIGIN

3.1	3.2.1	3.2.2	3.3	3.4	3.5
Harvey <i>et al.</i> (2008) NZ Robinson <i>et al.</i> (2008) NZ	White <i>et al.</i> (2010) UK Sen <i>et al.</i> (2010) UK Wyatt <i>et al.</i> (1999) UK	BMA (2008) UK AMRC (2008) UK AMRC(2008) UK Geelhoed & Geelhoed (2007) Australia Temple Report (2010) UK Powell (2011) NZ RCOG (2010) UK RCOG (2011) UK CMACE (2011) UK AoMRC (2008) UK Smith & Dixon (2007) UK Murphy <i>et al.</i> (2003) UK Olah (2005) UK Sandall <i>et al.</i> (2011) UK Murphy <i>et al.</i> (2003) UK Olah (2005) UK Venning <i>et al.</i> (2000) UK Kinnersley <i>et al.</i> (2000) UK Townsend <i>et al.</i> (2004) UK RCOG (2010) UK CMACE (2011) UK CYPF NHS (2010) UK McNeill <i>et al.</i> (2009) UK CEM (2009) UK CEM (2010) UK Knight <i>et al.</i> (2008) UK Cantlay <i>et al.</i> (2006) UK O'Connor <i>et al.</i> (2004) Australia Terris <i>et al.</i> (2004) UK MacKensie <i>et al.</i> (2003) UK Armitage & Rosa (2002) UK Tenner <i>et al.</i> (2003) USA Wade <i>et al.</i> (2005) Australia Shorr & Bauwens (1992) USA Diamond <i>et al.</i> (1998) USA Meltzer <i>et al.</i> (2002) USA Kaboli <i>et al.</i> (2004) USA	NCAS (2009) UK NCAS (2011) UK NCAS (2011) UK Choudhry <i>et al.</i> (2005) USA Dhrampai (2010) UK Mullen <i>et al.</i> (2009) UK	NCEPOD (2009, 2007, 2002) UK RCOG (2011) UK CMACE (2011) UK GMC (2011) UK Duffy & Reynolds (2011) UK Zalkin <i>et al.</i> (2011) UK Madlom <i>et al.</i> (2002) SASM (2009) UK SASM (2010) UK Semmens <i>et al.</i> (2005) Australia Zaidi <i>et al.</i> (2011)UK Desai <i>et al.</i> (1999) UK Moreau <i>et al.</i> (2004) France Sacchetti <i>et al.</i> (1992) USA Lo <i>et al.</i> (2004) UK Lo <i>et al.</i> (2005) UK Smith & Poplett (2002) UK Davies 2002 (UK) Goddard <i>et al.</i> (2009) UK NHS London (2011)UK James <i>et al.</i> (2010) USA Dorn <i>et al.</i> (2010) USA Cavallazzi <i>et al.</i> (2010) USA de Graff <i>et al.</i> (2010) Netherlands Hong <i>et al.</i> (2010) South Korea Marco <i>et al.</i> (2010) USA Ricardi <i>et al.</i> (2011) USA Aylin <i>et al.</i> (2010) UK Maggs & Mallet (2010) UK Barba <i>et al.</i> (2006) Spain Kazley <i>et al.</i> (2010) USA Schilling <i>et al.</i> (2010) USA Pasupathy (2010) UK NHS London (2011)	Maslekar <i>et al.</i> (2006) UK Bakaeen <i>et al.</i> (2009) USA

APPENDIX 2: TARGET OF SEARCH STRATEGY; ELECTRONIC DATA INTERNATIONAL DATA BASE SEARCH AND PROFESSIONAL BODIES AND ORGANISATIONS

ELECTRONIC SEARCH *UK BASED UNLESS INDICATED	PROFESSIONAL BODIES AND ORGANISATIONS *UK BASED UNLESS INDICATED
MEDLINE, EMBASE OVID HMIC	Academy of Medical Royal Colleges General Medical Council British Medical Association Medical Education England
Google Scholar PubMed Science Direct EThOS GreySource	New Zealand Medical Association Association of Salaried Medical Specialists Canadian Medical Association Australian Medical Association
HealthSTAR (USA) Australian Medical Index (AMI) now Informat Health collection Scott's medical database RPAP Medical Information Service (Canada)	NHS UK NHS Scotland Health and Social Care in Northern Ireland NHS Employers
Cochrane Review	House of Commons Health Select Committee
The Kings Fund	Department of Health
	Centre for Workforce Intelligence (CfWI) Workforce Review Team (WRT)

APPENDIX 3: TERMS ADOPTED FOR THE PURPOSE OF THE LITERATURE REVIEW:

Consultant represents a fully qualified and experienced medical specialist employed who has completed post-graduate medical training. The post-holder is recognised to have considerable specialist knowledge, expertise and experience. Within the NHS in the UK a period of holding an honorary contract and number of years since graduation were positively associated with promotion to NHS consultant in a multivariate logistic regression analysis of administrative data 1991-2000.¹¹⁵ In this review all other non-medical “consultants” working in UK healthcare (nurses, professions allied to medicine etc) are excluded. The term attendant or is used in literature from USA and Australasia respectively. In many countries consultant status leads to eligibility for membership to a Royal or Professional College in a Specialty. The term hospitalists has been used in the USA and Canada for doctors of consultant level with more extensive generalist knowledge who provide medical care to acutely ill in hospital.

Post-graduate doctors in training (or shortened to doctors in training) represents post-graduate medical staff still being supervised and professionally assessed. All registrars, senior registrars in the UK and specialist registrars in Scotland are included. Junior trainee doctors are excluded. The BMA have expressed concern that UK doctors who hold a certificate of completion of training (CCT) may hold non-consultant posts in their roles as locum consultant, senior registrar and post-CCT fellows.⁵¹ Middle grade trainee doctors are a grade below consultant, providing resident on call cover. The term resident physician or resident is used in literature from USA and residency may include a period of internship. Residency is also used in Canada, Australia, South Africa and New Zealand.

Consultant-delivered care reflect various terms in the literature; consultant- led care,⁷⁰ consultant-based care,⁵⁰ consultant-based service ie one in which consultants lead the teams delivering all care, are involved in all major decisions and deliver treatment to patients appropriate to their level of skills and training.⁵³ The Temple review referred to consultant-delivered service as “consultant 24-hour presence, or ready availability for direct patient care responsibility”.¹⁹

APPENDIX 4: KEY WORDS FOR LITERATURE SEARCH

*Use of MeSH, Boolean, (s) and/ combined

Consultant, Post-graduate doctor in training
Attendant, Hospitalist, Specialist, Physician, Medical doctor, Surgeon, General Practitioner, Hospital consultant, Doctor, Medical Consultant
Doctor in training, Senior doctor, Resident, Internship, Senior Registrar, Specialist registrar, Middle-grade trainee
Consultant-delivered care, consultant managed care, consultant led care, consultant-delivered service
Medical workforce
Quality of care, patient care, outcomes, care outcomes, health outcomes, patient satisfaction
Productivity

APPENDIX 5: ORGANISATIONS INVITED AND SUBMITTING EVIDENCE

Organisations invited to submit written evidence to the Academy review

All of the Medical Royal Colleges within the UK
British Medical Association
Centre for Work Force Intelligence
COPMED
CMO for England
CMO of Northern Ireland
CMO of Scotland
CMO of Wales
Department of Health England
Foundation Trust Network
GMC
Health Foundation
Health Quality Improvement Partnership
Professor Sir John Temple
Kings Fund
London School of Hygiene and Tropical Medicine
Medical Directors
Medical Education England
Medical Protection Society
National Patient Safety Agency
National Voices
NCEPOD
NHS Confederation
NHS Employers
NHS Litigation Authority
NSCG
Patient Lay Group
Royal College of Midwives
Royal College of Nursing

Organisations submitting written evidence to the Academy review

Academy of Medical Royal College and Faculties in Scotland
British Geriatric Society
British Medical Association
Department of Health (England)
Faculty of Dental Surgeons
Faculty of Emergency Medicine
NCAS- National Clinical Assessment Service (NHS Patient Safety Agency)
NCEPOD
NHS Employers
NHS Specialised Services
Royal College of Obstetricians and Gynaecologists
Royal College of Surgeons (England)
Royal College of Surgeons of Edinburgh
Royal College of Physicians London
Royal College of Physicians Edinburgh
Royal College of Paediatrics and Child Health
Royal College of Anaesthetists
Royal College of General Practitioners

Royal College of Physicians and Surgeons of Glasgow
Royal Free Hospital
Several Individuals

Organisations invited to give oral evidence

BMA
Department Health England
NHS Employers
National Clinical Assessment Service

APPENDIX 6: MEMBERSHIP OF THE ACADEMY WORKING GROUP

Professor Terence Stephenson (Lead)

Chairman President Royal College of Paediatrics and Child Health, Vice-Chairman AoMRC

Dr Amanda Howe

Royal College of General Practitioners

Professor Wendy Reid

Royal College of Obstetricians and Gynaecologists

Dr Paul Fogarty

Royal College of Obstetricians and Gynaecologists

Dr Mike Jones

Royal College of Physicians of Edinburgh

Professor Sir Sabaratnam Arulkumaran

AoMRC Secretary

Dr Andrew Spooner

Royal College of General Practitioners

Mr Alastair Henderson

AoMRC Chief Executive

Mr Elliot Archer

AoMRC Project Administrator

The literature review was undertaken by Dr Chris Barrett and Dr Judith Curson

REFERENCES

- 1 National Confidential Enquiry into Patient Outcome and Death. (2009) Death in acute hospitals: Caring to the end? A review of patients who died within four days of admission. *NCEPOD*. London.
- 2 National Confidential Enquiry into Patient Outcome and Death. (2007) Emergency Admissions: A journey in the right direction? *NCEPOD*. London.
- 3 National Confidential Enquiry into Patient Outcome and Death. (2007) Trauma: Who cares? *NCEPOD*. London.
- 4 National Confidential Enquiry into Patient Outcome and Death. (2002) Perioperative deaths: Functioning as a team. *NCEPOD*. London.
- 5 Royal College of Obstetricians and Gynaecologists. (2011) RCOG's response to AoMRC survey. *Royal College of Obstetricians and Gynaecologists*. London.
- 6 Centre for Maternal and Child Enquires. (2011) Saving Mothers' Lives: reviewing maternal deaths to make motherhood safer: 2006-08. The Eighth Report on Confidential Enquires into Maternal Deaths in the United Kingdom *An International Journal of Obstetrics and Gynaecology* BJOG 2011; 118 (Suppl.1):1-203.
- 7 Harvey, M., Al Shaar, M., Cave, G., Wallace, M., Brydon P. (2008) Correlation of physician seniority with increased emergency department efficiency during a resident doctors' strike *The New Zealand Journal Medical – Journal of the New Zealand Medical Association* Vol 121 No 1272.
- 8 Robinson, G., McCann, K., Freeman, P., Beasley, R. (2008) The New Zealand national junior doctors' strike: implications for the provision of acute hospital medical services *Clinical Medicine* 8:272-5.
- 9 Bel, I C.M., Redelmeier, D.A. Mortality among patients admitted to hospitals on weekends compared with weekdays. *The New England Journal of Medicine* 2001;345:663–8.
- 10 Schmulewitz, L., Proudfoot, A., Bell, D. (2005) The impact of weekends on outcome for emergency patients. *Clinical Medicine Journal* 2005; 5: 621-625.
- 11 NHS London (2011) Adult Emergency Services: Acute Medicine and emergency general surgery. Case for change. *Nuffield Trust for NHS London*.
- 12 Wyatt, J., Henry, J., Beard, D. (1999) The association between seniority of Accident and Emergency doctor and outcome following trauma. *Injury* 1999; 30 (3):165–8.
- 13 Armitage, M., Raza, T. (2002) A consultant physician in acute medicine: the Bournemouth model for managing increasing numbers of medical emergency admissions. *Clinical Medicine* 2002; 2(4):331–3.

- 14 Moore, S., Gemmell, I., Almond, S. et al. (2006) Impact of specialists care on clinical outcomes for medical emergencies. *Clinical Medicine* 2006; 6: 286-93.
- 15 White, A. L., Armstrong, P.A.R., Thakore, S. (2010) Impact of senior clinical review on patient disposition from the emergency department *Emergency Medicine Journal* 27:262-265 doi:10.1136/emj.2009.077842.
- 16 Sen, A., Hill, D., Menon, D., Rae, F., Hughes, H., Roop, R. (2010) The impact of consultant-delivered service in emergency medicine: the Wrexham Model. *Emergency Medicine Journal*. doi:10.1136/emj.2010.107797.
- 17 Sinuff, T., Kahnamoui, K., Cook, D.J., Luce, J.M., Levy, M.M. (2004) The Values, Ethics, & Rationing in Critical Care (VERICC) Task Force. *Critical Care Medicine* 2004; 32:1588.
- 18 Hawryluck, L. (2006) Ethics review: Position papers and policies – are they really helpful to front-line ICU teams? *Critical Care medicine* 2006; 10: 242.
- 19 Temple, J. (2010) Time for Training: A review of the impact of European Working Time Directive on the quality of training. *Medical Education England*.
- 20 Academy of Medical Royal Colleges. (2008) Medical Workforce Project to identify the added value doctors bring to the healthcare team. *Academy of Medical Royal Colleges*.
- 21 Royal College of Physicians. (2011) Consultant physicians working with patients: The duties, responsibilities and practice in medicine. *Royal College of Physicians*. London.
- 22 College of Emergency Medicine. (2010) Emergency Medical Consultants: Workforce recommendation. *College of Emergency Medicine London*
- 23 McNeill, G.B.S., Brahmhatt, D.H., Prevost, A.T., Trepte, N.J.B. (2009) What is the effect of a consultant presence in an acute medical unit? *Clinical Medicine* Vol 9:3:214-218.
- 24 EQUIP. (2009) An In depth investigation into causes of prescribing errors by foundation trainees in relation to their medical education. *EQUIP*.
- 25 NHS Litigation Authority. (2011) Clinical Negligence Scheme for Trusts, Maternity Clinical Risk Management Standards: Version 1. *NHS Litigation Authority*.
- 26 Pausupathy, D., Wood, A. M., Pell, J. P., Fleming, M., Smith, G.C.S. (2010) Time of birth and risk of neonatal death at term: retrospective cohort study. *British Medical Journal* 2010:341:c498 doi:10.1136/bmj.c348.

- 27 Mullen, P., Dawood, A., White, J., Anthony-Pillai, M. (2009) Timing of first review of new ICU admissions by consultant intensivists in a UK district general hospital. *Critical Care* 13(Suppl 1): 476 (Suppl: 29th International Symposium on Intensive care and Emergency Medicine) *Doi:10.1186/cc7640*.
- 28 Cantlay, K.L., Baker, S., Parry, A., Danjoux, G. (2006) The impact of a consultant anaesthetist led pre-operative assessment clinic on patients undergoing major vascular surgery. *Anaesthesia* Vol 61:3, 234-239.
- 29 Zaidi, F.H., Corbett, M.C., Burton, B.J.L., Bloom ,P.A. (2007) Raising the benchmark for the 21st century-the 1000 cataract operations audit and survey: outcomes, Consultant-supervised training and sourcing NHS choice. *British Journal of Ophthalmology* 91:731-736.
- 30 Collins, J. (2010) Foundation for excellence. An evaluation of the foundation programme. *Medical Education England*.
- 31 Ward, D. (1999) Consultant Physicians working for patients: Part 1: A blueprint for effective hospital practice: Part 2: Job plans for specialist physicians. *Royal College of Physicians*.
- 32 Royal College of Physicians. (2010) Future Physician: Changing Doctor for Changing times report of a working party. *Royal College of Physicians* London.
- 33 Royal College of Paediatric and Child Health. (2011) Facing the Future: Standards and modelling for Paediatric services. *Royal College of Paediatric and Child Health* London.
- 34 Goddard, A. F., Hodgson, H., Newbery, N. (2010) Editorial: Impact of the European Working Time Directive on patient/doctor ratios and working practices for junior doctors in England and Wales 2009. *Clinical Medicine* 201:10(4): 330-5.
- 35 MacDonald, R. (2003) More doctors is not the answer to the EU Working Time Directive. *British Medical Journal* 2003;326:68.
- 36 MacDonald, R. (2004) How protective is the working time directive? *British Medical Journal* 2004;329:301-2.
- 37 Sheldon, T. (2004) Pressure mounts over European Working Time Directive. *British Medical Journal* 2004;328:911.
- 38 British Orthopaedic Trainees Association. (2009) British Orthopaedic Trainees Association position statement on the European Working Time Directive and Training in Trauma & Orthopaedic Surgery. *British Orthopaedic Trainees Association* London.
- 39 Association of Surgeons in Training. (2009) Optimising Working Hours to Provide Quality in Training and Patient Safety: A Position Statement from the Association of Surgeons in Training. *ASiT* London.

- 40 Royal College of Physicians (2010) EU Impact Assessment of the Working Time Directive: summary points. *Royal College of Physicians* London.
- 41 Goddard, A.F. (2010) Editorial: Planning a consultant-delivered NHS. *British Medical Journal* 341:c6034.
- 42 Goddard, A. F. (2010) Consultant physicians for the future: report from a working party of the Royal College of Physicians and medical specialties. *Clinical Medicine* 10:6: 548-54.
- 43 Department of Health. (2000) The NHS Plan. A plan for investment A plan for reform. Department of Health London.
- 44 Heyworth, J. (2001) Editorial: The NHS Plan-the sound of cavalry or zebras? *Emergency Medicine* 18:1-2 Doi:101136/emj.18.1.1
- 45 British Medical Association. (2009) Briefing paper: Debate on the European Working Time Directive. *British Medical Association*.
- 46 Scottish Audit of Surgical Mortality. (2010) Scottish Audit of Surgical Mortality: Annual Report 2010 Reporting on the 2009 data. *NHS National Services* Scotland.
- 47 Geelhoed, G.C., Geelhoed, E.A. (2007) Positive impact of increased number of emergency consultants. *Archives of Disease in Childhood* 2008 93:62-64 doi:10.1136/adc.2007.122531 (published on-line 2007).
- 48 Ward, D. (2009) Acute medical care: the right person, in the right setting – first time: how does practice match the report recommendations? *Clinical Medicine* 9 (5): 553-556.
- 49 Royal College of Physicians. (2010) An Evaluation of Consultant Input into Acute Medical Admissions Management in England, Wales and Northern Ireland. Royal College of Physicians London.
- 50 Royal College of Physicians. (2010) Census of consultant physicians and medical registrars in the UK, 2009: data and commentary. *Royal College of Physicians* London.
- 51 Jaques, H. (2011) BMA condemns rise in non-consultant CCT post. *BMJ Careers*. (on-line).
- 52 Madhava, H. (2010) Hybrid consultants. *BMJ Careers* (on-line).
- 53 British Medical Association. (2008) Enhancing quality: Promoting consultant expansion across the NHS. *British Medical Association* London.
- 54 Powell, I. (2011) Understanding the crisis that can't be avoided; The Business Case as a blueprint for the future. *The Specialist: Association of Salaried Medical Specialists Issue* 87:6-9.

- 55 Healthcare Commission. (2008) An independent review of serious untoward incidents and clinical governance systems within maternity services at Northwick Park Hospital. *Healthcare Commission* London.
- 56 Smith, A., Dixon, A. (2007) The Safety of Maternity Services in England. *The Kings Fund* London.
- 57 Sandall, J., Homer, C., Sadler, E., Rudisill, C., Bourgeault, I., Bewley, S., Nelson, P., Cowie, L., Cooper, C., Curry, N. (2011) Staffing in Maternity Units: Getting the right people in the right place at the right time. *The Kings Fund* London.
- 58 Venning, P., Durie, A., Roland, M., Roberst, C., Leese, B. (2000) Randomised controlled trial comparing cost-effectiveness of general practitioners and nurse practitioners in primary care. *British Medical Journal* Vol320, 1048-53.
- 59 Kinnersley, P., Anderson, E., Parry, K., Clement, J., Archard, L., Turton, P., Sainthorpe, A., Fraser, A., Butler, C.C., Rogers, C. (2000) Randomised controlled trial of nurse practitioner versus general practitioner care for patients requesting same day consultation in primary care. *British Medical Journal* Vol 2000, 1043-8.
- 60 Townsend, J., Wolke, D., Hayes, J., Dave, S., Rogers, C., Bloomfield, L., Quist-Therson, E., Tomlin, M., Messer, D. (2004) Routine examination of the newborn: the EMREN study. Evaluation of an extension of the midwife role including a randomised controlled trial of appropriately trained midwives and paediatric senior house officers. *Health Technology Assessment* Vol 8:4.
- 61 Royal College of Obstetricians and Gynaecologists (2010) Responsibility of Consultant on-Call (Good practice No 8). *Royal College of Obstetricians and Gynaecologists* London.
- 62 Murphy, D.J., Leibling, R.E., Patel, R., Verity, L., Swingler, R. (2003) Cohort study of operative delivery in the second stage of labour and standard of obstetric care. *British Journal of Obstetrics and Gynaecology* 110:610-15.
- 63 Olaf, K.S. (2005) Reversal of the decision for caesarean section in the second stage of labour on the basis of consultant vaginal assessment. *British Journal of Obstetrics and Gynaecology* 25:115-16.
- 64 NHS Making it Better for Children, Young People and Families (2010) Greater Manchester Children, Young People and Families' NHS Network: A Networking Approach to Achieving EWTD Compliance: End of Project Report. *NHS Making it better*.
- 65 Hanousek, J., Stocker, M.E., Montgomery, J.E. (2009) The effect of grade of anaesthetist on outcome after day surgery. *Anaesthesia*. 64(2) 152-5.
- 66 College of Emergency Medicine (2009) College of Emergency Medicine Survey Sept-Dec 2009. *College of Emergency Medicine* London.

- 67 Knight, M., Nelson-Piercy, C., Kurinczuk, J.J., Spark, P., Brockelhurst, P. (2008) A prospective national study of acute fatty liver in pregnancy in the UK. *Journal of Gastroenterology and Hepatology* GUT 57:951-956.
- 68 O'Connor, A., Lockney, A., Sloan, P. et al (2004) Does the presence of an emergency physician improve access based quality indicators in a rural emergency department. *Emergency Medicine Australasia* 2004; 16:55-8.
- 69 Terris, J., Leman, P., O'Connor, N., Wood, R. (2004) Making an IMPACT on emergency department flow: improving patient processing assisted by consultant at triage. *Emergency Medicine Journal* 21:537-541.
- 70 MacKezie, S., Norrie, J., Vella, M., Drummond, I., Walker, A., Molloy, R., Galloway, R., O'Dwyer, P.J. (2003) Randomised clinical trial comparing consultant-led or open access investigation for large bowel problems *British Journal of Surgery* 90(8):941-7.
- 71 Wade, V., Cheok, F., Schrader, G., Hordacre, A.L., Marker, J. (2005) Depression after cardiac hospitalisation--the Identifying Depression as a Comorbid Condition (IDACC) study. *Australian Family Physician* 34: 985-89.
- 72 Shorr, R.I., Bauwens, S.F. (1992) Diagnosis and treatment of outpatient insomnia by psychiatric and nonpsychiatric physicians. *American Journal of Medicine* 93: 78-82.
- 73 Diamond, H., Goldberg, E., Janosky, J. (1998) The effect of full-time faculty hospitalists on the efficiency of care at a community teaching hospital. *Annals of Internal Medicine* 1998;129(3):197-203.
- 74 Meltzer, D., Manning, W., Morrison, J. et al (2002) Effects of physician experience on costs and outcomes on an academic general medicine service: results of a trial of hospitalists. *Annals of Internal Medicine* 2002;137(11):866-74.
- 75 Kaboli, P., Barnett, M., Rosenthal, G. (2004) Associations with reduced length of stay and costs on an academic hospital. *American Journal of Managed Care* 2004;10:561-8.
- 76 Tenner, P.A., Dibrell, H., Taylor, R.P. (2003) Improved survival with hospitalists in a paediatric intensive care unit. *Critical Care Medicine* March 31(3)847-852.
- 77 National Clinical Assessment Service. (2011) National Clinical Assessment Service' response to AoMRC survey.
- 78 National Clinical Assessment Service. (2009) NCAS Casework-The first eight years. *National Clinical Assessment Service* (on-line).
- 79 National Clinical Assessment Service. (2011) Concerns about professional practice and associations with age, gender, place of qualification and ethnicity-2009/10 data. *National Clinical Assessment Service*.

- 80 General Medical Council (2011) State of Medical Education and Practice in the UK. GMC London.
- 81 Choudhry, N., Fletcher, R., Soumerai, S. (2005) Systemic review: the relationship between clinical experience and quality of health care. *Annals of Internal Medicine* 2005;142 (4):260–73.
- 82 Samuels, M.A., Ropper, A.H. (2005) Letter: Clinical Experience and Quality of Health Care. *Annals of Internal Medicine* Vol 143: 1:84.
- 83 Loder, E.W. (2005) Letter to Editor *Annals of Internal Medicine* Vol 143: 1:86.
- 84 Dharpai, A. (2010) Time to first review of new admissions to critical care by the consultant intensivist *Critical Care* 14 (Suppl 1):468 (30th International Symposium on Intensive care and Emergency Medicine, Belgium) *Doi:10.1186/cc8700* (on-line).
- 85 Duffy, D., Reynolds, P. (2011) Babies born at the threshold of viability: attitudes of paediatric consultants and trainees in South East England. *Acta Paediatrica, Nurturing the Child* 100:1:42-46 *Doi:10.1111/j.1651-2227.2010.01975.x* (on-line 2010).
- 86 Zalkin, M.D., Fertleman, C., Hodes, D. (2011) Paediatric registrar's views on current child protection training and willingness to undertake child protection work in the current climate: what needs to be? *Archives of Disease in Childhood* 96:A97.
- 87 Madlom, M., Singh, R., Rigby, A.S. (2002) Assessment of acute admissions by middle grade trainees and consultants will reduce the need for overnight hospital admissions. (Letter) *Archives of Disease in Childhood* 87:357-358 *doi:10.1136/adc.87.4.357-a*.
- 88 Scottish Audit of Surgical Mortality. (2008) Scottish Audit of Surgical Mortality: Summary Report 2008 data. *NHS National Services Scotland*.
- 89 Semmens, J.B., Aitken, F.M., Sanfillippo, F.M., Mukhtar, S.A., Haynes, N.S., Mountain, J.A. (2005) The Western Australian Audit of Surgical Mortality: advancing surgical accountability. *Medical Journal of Australia* 183:10: 504-508.
- 90 Desai, P., Minassian, D.C., Reidy, A. (1999) National cataract surgery survey 1997-8: a report of the results of the clinical outcomes. *British Journal of Ophthalmology* 83: 1336-1340.
- 91 Moreau, D., Goldgran-Toledano, D., Alberti, C., Jourdain, M., Adrie, C., Annane, D., Garrouste-Orgeas, M., Lefrant, J-Y., Papazian, L., Quinio, P., Pochard, F., Azoulay, E. (2004) Junior versus Senior Physicians for Informing Families of Intensive Care Unit Patients. *American Journal of Respiratory and Critical Care Medicine* Vol 169:512-517.

- 92 Sacchetti, A., Carraccio, C., Harris, R. (1992) Resident management of emergency department patients: is closer attending supervision needed. *Annals of Emergency Medicine* 1992; 21(6):749–52.
- 93 Lo, S., Fergie, N., Walker, C., Narula, A.A. (2004) What is the impact of consultant supervision on outpatient follow-up rate? *Clinical Otolaryngology Allied Science* 29(2):119-23.
- 94 Lo, S., Eze, N., Jonathon, D.A. (2005) The effect of consultant-led interactive pre-clinic case note review on follow-up rates of an otology outpatient clinic. *International Journal of Clinical Practice* 59(2)256-8.
- 95 Smith, G.B., Poplett, N. (2002) Knowledge of aspects of acute care in trainee doctors. *Postgraduate Medical Journal* 78:335-8.
- 96 Davies, I. (2002) Letter: Should inexperienced trainees be delivering acute medical services? *Postgraduate Medical Journal* 78:698.
- 97 Goddard, A.F., Hodgson, H., Newbery, N. (2009) Impact of EWTD on patient:doctor ratios and working practices for junior doctors in England and Wales 2009. *Clinical Medicine Aug* 10(4):330-5.
- 98 Cavallazzi, Marik, P., Hirani, A., Pachinburavan, M., Vasu, T., Leiby, B. (2010) Association between time of admission to the Intensive Care Unit and mortality: a systematic review and metanalysis. *Chest* 138 (1) 68-75.
- 99 de Graff, J., Ravelli, A., Visser, G., Hukkelhoven, C., Tong, W., Bonsel, G. et al (2010) Increased adverse perinatal outcome of hospital delivery at night. *BJOG: An International Journal of Obstetrics and Gynaecology*, 17:1098-1107.
- 100 Dorn, S., Shah, N., Berg, B., Neassens, J. (2010) Effect of weekend hospital admission on gastrointestinal hemorrhage outcomes. *Digestive Diseases and Sciences*, 55(6): 1658-166.
- 101 Hong, J., Kang, H., Lee, S. (2010) Comparison of case fatality rates for acute myocardial infarction in weekday vs weekend admissions in South Korea. *Circulation Journal*, 74 (3): 496-502.
- 102 James, M., Wald, R., Bell, C., Tonelli, M., Hemmelgarn, B., Waikar, S. et al (2010) Weekend hospital admission acute kidney injury, and mortality. *JASN: Journal of the American Society of Nephrology*, 21(5), 845-851.
- 103 Marco, J., Barba, R., Plaza, S., Losa, J., Canora, J., Zapatero, A. (2010) Analysis of the Mortality of Patients Admitted to Internal Medicine Wards Over the Weekend. *American Journal of Medical Quality*. Vol 5:4, 312-318.
- 104 Riciardi, P., Roberts, P.L., Read, T.E., Baxter, N.N., Marcello, P.W., Schoetz, D.J. (2011) Mortality rate after non-elective hospital admission. *Archives of Surgery* 146(5):545-551.

- 105 Aylin, P., Yunus, A., Bottle, A., Majeed, A., Bell, D. (2010) Weekend mortality for emergency admissions. A large, multicentre study. *Quality and Safety in Health Care*, 19:213-217 Doi:10.1136/qshc.02863.
- 106 Maggs, F., Mallet, M. (2010) Mortality in out-of-hours emergency medical admissions – more than just a weekend effect. *Journal of the Royal College of Physicians* 40:115-8.
- 107 Barba, R., Losa, J.E., Velasco, M., Guijarro, C., Garcia de Casaola, G., Zapatero, A. (2006) Mortality among adult patients admitted at weekends. *The European Journal of Internal Medicine* 17:322-324.
- 108 Kazley, A., Hillman, D., Johnston, K., Simpson, K. (2010) Hospital care for patients experiencing weekend vs weekday stroke: a comparison of quality and aggressiveness of care. *Archives of Neurology*, 67(1), 39-44.
- 109 Shilling, P., Campbell, D., Englesbe, M., Davis, M. (2010) A comparison of in-hospital mortality risk conferred by high hospital occupancy, differences in nursing staff levels, weekend admission, and seasonal influenza. *Medical Care*, 48(3), 224-232.
- 110 Maslekar, S., Sharma, A., Macdonald, A., Gunn, J., Monson, J.R., Hartley, J.E. (2006) Do supervised colorectal trainees differ from consultants in terms of quality of TME surgery? *Colorectal Disease* Nov (9)790-4.
- 111 Bakaeen, F.G., Huh, J., LeMaire, S.A., Coselli, J.S., Sansgiry, S., Atluri, P.V., Chu, D.C. (2009) The July Effect: Impact of the Beginning of the Academic Cycle on Cardiac Surgical Outcomes in a Cohort of 70,616 Patients. *Annals Thoracic Surgery* 88:70-75 Doi:10.1016/j.athoracsur.2009.04.022
- 112 Cappuccio, F.P., Bakewell, A., Taggart, F.M., Ward, G., Ji, C., Sullivan, J.P., Edmunds, M., Pounder, R., Landrigan, C.P., Lockley, S.W., Peile, E. (2009) Implementing a 48h EWTD-compliant rota for junior doctors does not compromise patients' safety :assessor-blind pilot comparison. *Quality Journal of Medicine* 102:271-282.
- 113 Salazar, A., Corbella, X., Onaga, H. et al. (2001) Impact of a resident strike at an urban teaching hospital. *Academic Emergency Medicine* 2001:8(8):804–8.
- 114 NHS Commissioning Support for London (2011) Children's and young people's project: London's specialised children's services: Guide for Commissioners. *NHS Commissioning Support for London*.
- 115 Mavromaras, K., Scott, A. (2006) Promotion to hospital consultant: regression analysis using NHS administrative data. *British Medical Journal* 332 (7534):148-15.

ACKNOWLEDGEMENTS

The Academy would wish to thank all organisations who submitted written or oral evidence and to the input from members of the working group.

Thanks are due to:-

Professor Terrence Stephenson for leading this work

Dr Chris Barrett and Dr Judy Curson for conducting the literature review

Elliot Archer and Alastair Henderson for their work on the project

The opinions and conclusions represent those of the Academy of Medical Royal Colleges rather than individuals or organisations contributing to the study.

Academy of Medical Royal Colleges
10 Dallington Street
London
EC1V 0DB

Registered Charity
Number 1056565