

South East Coast

Clinical **senate**

The Clinical Co-Dependencies of Acute Hospital Services: A Clinical Senate Review

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Email: england.clinicalsenatesec@nhs.net

Website: www.secsenate.nhs.uk

Foreword

There is now a major focus on the future role of acute hospitals. They need to better integrate their function with local community and primary care services, whilst also be able to deliver high quality, safe and accessible inpatient care to their populations with a wide range of general and specialist needs. The case for centralisation has been made for certain specific conditions and pathways, but for the majority of acute inpatient services, there is uncertainty as to the evidence and need for centralisation, and the impact on hospitals that might lose services.

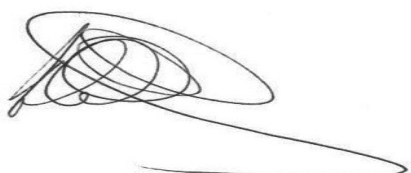
Patients increasingly have multiple medical conditions that require the input of a range of specialists, diagnostics and treatments to be available for effective inpatient care, and designing systems for such care must address this need through a detailed understanding of the clinical inter-relationship between the services. This can then be a platform to consider the different ways these services can be provided, both within individual hospitals and between them, such as via better clinical networking (involving service inreach and outreach and by developing effective telemedicine links). This will require better coordination and cooperation between provider organisations to underpin agreed clinical models.

On this basis the South East Coast Clinical Senate has responded to a request from our local commissioners for a review of the evidence base for the critical co-dependencies of acute inpatient services, and where there is an absence of evidence, to provide a clinical consensus view of service inter-dependencies. The aim was to provide a framework for the commissioners' future discussions with stakeholders on how their hospital infrastructure is configured.

This report provides the most comprehensive clinical review to date of the inter-dependencies between a wide range of acute hospital-based services. In line with the remit of clinical senates, the report provides independent, clinical advice, with significant patient and public involvement in the report and in the summit that was held to inform this work. As a generic report that is not county or region-specific, it is hoped that it will prove valuable to commissioners and providers in other parts of the country.

This work has only been made possible by the tireless and voluntary contribution of a wide range of clinicians and public and patient representatives from across South East Coast, and I would like to sincerely thank them for their efforts, and in particular the members of the clinical reference group. We have also worked hand in hand with the strategic clinical networks in our region, whose detailed knowledge of their specialist services and pathways, their resources and their input has been vital.

There are of course many factors and perspectives related to hospital configurations other than the clinical one, but it is of fundamental importance to understand the clinical relationships between services before embarking on service change, and it is hoped that this report will add to this understanding, and contribute to well informed local debates and planning of hospital-based services.



Lawrence Goldberg
Chair, South East Coast Clinical Senate



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Executive summary

Health care systems and their commissioners, in partnership with providers and the public, have to consider the most appropriate configuration of their hospitals so that their clinical services are adequately supported by other specialties, and they are fit for purpose, sustainable, accessible and deliver the highest possible quality of care. There is now a major national focus on the future shape and function of hospitals, triggered by the Royal College of Physicians' Future Hospital Commission, NHS England's Urgent and Emergency Care Review, Monitor's report 'Smaller Acute Providers' and most recently NHS England's landmark Five Year Forward View and the Dalton Review.

Whilst there are many factors that will need to be considered in hospital configurations, the clinical relationships and dependencies of hospital-based services on each other is key, whatever their size. There have previously been targeted reviews of selected specialist service dependencies, previous work in London on the core service dependencies in acute hospitals, and now NHS England national specifications for a wide range of specialist services. The Kings Fund has also recently published their review of the evidence for the reconfiguration of hospital services, in which certain key co-dependencies are described. To date though, there has not been work published on the mutual dependencies of the full range of services found in typical acute hospitals, particularly outside of large conurbations where hospitals are generally more widely dispersed.

On this basis, the seven Sussex CCGs (through their Collaborative) sought from the South East Coast Clinical Senate (SECCS) generic, evidence-supported clinical advice on the necessary relationships between acute hospital services, to inform their future local discussions and planning. The remit of the review was to provide generic advice, not region or locality-specific, and to identify evidence where it exists, or clinical consensus where it did not, to describe what services needed to be provided in the same hospital (either based there, or inreaching), and what could be provided on a networked basis. It is therefore hoped that this report will be seen as helpful in other counties and regions across England.

A literature review was conducted, and a clinical reference group established to lead the work. Eleven acute services were chosen as the principle components of current acute hospitals: A&E (Emergency Medicine), Acute Medical Take, Acute Surgical Take, Critical Care (ITU), Trauma, Vascular Surgery, Cardiac, Stroke, Renal, Consultant-led Obstetric Services and Acute General Paediatrics. In our region, the work on co-dependencies that the cardiovascular strategic clinical network (SCN) was already undertaking for the commissioners was integrated with the clinical senate's project, and all four of the SEC SCNs participated in this review.

The clinical dependencies of these 11 major acute services on 52 hospital based services was reviewed, and a four-level system for describing the strength of the dependencies was developed: Purple (needing to be based on the same site); Red (visiting or inreach services sufficient); Amber (patient could transfer to another hospital or site for ongoing care through network arrangements); or Green (loose or no direct relationship). The CRG's early conclusions were tested with wider



clinical and patient and public engagement at a clinical senate summit (held in September 2014) and the methodology and conclusions further refined.

Influencing the purely clinical considerations are a range of critical cross-cutting themes impacting on the location of hospital-based services or on planning new models of provision, which must be taken into account:

- The patient and public representatives participating in this clinical senate work made a number of strong and clear points. The driver for any service change should be an improvement in patient outcomes and experience; the importance of communication, both between professionals across patient pathways, and between the professionals and patients and their carers; making services as local and accessible as possible, including early repatriation to local care as soon as appropriate if the patient had required transfer to a specialist centre; ensuring early and meaningful dialogue with the public and patients about any proposed service change (recognising the wide demographic range of users of the NHS whose views should be taken into account); that changing the configuration of services cannot alone be relied on to fix underlying quality issues; and that for some patients, particularly the frail elderly, a more local 'bronze standard' service may be preferable to a 'gold standard' service that requires the patient to be treated far from their own and their family's home.
- Ambulance and transport services are key enablers of greater networking of hospital services, including by extending the competencies and responsibilities of the paramedic profession. However, they are a finite resource, and the additional demands on these services, such as for secondary transfer of patients to specialist centres and back, must be fully considered in any service change for their impact on primary conveyance from home to hospitals and back from hospital to the community.
- There are major workforce challenges in delivering the needed 7 day and 24/7 services both in hospitals and in the community, which of themselves are fundamental drivers for change. This relates not just to a pressure to centralise services, but also to rapidly align workforce planning with future NHS and social care needs and new models of care, and to increase the flexibility and adaptability of the workforce to mitigate against shortages in key areas, as well as recognising where shortages do and will exist, and addressing them urgently.
- Due importance should be given to the teaching, training and research agendas whenever service change is considered. There are opportunities from greater integration of and coordination between providers for all these three areas, which will maximise the skills, recruitment and retention of the workforce, and research activity (and income), but there are also significant risks if pathways become fragmented through poorly planned reconfigurations or expansion in alternative providers.

It was clear from the evidence review that in only a few areas were there randomised controlled trials or high quality formal studies in this field to guide the assessments. However there were many guidelines, particularly from the medical royal colleges and specialist societies, to refer to which specified some of the necessary relationships. In addition, a number of designated specialties, such as Major Trauma and Vascular Surgery, have NHS England national definitions and requirements as produced by the national clinical reference groups, which are referred to. In



areas without specific guidance, the clinicians involved in this project worked to achieve a consensus, based on experience and judgement.

Once the clinical dependencies grid was completed, it became possible to identify core groupings of services required to be based in the same hospital site. In particular, hospitals with emergency departments (A&Es) receiving all acute adult patients (an 'unselective take') need on-site acute and general medicine, acute surgery, and critical care (ICU). Therefore such hospitals need to provide the supporting clinical services that are required by all or any one of these four core inter-related acute specialties, and these are described in the report and can be read off the grid. These amalgamated requirements delineate what an emergency hospital should provide on-site as a minimum.

The dependencies of the other more specialist services were also reviewed, and are identified. Other than services such as Major Trauma or Vascular Surgery hubs, where requirements are clearly specified, the 'spoke' services in these networks, such as Trauma Units, Vascular Surgery spoke units, or non-interventional cardiology services, are likely to be more heterogeneous, and dependent on the nature of and distance from their network hub, and the existing co-location of related services.

Note should be made that rapidly available acute mental health services (liaison psychiatry) was considered a key requirement of all reviewed acute services.

Telemedicine-assisted ways of working is identified as a powerful enabler of more effective networking and leveraging of specialist services over a wider geographical area, thereby reducing unnecessary patient travel and inconvenience. The impact of development and wider roll out of such technologies will of course affect the grid ratings shown in this report.

It is important to understand that clinical senates are advisory bodies, not statutory, so the recommendations from this report are not mandatory. Given the absence of a large evidence base for this co-dependency review, and a reliance on clinical consensus and judgment in many areas, it must be also be acknowledged that consensus of any kind is open to bias on a range of fronts, is not cast in stone, and is challengeable. However this independent, clinical report aims to provide a baseline from which to have detailed local discussions about necessary co-dependencies and co-locations, and to explore different ways in which services could be delivered if not physically based on the same site.

Finally, developing strong and more integrated relationships between provider organisations and their clinicians within and across regions is essential to maximise the range of options available to provide the highest quality services in the most accessible and sustainable way possible.



1. Introduction and background

The NHS is under pressure from constrained financial resources against a growing and aging population with increasing co-morbidities, the development of new and expensive technologies, devices and therapies, and the requirements to deliver higher and more uniform quality and safety of care. In addition the recognition of poorer outcomes at weekends has led to the requirement that the NHS will implement more uniform seven day services by the end of 2016/17 (1)(2), whilst there are significant multi-professional workforce constraints. All of these drivers have led to a radical re-think of how hospitals deliver their acute care, and how their services might be re-configured.

The distribution of clinical services across hospitals in England has evolved over many decades, without an over-arching framework to define the clinically necessary relationships (co-dependencies) between them. More specifically, whether services are co-located (based within the same hospital) or support each other through other arrangements (e.g. networks and patient transfer) is only partly determined by objective clinical necessity and published recommendations from the professions. Geographical imperatives, provider ambitions and viability, financial drivers and historical service location, have also been major factors in local health system configurations.

There is lack of confidence and uncertainty about the evidence base for which acute hospital services need to be co-located or otherwise related, which makes the commissioners' (and providers') job challenging when modelling necessary or desirable future hospital configurations. This is overlaid by the rapidly evolving policy context for the future shape of hospitals in England:

- The current NHS England five year planning guidance (3) requires CCGs to 'determine the footprint of their urgent and emergency care networks during 2014/15', and 'be ready in 2015/16 to begin the process of designation for all facilities within their network'. For some specialised services, the planning guidance also states that they need to be concentrated in centres of excellence, 'consolidating services where appropriate, to address clinical or financial sustainability issues', and 'maximize synergy from research and learning'.
- Since then, the Urgent and Emergency Care Review (UECR) (4), The Future Hospitals Commission of the Royal College of Physicians ((5), Monitor's report on the future of smaller hospitals (6), NHS England's Five Year Forward View (7) and most recently the Dalton Review on new organisational models for providers (8), have all been published, and it is clear that there is increasing flexibility for how hospitals configure, inter-relate, and integrate with primary care and community services.
- The UECR (4) outlined a major change programme to modernise the way urgent care is delivered. There is a resulting major focus on how to deliver more and better urgent care services out of hospital (including enhanced self-care, better access to out of hospital services such as effective 111 services, extension of the roles of paramedics and pharmacists, seven day primary and community care services and urgent ambulatory care). However, for patients needing hospital admission, there is an imperative to ensure that patients receive it in a centre that will deliver high quality, sustainable care at whatever time they need it. The UECR states that 'people with serious or life-threatening emergency need to receive treatment in centres



with the right facilities and expertise to maximize chances of survival and good recovery', and that such people 'must receive treatment at centres with the necessary facilities and expertise, 24/7'. It describes two types of hospitals in the future: 'Emergency Centres' (ECs), and 'Specialist (originally termed Major) Emergency Centres' (SECs). Both types of hospitals need to be able to receive, assess and refer all patients (both adults and children) with urgent and emergency care needs, but in addition SECs would include specialist facilities that receive patients from ECs, or directly from an ambulance that has bypassed an EC. It has not been specified exactly what and how many specialist services make a SEC, though the UECR lists examples of such services (major trauma management; stroke thrombolysis; emergency vascular surgery; specialist paediatric facilities; level 3 critical care; interventional radiology).

- Delivering seven day services for acute care will be written in as national quality requirements to NHS standard contracts over 2015/16 and 2016/17, based on ten standards for acute care (1)
- Monitor (6) found that district general hospitals in England are far from small in comparison with Europe (the average number of beds in English hospitals with operating revenues below £200m is 435), and they found no relationship between the size of English hospitals and selected high level care quality indicators (though service-specific outcomes were not reviewed). In addition, the 20 most commonly provided service specialties in these smaller hospitals (that accounted for 86% of inpatient admissions) are more general rather than specialist services (see Fig 1. of Monitor's report), for which there is much less evidence for the benefits of centralisation.
- From a more clinical perspective, the Royal College of Physicians' Future Hospital Commission identified the need to design hospital services based on the needs of patients, and that there should be an appropriate balance between specialist care delivered by a range of different clinical teams, and the need to deliver coordinated and holistic care in hospitals by generalists (5). It also emphasised that specialist medical teams should be 'assessed according to how well they meet the needs of patients with specific conditions across the hospital and health economy' i.e. taking a population rather than an organisational focus (5)
- The Five Year Forward View (with further detail provided by the Dalton Review) now describes a range of new organisational models for smaller acute hospitals 'that enable them to gain the benefits of scale without necessarily having to centralise services', such as through integrating with primary and community services within Primary and Acute Care Systems (PACS), whilst at the same time describing how some specialised services could be provided to smaller hospitals from other organisations, or via urgent and emergency care networks (where hospitals are linked to 'ensure patients with the most serious needs get to specialist emergency centres').
- Dalton notes that 'the time is right for providers to examine their existing service portfolios, clinical models of care and be clear on the supporting organisational forms to ensure they are fit ... to meet the changing needs and expectations of patients'. The report also states that 'getting the clinical model right first should lead to organisational form later', i.e. form should follow function (8).



- Whilst previous drivers for the reconfiguration of services have been varied, the recent analysis by the Kings Fund of NCAT reviews over recent years identified costs and workforce as much more common drivers than quality and access (9).

As local and regional health economies now chart their way forward in response to the pressures and to the new organisational opportunities, it is vital to maintain a clinical and patient perspective. Specifically for health systems delivering acute care, a detailed understanding of the clinical inter-dependencies of hospital services is required to ensure that any planning for future re-configurations is clinically appropriate.

On this background, the seven Sussex CCGs, through their Collaborative, requested of the South East Coast Clinical Senate (SECCS, the 'Clinical Senate') that it undertake an independent clinical review of the clinical inter-dependencies of acute hospital services, taking account of the available evidence (studies, national guidelines or consensus statements), and deploying its access to expert clinical and patient resources to provide its guidance. Importantly, the CCGs' request was not for site- or region-specific recommendations, but for a generic, independent clinical report that would inform their forthcoming hospital planning strategies and discussions.

Defining necessary co-locations and co-dependencies for hospital services is of relevance throughout the country. Co-dependency work has been undertaken previously for certain services, such as in the London Health Programmes clinical dependency framework for acute medicine, surgery and obstetrics (10) and for cardiac services and vascular surgery (11), and by the Department of Health for specialist paediatric services (12). Our report reviews all together a wide range of acute specialties, to provide as broad a view and perspective as possible in deciding on the necessary groupings of services within and associated with acute hospital care, and to consider the co-dependencies, and without a specific metropolitan perspective.

This report focuses primarily on acute non-elective inpatient services, and does not address the dependencies of every possible acute general or specialist service. We have however worked closely with the four strategic clinical networks (SCNs) in South East Coast, in particular the cardiovascular SCN who had earlier been commissioned to undertake related work on co-dependencies in relation to stroke, cardiac and vascular surgical services.

This report also does not address the many changes that are being considered and planned for out of hospital community-based urgent care as described in the UECR, though such developments will significantly reduce the pressures on acute hospital beds through admission avoidance and enhanced onward care, increasing hospitals' future potential capacity and functional flexibility.

We recognised the vital importance of a range of cross-cutting themes and perspectives that had to be taken in to account in this report, to balance the purely service-specific judgements of inter-dependencies. Healthcare workforce issues loom large as drivers for change; ambulance and transport capacity and function are critical; the provision on acute mental health care to patients in acute hospitals must be addressed; and the implications of changing the location of services on teaching, training and research must be understood.

Finally, the perspective of patients and the public, alongside purely clinical considerations, is essential, so that the prime importance of patient experience and outcomes is recognised, and we have ensured their involvement throughout this process.



2. Methodology

2.1 Defining the task given to the South East Coast Clinical Senate

The approach to SECCS from the Sussex Collaborative (the coordination group of the seven Sussex CCGs) was made using the SECCS's criteria for an appropriate clinical senate topic, and this was then debated and agreed with the SECCS Council at its June 2014 meeting.

The specific agreed question asked of SECCS was:

'What are the clinically necessary co-locations (i.e. same site) and co-dependencies (which could be provided on a networked basis) for acute hospital-based services?'

A list of the major acute inpatient hospital services was agreed, whose clinical dependencies should be described. It was subsequently agreed that the ongoing work of the SE Coast's Cardiovascular Strategic Clinical Network (SCN) on their services' co-dependencies should be aligned with and included in this senate work, which explains the various specialist cardiac services which are included in the rows, along with stroke and renal services from that SCN.

Eleven main acute services were agreed: A&E, acute medicine, acute surgery, critical care, trauma, vascular surgery, cardiac, stroke, renal, consultant-led obstetric services and acute general paediatrics. For trauma and vascular surgery, the distinction was made between tertiary centres, or 'hubs', and networked referring centres, or 'spokes'. It was not considered feasible to review the dependencies of all acute hospital services given the resources and timescale available for this work. The dependencies of elective services, whether general or specialised, was outside of the remit of this work. The definitions of these 11 agreed major acute services are shown in Appendix B.

A wide range of clinical services that might support these defined major acute services was then agreed. There were 52 supporting services described, including diagnostics and therapies. The list and their definitions are also shown in Appendix B.

2.2 Evidence base and literature review

A literature review was commissioned from Library and Knowledge Service of Brighton and Sussex University Hospitals NHS Trust. The key search terms used were *reorganisation OR redesign OR sustainab* OR centralisation OR decentralisation OR configuration OR co-location OR collocation OR colocation OR interdepend* OR inter-depend* OR codepend* OR co-depend**. Accepted evidence included original research, but also so called 'grey literature' that includes guidelines and consensus statements, harvested from general search engines, domain-specific searches of key sites, sites' built-in search facilities and browsing publications lists. Key documents were also prospectively citation-searched or snowballed.



During the course of this work, access to the early draft and literature base of the Kings Fund report, 'The reconfiguration of hospital services: what is the evidence?'(9) was made available, from which relevant references were also obtained.

This was not a systematic review however, and it is acknowledged that there will be publications or recommendations that may have been missed. Through the combination of the above approaches, and the additional input of the wide range of senior clinicians involved in the project who identified further relevant references, it is hoped that the most important documents have been accessed.

Whilst it was the intention to grade the evidence using the Oxford classification system, this did not prove practical. Whilst this is not a formal guidelines document, the general principles of the AGREE II principles (13) were followed.

2.3 Clinical reference group and steering group

Experts from within the South East Coast counties of Kent, Surrey and Sussex were invited to be the theme (row) leads for the specified major acute services. Where the service (in either the row or column) fell within one of the four SCNs, the SCN clinical director or the SCN clinical lead for that specialty were invited on to the CRG to lead the review of their services' co-dependencies.

Other CRG members were invited to join on the basis of a combination of experience, expertise, role and vitally preparedness to devote their time to participate in this work in the short time scales required. All CRG members were requested to work as impartial professionals, and not as representatives of their organisations. A full list of the CRG is found in section 10.2.

2.4 Grid development

A co-dependency grid was developed for this work, for which there are published precedents, such as in the Department of Health's publication on specialist paediatrics(12), and that of the London Health Programmes (10,11) though it must be noted that the colour coding developed in our work has different definitions from those used in these publications. The 11 main acute services defined for this work formed the rows of the grid, and the wide range of other clinical services that might be needed to support these services formed the columns in the grid. It is recognised that not every possible hospital based service, particularly more elective services, has been included, and pharmacy services, though included in the cardiovascular SCN's work, was not included in this clinical senate work.

2.5 Scoring the strength of clinical services' dependencies

A colour coding scheme was developed as an easy, graphical way of summarising service dependencies. Initially a three colour (Red, Amber and Green) code was used, in which Red was defined as any service which needed to come to the patient (whether co-located in the same hospital as the patient's prime service, or a visiting (inreach) service. Following discussion at the summit and at the CRG, it was agreed that it was very important to distinguish between services that should be co-located (given the new Purple colour code), and those that could equally well provide care by an inreach or visiting service (re-defined as Red). It was also agreed that defining



a maximum appropriate response time for a visiting (Red) service of within 2, 4 hours or 24 hours, should be described, where it was possible to so define.

Grid colour rating scale

The resultant four-colour grading system, based on a Purple, Red, Amber and Green, is shown in figure 1 below. Note that throughout this document, when a colour rating of a dependency is referred to, it is capitalised.

Figure 1. Grid co-dependencies: colour rating scale

| CO-DEPENDENCIES DEFINITIONS: COLOUR KEY | |
|--|-----------------|
| The colour describes the dependency of the service in the row, on the support service in the column. Note that both the Purple and Red dependencies describe column services that should not require the patient to move hospitals | |
| PURPLE | |
| Service should be co-located (based) in same hospital | |
| RED | |
| Service should come to patient (patient transfer not appropriate), but could be provided by visiting/inreach from another site (either physically, or via telemedicine links) if not based in the same hospital | |
| 2 | Within 2 hours |
| 4 | Within 4 hours |
| 24 | Within 24 hours |
| | Not specified |
| AMBER | |
| Ideally on same site but could alternatively be networked via robust emergency and elective referral and transfer protocols | |
| GREEN | |
| Does not need to be on same site. Appropriate arrangements are in place to obtain specialist opinion or care | |

2.6 Clinical Senate summit and wider engagement

To widen the engagement and expert input to this work, a summit was held to which individuals from a wide range of clinical backgrounds and roles, as well a public and patient engagement experts, were invited. It was not possible however to get full representation at the summit of clinical experts from every specialty in the columns on the grid, both due to the time available to arrange the summit, and the need to have a manageable total number of attendees for such an event to achieve consensus.

CRG members delivered presentations providing the background and context to their themes in relation to this work, and summarised the draft conclusions. The draft co-dependencies grid was



presented and discussed, and working tables on each of the themes debated, developed and challenged the conclusions, and provided a wider perspective. The outputs of the summit discussions were captured and incorporated as best as possible in this report. A list of attendees at the summit can be found on the clinical senate website at <http://www.secsenate.nhs.uk>

2.7 Validation process

Finally, a validation process was undertaken in order to maximise the robustness of the grid scoring and conclusions. This validation consisted of three parts:

- CRG Chair feedback and challenge.
- Internal CRG consistency check, whereby grid squares that involved a row and column lead who were different discussed and confirmed the colour rating.
- External validation. CRG members were asked to share the grid ratings with a range of clinical colleagues at their discretion, to sense-check their conclusions. For the SCNs, they had a range of sources by which to do this (through their clinical advisory groups etc.).



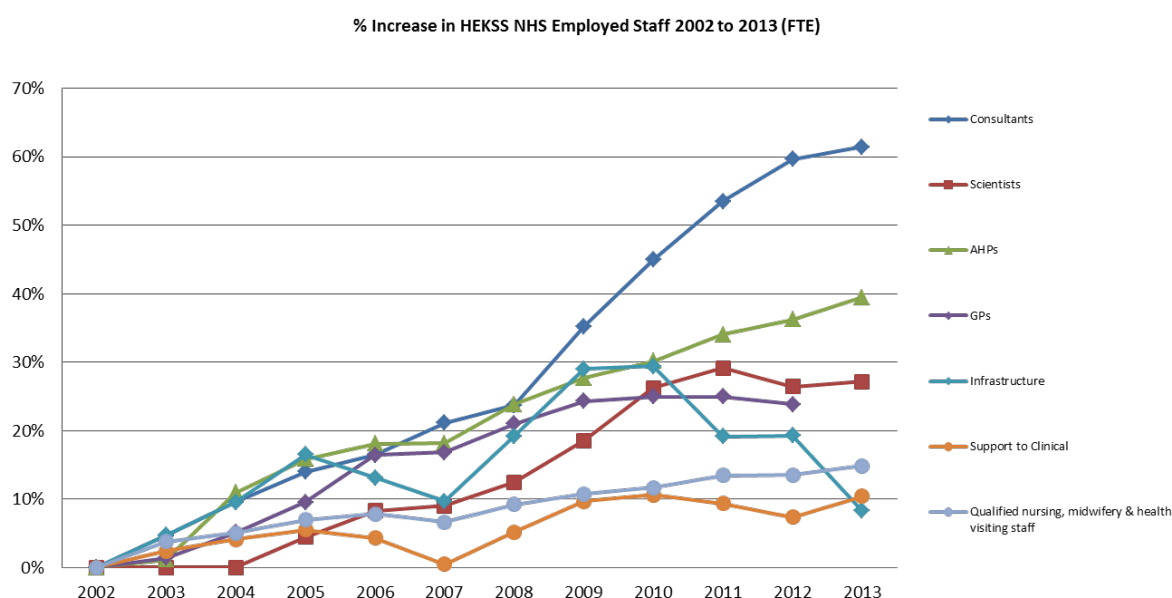
3. Cross cutting themes

3.1 Workforce

The workforce challenges that currently exist within the NHS are reflected within Kent, Surrey and Sussex (KSS). There are a number of key national drivers which require a workforce solution:

- National Quality Board - Safe Staffing Levels (14).
- 7 day working – skills mix, new ways of working (15) .
- Employment arrangements – NHS/AQP/Independent Sector
- Integrating Health and Social Care – One Team (16), and the health and social care personalisation agenda (17).
- Dementia and the aging population

One of the biggest challenges is to understand the requirements for a multi-professional workforce to deliver future service expectations of the population. For example, workforce trends over the last 12 years across KSS (see graph below) show a major expansion in consultant numbers and allied health professionals (AHPs) in particular, but a notable absence of recent growth in GP and nursing numbers:



Existing workforce challenges

The composition of the workforce has changed and will need to continue to change. The growing elderly population with increasing comorbidities, frailty and health care needs, and new medical



procedures and increasing use and utility of information technology in health care is constantly changing models of service provision and the workforce composition and skills required. It is vital therefore that workforce planning is not based on service models that are already or about to become outmoded.

There are a number of workforce factors which may be drivers for change, or conversely the reorganisation of services may provide some respite for some of the skills shortages, such as:

- A&E: Medical, ENPs, Trainees, Diagnostics
- Primary Care: GPs, Practice Nurses, Pharmacists
- Community Care: Nurses; District; Community; Paediatric
- Social Care: Nursing, Support Staff, personalisation agenda
- Mental Health: Liaison Psychiatry

Some of these workforce shortages are about specific professional groups, however many are about skills rather than profession, some examples of which can be addressed in innovative ways, are:

- Decision making: shared, from senior clinicians to call centre staff
- Acute skills in the community and primary care: e.g. tracheostomies, catheters, COPD, UTIs
- Multiple complex needs: higher dependencies in the community
- Managing confusion
- Managing risk
- Mental wellbeing: especially anxiety and depression
- Minor health problems: hydration, diarrhoea and vomiting, mobilisation and balance.

Many of the above skills are within primary, community and mental health care, and in social care, not just A&Es, which could enhance the capacity of the system to keep people out of hospital.

What are the key workforce questions that need to be answered when considering the configuration of urgent and emergency care configuration?

- What is the prime workforce challenge for emergency and urgent care: is it staffing the acute hospital-based services to meet constant and increasing demand, or is it meeting the demand outside of hospital with an increased workforce in primary, community and social care? Or both?
- Do we need new roles, or do we need to better use and develop existing roles?
- Is it just a question of staffing numbers, or is it culture and working practices as well?
- How do the co-dependencies of acute hospital-based services affect workforce issues?

How can workforce planning meet the challenges of a networked approach to service provision?

It is essential that planned service developments are linked to a realistic and sustainable workforce plan. Current workforce planning does not lend itself to a multi-professional team approach to



providing care. It is still a profession-specific methodology with little clarification around specialisms, knowledge, experience or skills required. The medical aspects of workforce planning are still driven by national direction and more needs to be developed to link it to the needs of the service for the local and regional populations. This will ensure that requirements such as consultant delivered service and the impact of that on the medical workforce are taken into account through the local whole workforce planning process.

The plans need to ensure sufficient capacity and sustainable recruitment, for 7/7 or 24/7 rotas if required, for the whole workforce. To ensure this can be met, there needs to be identification of the skills required of the workforce, and that they are used where they provide greatest effect. For example, in the outpatient setting, can doctors, nurses and other health care professionals provide the services in different ways?

The workforce needs to be focused where it is needed, and not necessarily where it has historically been. The planning of this will require cultural, organisation and system change. Planning needs to encompass the whole pathway, including the ambulance service who need to have the workforce with the skills to avoid A&E attendance where possible, and can transport patients direct to the right community or hospital-based service.

There is wide recognition that the number of patients with mental health needs is increasing and that staff need to have the skills to identify these patients and ensure they are supported appropriately.

Finally, the planning system needs to consider new ways of working such as technology both in terms of managing the system, e.g. appointments, and also the impact on workforce of new technologies such as equipment in acute settings.

Planning needs to support the requirement for flexibility of roles, and that generalists (across the health care professions) do not always need to become specialists which can lead to inflexible services for patients.

Crucially, workforce commissioning by nature needs to be several years ahead of the service need (given the lead time for the training of professionals in new or extended roles) and we therefore the need to identify tomorrow's skills requirements in our workforce planning now.

3.2 Patient and public perspective

The patient, carer and public perspective on clinical co-dependencies and the configuration of hospital services was considered essential to this project. There was strong representation on the project's CRG, involvement of the SEC Public and Patient Engagement Reference Group (PPERG), and a substantial contribution to the clinical co-dependencies summit event (more than 10% of participants).

Prior to the summit, discussions had been held with the PPERG and other patient leaders. A consistent theme in conversations was the balancing decision that individual patients may need to make between on the one hand, having access to high quality specialised services which may be centralised, and on the other hand access as close as possible to home, all taking account of the patient's age, frailty and health issues, family support and transport.



A list of principles was drawn up from the initial conversations with the PPERG and patient leaders which informed the debate on the day. These were:

- Getting the co-dependencies right should mean improved outcomes for patients.
- A need within the clinical debate to remember the patient.
- Good communication along whole patient journey – with patient and carers and between professionals – is essential.
- Ensure good access to diagnostics – theory and practice may be very different.
- There is a good process for patient repatriation following acute specialist intervention.
- Services are well planned, and provided in a timely way.
- Good and accessible rehabilitation is readily available.
- Maximise the role of local community services and their effect on patient experience and outcomes.
- Maximise the local network arrangements.
- We can't rely on changing the location of services to automatically improve the service.
- Patients and the public need to acknowledge and understand the clinical challenge of the co-dependencies/co-location debate.
- Acknowledge that any co-dependency work requires a process of engagement with patients and the public.

At the summit, as an integral part of the event, our patient, carer and public representatives provided a welcome challenge during table and plenary discussions. Specifically their role was to: ensure the views of patients, carers and the public informed the debate; help to determine the principles to be taken into account when commissioners consider co-dependencies; highlight the potential impact and consequences for patients, carers and the public of the clustering of co-dependent services; put additional challenge into the debate.

Subsequently, during the summit key points emerged from the patient and public perspective:

- The 'magic wand' factor. This was a strong message to commissioners about ensuring that current and planned services, processes, procedures and whole patient pathways do and will run smoothly before change takes effect. Services which are failing now need to be fixed as we cannot assume a change in service configuration on its own is a 'magic wand'.
- Evidence and consensus. There is limited evidence available and ratings are often agreed from a consensus perspective which is subjective and should not be taken to be objective.
- Future public, patient and carer engagement. This should be at a much broader level and as diverse as possible, across age, ethnicity, gender etc., to ensure all relevant perspectives are taken in to account. It is important to be aware that our individual opinions may change over time, depending on our circumstances and place in life at that particular time. In certain circumstances patients may choose a 'bronze' service for reasons of accessibility rather than a 'gold' centralised service. Commissioners need to be aware of whose views are driving the insight from engagement. For example Foundation Trusts have a large membership base, and all hospitals have access to PPE groups, which could be drawn on for further engagement work. Early engagement will be especially important to



avoid perceptions of change being purely cost driven and not necessarily in patients' best interests.

- Staff engagement. This is also important and should start informally as early as possible as staff views and feelings may indirectly reflect patient experience.
- Communication. When a patient is being transferred or rehabilitated or repatriated to their community, the transition should be seamless, and the right number and skill mix of staff should be in place to facilitate this. Factsheets on how proposed changes would improve the patient journey as well as clinical outcomes are imperative. Patients and the public need to know that changing how services are delivered will result in an improved service because x, y, and z have been put in place. If communication is purely top down or is perceived in that way it will be harder to reassure patients and the public of the real reasons for change.
- Partnership. The co-dependencies work provides a real opportunity to forge a more equal partnership between patients and health professionals. We must ensure that a full explanation of the patient's pathway is communicated, including treatment, the care plan, named consultants, nurses etc. More importantly, we must ensure that if the patient does have a query they are empowered to ask at any point during their journey and have reassurance that they will receive a prompt answer. Equally, if they have concerns about their care, that they are encouraged to voice this, so this can be remedied in real time rather than when the patient is discharged and a complaint has to come through formal channels (such as PALS) later.

3.3 Mental health in acute hospitals (liaison psychiatry)

Liaison psychiatry is a critical service that should be integral to all acute hospitals (18). Services comprise multidisciplinary teams skilled to integrate mental and physical healthcare in people whose mental health problems arise in, or have an impact on management of, physical illness and symptoms. These services are sometimes known as psychological medicine services, and are distinct from acute mental health inpatient units and community mental health care.

Such services improve quality of care, dignity and quality of life for patients, improve mental health skills in non-mental health professionals and Reduce adverse events and other risks to the acute hospital. Financial benefits come from reduced avoidable costs and ineffective or inappropriately located management of mental health problems by reduced length of stay, readmissions and investigations, and improved care of medically unexplained symptoms, dementia and long-term conditions (19).

Mental health problems are common, increasing and more prevalent in acute hospitals than in the community (19). Mental health problems occur in 30–60% of inpatients (20) and are the presenting feature in 5% of all emergency department attendances.

The position that mental health services should be co-located with major hospitals for most specialties comes from the evidence base which shows that the most benefit is derived from services which are fully integrated with general hospitals, to overcome the divide that has been created by separating these services. The government's mental health strategy 'No Health Without Mental Health' (21) supports the position that this divide must be overcome and notes the high rate



of mental health problems in general hospitals that go undetected and have an impact on recovery and cost. The Royal College of Psychiatrists has formulated national standards which supports the position of 24 hour consultant led services based on the general hospital site, and includes suggested response times and roles that these services would provide (22). There is a role for generic liaison psychiatry services which can serve multiple specialities, but there is also evidence that sub-specialist teams offer increased benefits such as those focused on the emergency department and older people (23) .

Maternity and consultant led obstetric services may benefit less from co-located specialist mental health services, and although there is a clear benefit in having rapid access to advice, the focus and recommendations from Royal Colleges and Department of Health is effective joint working arrangements and services which can respond across primary and secondary care, and clear pathways for accessing specialist beds in mother and baby units where required.

The co-location and integration of services will address the need for parity between physical and mental health care, which is at the heart of the government's mental health strategy.

3.4 Paramedic care and ambulance transport services

The centralisation and co-location of specific specialist services (such as for major trauma, stroke and primary PCI) has delivered clear patient benefit, and has been embraced by paramedics and ambulance services regionally, services that are key to the effective working of these pathways.

However, as potentially more services coalesce, there will be an impact on paramedics and ambulance services, and any decisions to re-design services must consider carefully this impact and how it affects the capability to continue to respond to patients in communities who are distant from centralised specialist clinical services, and indeed how to best utilise the specialised abilities of the NHS ambulance service system. (24–26)

There are four main themes relating to paramedics and ambulance services. Each of these headings summarise the potential impact on, and opportunities for, paramedic and ambulance services if there is increasing centralisation and networking arrangements for acute hospital based services.

Paramedic practice and patient flow

Paramedic practice is developing in a rapid and sustainable way, and paramedics at all levels of practice can have a positive influence on supporting and promoting redesigned services. The following areas can support improvements to localised and centralised acute hospital services:

- Bypass of emergency departments (A&Es) to ambulatory emergency care centres for patients with clear pathology which requires further assessment, monitoring and treatment. Combining enhanced clinical assessment by paramedics and increased direct access to ambulatory care centres can support A&E and admission.
- Planning the time patients are transported for assessment and admission to secondary care by utilising booking systems for ambulatory emergency care and acute medical and surgical assessment units.



- Pre-hospital critical care: Critical care paramedics (CCP) can treat and monitor patients for longer, optimising care on-scene and providing an enhanced journey to the appropriate facility. Ambulance services may require additional capacity to ensure consistent coverage due to these incidents taking longer to complete than normal ones.

Impact and opportunities

Centralising services and localising others can be strongly supported through utilisation of the increased skills and capacity of paramedics. In particular, specialist and advanced paramedics can optimise patient flow into primary, secondary and tertiary care, mitigate demand fluctuations, and promote more strategic movements of patients. (27,28)

Inbound patient transport (including to secondary, tertiary and community facilities)

Building on the previous heading, the increased capability of paramedics and other ambulance clinicians provides greater access to services for patients. Assimilating new ways of working to provide 999 callers with more choice of care facility from scene is a potential benefit of service Redesign. However, consideration must be given to the predicted volumes of patients who must travel further by ambulance, and the level of care required whilst in transit must be understood in order for workforce planning to reflect need. There are a range of opportunities which accompany Redesign in relation to the inbound flow for patients.

- Improved 'booking' opportunities for accepted patients which support the model of ambulatory emergency care pathways
- Enhanced clinical decision making support from within the ambulance service and from specialist services, and remote support for clinicians at the patients' side to facilitate access to such specialty advice.
- Increase the range of entry points into urgent and emergency care beyond just the emergency department.
- Enhancing the provision of services to patients with mental health needs, supporting the Parity of Esteem principles.

Impact and opportunities

Ambulatory emergency care and innovative ways of booking patients into appointments/clinics are key opportunities that could help offset the impact of increased journey times, and the increased volume of these journeys. Designing better access to healthcare services, at a time most convenient to patients, which is efficient for providers 24/7, and opening up inbound patient pathways which have been previously inaccessible to paramedics is an important consideration when re-designing services. (29–31)

Inter-facility transport

Changes to the geographical location of services resulting from centralisation or new network arrangements between hospitals, must consider the inter-facility transfers which are likely to increase for both planned and urgent care patients. Stepping patients up and down within the network is a natural consequence of the centralisation of services, as well as moving patients between facilities of similar levels. The use of CCPs to support the network should be considered,



as should utilising the ambulance services to support training and education for clinicians undertaking transfers. (30,31)

Impact and opportunities

Any increase in inter-facility transfers must be considered in the design phase of planning changes in service locations. The limiting factors of resource availability and skill set must be considered, as mitigations to reduce these will prevent unnecessary delays in patient movement.

There is an opportunity to develop improved awareness of how busy services are, and allow ambulance services to work to capacity management systems to even out patient movements, which can in turn increase efficiency and effectiveness.(29–31)

Outbound transport (supporting patient flow and discharge planning)

Patient transport services (PTS) are vital in the effective management of systems. Ensuring that patients can be discharged home and/or moved to centres for rehabilitation is essential in preventing blockages and Reduction in patient flow, and must be considered as intrinsic to the overall system. For those patients who arrive in a care facility, many will require subsequent onward transfers to other sites – even within an optimised services model. PTS promotes patient flow at the end of the spell and can assist with:

- Supporting the four hour target – enabling admission avoidance for patients breeching due to transport delays.
- Discharge planning to rehabilitation and step-down centres - enhanced care in transit for recently disabled patients, and support for discharge to assess initiatives.

Impact and opportunities

Similar to the impact on inbound patient movements, outbound flow will increase, and the impact of this extends beyond organisational pressures to that of patient comfort and experience. Highly skilled PTS staff with modern vehicles and equipment can enhance the whole care pathway by ensuring that transport is considered intrinsic to high quality, effective and efficient care. (29–31)

3.5 Imaging (radiology) services

The role of imaging has changed dramatically in recent times with increasing reliance on all modalities for primary diagnosis and guiding management. This is reflected in the steady increase in the use of more complex modalities as part of the ‘routine’ work up of patients across all specialities – instead of being used, more historically, for problem solving in a small sub-group of patients. This is driven by many factors, including evidence supporting the use of early CT scans as best practice in the acute surgical take rather than diagnostic laparotomy. There is also evidence for some modalities e.g. MRI, that scanning rates need to increase further to optimise patient management. Thus for many acute specialities it is essential that there is either immediate on-site access to CT and MRI, or access is required within 24hr.

Interventional radiology is becoming an intrinsic part of modern medical and surgical management. Whilst for some specialities access within 24hr or on a networked basis is appropriate it is



essential to have immediate access for certain specialities, especially vascular surgery 'hub' centres, and major trauma centres.

It is appropriate for highly specialised or smaller volume imaging services, such as cardiac MRI and nuclear medicine that these can only realistically be delivered on a network basis.

There is a potential separation between the staff and hardware needed for 'image acquisition' (doing the scan) and the staff needed to report the scan, resulting from the ability to transmit images to other remote sites for the reporting. This allows increased efficiency and rapid access to expert opinions, but ideally the reporting should be undertaken by staff employed locally and within the NHS for optimal clinical governance.

In the short and mid-term there are some practical issues that mean it is impracticable, or financially challenging, to deliver 24 hour access to certain services at all sites, especially in light of inadequate numbers of appropriately trained and skilled staff, and so a networked solution for rapid or immediate access will continue to be required for a small numbers patients. However, it is likely that further increasing clinical demand will require increasing 7/7 and where necessary 24/7 services on hospital sites.

3.6 Teaching, training and research: the key issues in relation to service reconfiguration¹

This section addresses some of the threats and opportunities in this domain, with a view to defining some areas where further planning and dialogue are required.

The identification of critical issues that need to be considered in the context of service Redesign is a vital part of the process of finding appropriate strategies to ensure that we neither damage existing effective structures and processes, nor cause medium- or longer-term problems in relation to teaching, training or research.

The wider context

There are a number of key contextual factors:

- A recent NIHR survey indicated that 89% patients were willing in principle to participate in clinical research, demonstrated by a number of recent surveys: (32)
- Research activity under the auspices of the NIHR has increased greatly over the last 5 years. For example 600,000 patients were recruited into clinical trials last year in Kent Surrey and Sussex (KSS-CRN Report 2015) (33), even though it is a relatively low-performing area on a *per capita* basis.
- The UK has an educated and informed population, and there is no reason to suspect that our patients are not keen to engage in research. However, recruitment to trials is very patchy across the country, and from an external perspective the view could certainly be

¹ This section was contributed by Professor Kevin Davies, Chair of Medicine, Brighton and Sussex Medical School



taken that we are failing a significant proportion of our population in many respects, and depriving many of our patients of the opportunity to be treated with novel therapies

- There are 33 undergraduate medical schools in the UK, but the geographic distribution is very uneven (34). Many, but not all, are found in and around large urban centres, and are well-established. The newer schools, founded in the last 15 years, are relatively small in terms of student numbers and faculty, but are in the main highly successful from the perspective of teaching delivery (e.g. Brighton and Sussex Medical School has a 96% student satisfaction). However, they are still in many respects immature organisations from a research perspective.
- There is an evolving relationship between city-focused former deaneries and their peripheral neighbours as part of the current re-organisation of postgraduate educational structures across the country, particularly in relationship to postgraduate specialist medical training. In many specialities there is a wish to have more locally or regionally focused training programmes, but the success of any such programmes is highly predicated upon its ability to deliver the full range of clinical training opportunities within the relevant patch.

Undergraduate issues

It is essential that medical schools be included as stakeholders in any discussions regarding service delivery. The success of UK undergraduate medical education reflects the commitment and enthusiasm of clinical teachers not only in the schools themselves, but also in many partner trusts and primary care (35). Significant extra NHS funding supports undergraduate teaching. The curriculum needs to stay fit for purpose to produce doctors with the appropriate skills to practise in the modern NHS, as it is clear that patient care in the future will be delivered in different environments in hospitals, integrated care facilities and the community, by a multi-professional team.

Any service change should include an impact assessment on teaching and learning for both undergraduate and postgraduate trainees, and a commitment from healthcare commissioners and providers to delivering high quality teaching and learning opportunities.

The GMC will be looking closely at teaching provision in Local Education Provider sites in its upcoming review of undergraduate and postgraduate education and training in 2015, with a focus on quality assurance mechanisms. It is therefore desirable that undergraduate and postgraduate education representatives contribute to the relevant stakeholder committees at all levels to highlight how service changes could affect ability to deliver high quality teaching and training. This will also have the added benefit of demonstrating clinical and educational collaboration and could lead to innovation in teaching and training delivery, as new educational opportunities arise as a result of care being delivered in novel ways in different settings. The danger is that service change occurs in isolation from education, leading to a disconnect in expectations of staff and students, with resulting poor experience and feedback, which will be policed closely by the GMC and other regulators.

There are many potential threats to the coherence of undergraduate medical education in this regard. One local example to make the point is that of Brighton and Sussex Medical School. Much of its popularity and success relates to its teaching in the clinical domain of various specialist services, such as in cancer, infectious diseases, HIV and sexual health, musculoskeletal medicine,



dermatology, elderly care and acute medicine, and these constitute unique selling points for the school. While a significant proportion of this teaching is delivered at the base hospital in Brighton, the school does make use of many of its partner hospitals within the region. However, the increasing fragmentation of services and providers, in for example HIV and sexual health medicine, dermatology, and rheumatology, risks jeopardising the delivery of high quality teaching in these specialties. This in turn would risks being unable to satisfy the requirements of GMC recognition (there will be much tighter external regulation, and additional national examinations soon), and could also mean a resultant in loss of SIFT funding (always under threat) to all hospitals in the region currently involved in delivering the curriculum.

There are similar risks if there are major changes to where core services such as acute medicine or acute surgical services are delivered. If the consequences for student experience and quality of teaching are not understood and agreed with medical schools, then funding may be withdrawn to enable alternative clinical exposure and teaching provision, which would have significant negative impacts on affected trusts.

Postgraduate issues

In many specialities there has been an intention to 'repatriate' specialty medical training rotations into the regions from the major urban centres. However there has long been a recognition that in the absence of, for example, bone marrow transplantation (in a haematology training scheme) or renal transplantation (in a nephrology training scheme), a regional scheme would be unable to provide the full range of clinical exposure in those specialities. It is the case though that there are likely to be widely available high quality training opportunities in specialties across many different contiguous areas, particularly in the major urban centres. The same considerations apply to the non-medical clinical training schemes. Hospital networks therefore need to take account of the training implications and requirements of specific specialty schemes when looking at reconfigurations.

For a number of specialties, particularly those with a primarily outpatient workload, there are profound risks to training schemes. In musculoskeletal services, for example, regional programmes currently attract good quality trainees, but it is difficult to imagine that any rotation not based specifically around a specialist centre (of which there are relatively few in the country) will be sustainable if the vast majority of the services are delivered in the community, with only very limited secondary and tertiary level activity continuing within the region. Similarly in dermatology, and others, there is a very real possibility that specialty training will not be sustainable in two to three years' time. It is therefore vital that post-graduate training implications are factored in, on a case by case basis, when discussions about service reconfiguration are taking place, and these issues are specifically taken into account in the commissioning processes.

There is increasing enthusiasm for the provision of Masters programmes outside traditional major centres, and for providing postgraduate research posts (e.g. Clinical Fellows), which would generally mainly be filled by specialist trainees (SpRs) doing 'out of programme' activity. But in reality such opportunities (such as NIHR-funded ACFs and Fellows) are very limited outside the immediate penumbra of influence of large established teaching hospitals. The knock-on effect here is that 'peripheral' training schemes (those not based in major conurbations) do not attract and keep the best trainees. Young medical schools and these peripheral centres therefore find it difficult to keep their graduates in training in their region. The long-term adverse implications of this



are obvious - a very patchy distribution of medical expertise and talent developing across the country, with some regions struggling to attract trainees and indeed consultants in a range of specialities.

The rolling out of 'Health Partners' solutions (highly successful in London and elsewhere) more widely, which may facilitate limited investment in clinical training fellows may go some way to addressing these issues, but real NHS investment in clinical research-focused posts (not only medical but on a multi-professional basis) will be required to attract and retain the best staff in many regions in the UK outside urban centres, and where there are no links to an established medical school.

Research

There is a huge variation in the amount and quality of clinical research across different UK regions, reflecting *inter alia* resource issues (physical and financial) and the availability of 'academic' support. In some areas there may be no medical school, or only a relatively small and 'young' one, with no fully active Clinical Research Facility (CRF), Clinical Trials Unit (CTU) or CLAHRC. In other areas there may be a higher education institution (HEI) which, whilst academically strong in other areas, do not have a strong tradition of research in mainstream biomedical research.

The greatest strength in clinical research is nearly always in areas where there is clear academic leadership and often in domains where care is delivered on a 'networked' model, e.g. in cancer medicine. If effective synergies can be developed between university and clinical partners, the benefits are clear and immediate.

At present there is considerable inequity of access for patients to studies, depending on whether their care is delivered by a specialist centre. This applies in many different clinical domains – a patient with even a relatively common, but 'complex' condition, such as rheumatoid arthritis or inflammatory bowel disease, will have a hugely reduced chance of participating in a trial if they live, and are cared for, away from a designated specialist centre.

Fragmentation of clinical services is a major risk to quality clinical research and equality of patient access to it. There are a number of issues which need to be taken into consideration from the research perspective when considering new ways of providing a service. These include:

- Governance and sponsorship: will all providers have systems in place, understand need and be research knowledgeable (let alone research 'willing')?
- In many domains the increase in complexity of patient service delivery *per se*, often multi-professional in nature, will require complex project management to organise and bring teams together to deliver studies.
- Issues around Excess Treatment Costs: where will responsibility lie? This issue is a live one at present, and the answer is far from clear now, but further distribution of delivery will make it even more complex to establish where responsibility lies.
- Follow up of clinical trial patients (even when a study is delivered in a 'central' facility): potentially an added and costly burden, with real issues about information transfer and clinical responsibility.



- Studies that include a review of a patient pathway, particularly across fragmented services are likely to be more complex and potentially present issues for longer term studies. This could impact on the take up of long duration studies as it may not be clear where and how services will be provided in the future. Many studies in for example cancer, diabetes, cardiovascular, renal medicine and rheumatology are long term (1 – 5 years), due to the natural history of the conditions involved.
- AQP/private provider and contractual arrangements: participation in research may well not be on the service provision specification of a new provider, and its omission from service provision contracts (as with teaching and training) may be a factor enabling a potential provider to offer a more financially competitive product. This could be addressed by making becoming 'research ready' a requirement of any new contract. Otherwise patients may be ineligible to participate in studies.
- Small providers may only be contracted to provide the more simple clinical services, with no critical mass to support research. Such a provider could only be involved in research around these restricted services, and it would not be cost-effective for them to put in place the appropriate governance arrangements.
- Industrial collaborations: pharmaceutical companies often need to deliver a study across different sites depending on the clinical domain and stage of study. Industry has a relatively conservative approach to engaging partners to conduct trials so may well not select sites where delivery will need to cross several different providers or a mix of NHS, academic and AQP collaborators. It is already the case that many multi-national trials evaluating new biologic drugs, in rheumatic diseases for instance, are failing to recruit in the UK, and some companies are excluding the UK completely from such studies.

Summary and recommendations

- It is vital that undergraduate teaching, postgraduate training, and research remain high and explicit on the agendas of all stakeholder organisations (commissioners and providers) involved in planning changes in service delivery configurations, and expert representatives from these three areas should be involved in any service change proposal.
- We need to develop effective synergies with the LCRNs, AHSNs, commercial partners and other stakeholders in order to ensure that we optimise research opportunities. Failure to do so is doing a disservice to our patients, current and future.
- If we do not provide sustainable training programmes (across the multi-professional workforce) at a regional level we risk losing our best graduates to centres or programmes in neighbouring regions and urban centres in particular, and in the longer term this will present major workforce challenges throughout the country.
- In the short term, we need to address systematically the provision of research infrastructure at a regional level. This applies to both human factors and physical infrastructure. For example there would certainly be a case for developing clinical research facilities in the stronger of our district and regional hospitals and it seems likely that AHSNs would be supportive of this idea. Resourcing the clinical workforce to undertake research is vital. For example, one London teaching hospital invests 170 PAs (half day sessions) of consultant



time in dedicated research activity, in contrast to some local and regional hospitals who allocate almost none, and one major regional teaching hospital which only allocates the equivalent of two full time consultant posts to research activity.

- There is a strong case for developing the 'Health Partners' models similar to those which have proved so successful in London, and are in embryonic form in other regions. What is self-evident is that to do this in an effective manner would require careful planning, buy-in from all the relevant stakeholder organisations, and above all, clinical 'champions'.



4. The co-dependencies grids

The completed grids are shown on the following pages (and can be found on the SECCS website). It is vital to remember that the services in the columns along the top are for this exercise are considered to be supporting services for those in the rows. What is being described therefore is the nature of the dependency of the row service on the column service. The colour key is shown in section 2.5.1 (and also at the bottom of Grid A).²

Grid A shows all four of the colours/dependencies.

Grid B shows just the Purple dependencies from Grid A (with the Red, Amber and Green dependencies subtracted out). This therefore shows only those services (in the columns) which it was considered should be based on the same site as the acute services in the rows.

Grid C shows both the Purple and Red dependencies from Grid A (with the Amber and Green dependencies subtracted out). These two colours combined therefore show which services (in the columns) were considered should be provided on-site to the acute services in the rows, either by being based on the same site, or by providing an inreach or visiting service to the patient (without transfer).

² Given the fine detail on these grids, they are best reviewed through magnification on screen, or by printing off on A3. They will also be available on www.secsenate.nhs.uk



Grid A. Dependencies of the eleven acute services on other clinical specialties and functions: the complete grid.

Refer to figure 1, the colour key on page 13

[illegible]

Grid B. Dependencies of the eleven acute services on other clinical specialties and functions: services that should be based on the same site (the Purple dependencies). Refer to figure 1, the colour key on page 13

[illegible]

Grid C. Dependencies of the eleven acute services on other clinical specialties and functions: services that should be provided on the same site, either based there (the Purple dependencies) or inreaching (the Red dependencies). Refer to figure 1, the colour key on page 13

[illegible]

5. Grid analysis: emerging requirements of acute hospitals

Whilst the dependencies of each of the eleven main services (in the rows) on other specialties (in the columns) were rated independently, there are indirect dependencies that require services to be together, on the basis that if service A requires co-location with service B, and B requires co-location with C, then C should be co-located with A.

By looking at services connected in this way, it is then possible to describe the core services that should be grouped in the same hospital. This is of particular importance in describing the core clinical services of a hospital providing A&E services. In this section, the grid has been analysed for hospitals hosting the two main kinds of A&E departments. Firstly, those where the department has an unselective 'take', including acute adult surgical presenters. Secondly A&Es that operate a 'selective' take for adult patients that is not set up to receive surgical patients, and where patients with presumed acute surgical problems are conveyed (by ambulances) or referred (by GPs) to a different hospital that does provide an acute surgical service.

Hospitals with Emergency Departments (A&Es) receiving all acute adult patients (an unselective take) need on site acute and general medicine, acute surgery, and critical care (ICU). Therefore such hospitals need to provide the supporting clinical services which are required by all *or any one of* these four core inter-related acute specialties. These amalgamated requirements therefore delineate what an 'emergency hospital' is recommended should be provided on the same site as a minimum. The top four rows of the grids should be considered in that light, and the lists of these inter-related specialties are shown in 5.1 and 5.2 below.

The range of requirements, both direct and indirect, of the more specialist acute services listed in the other grid rows (rows 5-11) is described in further detail in section 6 of this report. Users of this report would need to take account of all the indirect as well as direct dependencies when considering the needs of these other services, and a full analysis of these individual cases is not described in this report, but can be analysed from the grid as required.

5.1 On-site services recommended for hospitals with emergency departments: unselected take (including adult surgical patients)

5.1.1 Services that should be based on-site (Purple-rated dependencies)

- Acute and General Medicine
- Elderly Medicine
- Respiratory Medicine (including bronchoscopy)
- Medical Gastroenterology
- Urgent GI endoscopy (Upper and Lower)



- Cardiology (non-invasive)
- General (Adult) Surgery
- Gynaecology
- Trauma
- Orthopaedics
- Urology
- ENT
- Critical Care (adult): Level 2 and 3
- General Anaesthetics
- X-ray and Diagnostic Ultrasound
- CT Scan
- MRI Scan
- Urgent Diagnostic Haematology and Biochemistry
- Clinical Microbiology/Infection Service
- Occupational Therapy
- Physiotherapy
- Acute Mental Health Services (Liaison Psychiatry)

5.1.2 Additional services that should inreach if not based on-site (Red-rated dependencies)

- Diabetes and Endocrinology
- Rheumatology
- Dermatology
- Acute Oncology
- Palliative Care
- Neurology
- Nephrology
- Maxillo-Facial Surgery
- Plastic Surgery
- Burns
- Interventional Radiology
- Speech and Language
- Dietetics

5.2 On-site services recommended for hospitals with emergency departments: selected take (ambulance bypass of acute adult surgical patients)

In a number of hospital trusts with more than one acute site, only one of those sites may be set up to receive acute surgical patients (i.e. where the acute surgical take is based). Those sites not taking acute adult surgical patients therefore do not require the co-location of services which are only required by acute adult surgery, and not by A&E, the acute medical take, or by critical care.



From the grid, the only services *not* required to be based on the same site (Purple dependencies), compared with unselective A&Es, are urology and ENT.

5.2.1 Services that should be based on-site (Purple-rated dependencies)

- Acute and General Medicine
- Elderly Medicine
- Respiratory Medicine (including bronchoscopy)
- Medical Gastroenterology
- Urgent GI Endoscopy (Upper and Lower)
- Cardiology (non-invasive)
- General (Adult) Surgery
- Gynaecology
- Trauma
- Orthopaedics
- Critical Care (adult): Level 2 and 3
- General Anaesthetics
- X-ray and Diagnostic Ultrasound
- CT Scan
- MRI Scan
- Urgent Diagnostic Haematology and Biochemistry
- Clinical Microbiology/Infection Service
- Occupational Therapy
- Physiotherapy
- Acute Mental Health Services (Liaison Psychiatry)

5.2.2 Additional services that should inreach if not based on-site (Red-rated dependencies)

- Diabetes and Endocrinology
- Rheumatology
- Dermatology
- Acute Oncology
- Palliative Care
- Neurology
- Nephrology
- Urology
- ENT
- Maxillo-Facial Surgery
- Interventional Radiology
- Speech and Language
- Dietetics



6. Service by service commentary

6.1 Emergency Medicine (A&E)

Departments of Emergency Medicine (A&E) are the first point of hospital contact for patients attending hospital in an unplanned (emergency) way – via ambulance conveyance or by self-presentation. A&E services require multi-skilled, multi-professional clinical teams, available 24 hours a day, with the expertise to provide safe triage, rapid diagnosis and appropriate clinical stabilisation or reassurance for all unscheduled attendances, irrespective of age, diagnosis and severity of illness.

To improve the outcomes, including the prevention of death, of patients attending hospital in an unplanned way, a wide range of on-site or instantly available clinical, diagnostic and administrative support is required, as well as immediate access to inpatient beds, ambulatory care pathways, social and psychiatric services.

The co-located services required for a safe and sustainable emergency department include:

Diagnostic services

Pathology, plain radiology and CT scanning – each available 24 hours a day, with immediate reporting, to enable rapid diagnosis for conditions such as acute stroke, the acute abdomen, and major vessel disease (including pulmonary vascular disease). (36–39)

Critical care services

With capacity to treat and prevent poor outcomes (including death) of the small numbers (typically <2%) of A&E attendees that are critically ill. (40,41)

Paediatric expertise

A significant proportion of A&E attenders are children, so the ability to appropriately assess the severity of a child's illness (and thereby avoid child death) is essential. This expertise can be provided within the A&E team itself, or through consultant-led paediatric teams with access to inpatient beds, either on site, or (via robust, networked pathway arrangements) at geographically nearby specialist paediatric units (the model of care in a number of large cities) (42,43).

Acute medicine, including geriatric medicine expertise

To deliver rapid diagnosis, treatment and improved outcomes for adult patients with an acute medical illness. This requires a consultant led acute medicine team working within an AMU +/- a colocated acute frailty assessment unit, 7 days per week, for a minimum of 12 hours per day. It is essential that this team has the capability to undertake comprehensive geriatric assessment (CGA)(38,39).



Acute surgery and acute orthopaedics (on-site or as part of network based support)

To deliver rapid diagnosis, treatment and improved outcomes for adult patients with acute surgical and orthopaedic illness. (39)

Access to inpatient speciality medicine, general surgical and orthopaedic surgical beds.

Approximately 30% of patients attending A&E require onward hospital admission for further investigation or specialist treatment. The attendance to admission conversion rate varies greatly according to the age of the patient - being typically up to 50% in the very elderly or those with multiple co-morbidities. (44)

Liaison Mental Health Services

Readily accessible (within 2 hours) psychiatric expertise helps reduce both admission and re-admission rates in people with mental health problems. (45)

Social Workers

A&E access to social services is of benefit to staff and to patients (including avoidance of unnecessary main hospital admission for selected patients)

6.2 Acute and General Medicine

The Acute medical take (including geriatric medicine) requires an appropriately staffed, multi-professional, acute assessment unit to deliver rapid diagnosis, treatment and improved outcomes for adult patients with acute medical illness. To improve the outcomes (including the prevention of death) of acute, previously unscheduled medical patients admitted to hospital via primary care or following A&E triage, a wide range of immediately accessible clinical, diagnostic and administrative support is required, as well as access to inpatient beds, ambulatory care pathways, social and psychiatric services. This requires a skilled, consultant led acute medicine team working within an acute medical unit (AMU) (+/- a co-located acute frailty assessment unit), 7 days per week, for a minimum of 12 hours per day. It is essential that this team has the capability to undertake comprehensive geriatric assessment (CGA).

An appropriately staffed AMU requires the co-location of respiratory medicine (with the capability to supervise non-invasive ventilation for appropriate patients) and gastroenterology (with the capability to deliver therapeutic upper GI endoscopy for appropriate patients - see below), as well as the other essential services listed below – to deliver safe, sustainable acute medical care to unselected patients admitted on an acute hospital site.

Diagnostic services

Pathology, plain radiology and CT scanning, available 24 hours a day, with immediate reporting, to enable rapid diagnosis & improved outcomes especially for conditions such as acute stroke and the acute abdomen (which may present with alternative or indistinct symptoms in the elderly or immunosuppressed) (36,46).



Critical care services

To safely manage both acutely sick medical admissions and deterioration in existing medical inpatients (47,48).

Endoscopy

Early endoscopy after acute upper gastrointestinal bleeding reduces re-bleeding and the need for surgery (49).

Acute surgery (on-site or as part of network based support)

To enable rapid diagnosis and improved outcomes especially for conditions such as the acute abdomen and obstructed renal tract (which may present with alternative or indistinct symptoms in the elderly or immunosuppressed medical patient) (50).

Geriatric expertise

To provide adequate, immediate, comprehensive geriatric assessment (CGA) and specialist geriatric support to those over 65 (and at any age with frailty and multiple co-morbidity). There is evidence that multi professional CGA within 24 hours of admission Reduces length of stay and improves outcomes in frail elderly patients (9).

Seven day therapy services

To support active rehabilitation and reduce length of stay (1).

Seven day pharmacy services

To reduce drug errors.

Liaison psychiatry accessible (within 2 hours)

Psychiatric expertise helps reduce both admission and re-admission rates in people with mental health problems (23), (and see section 3.3).

A range of other clinical specialities are traditionally regarded as required when providing an acute medical take. Currently, in a majority of acute hospitals in England and Wales, these are co-located on the same site as the emergency department and AMU (and might ideally remain so). However, reconfiguration and centralisation of service provision using a networked arrangement and robust inreach/referral protocols, is currently being reviewed as an option for service provision in a number of acute trusts – for the following medical subspecialties: acute stroke, diabetes and endocrinology, nephrology, rheumatology, dermatology and acute cardiology. Any such networked arrangements require the provision of a safe, extended, skilled and consistent consultant-led acute medicine service 7 days per week.

6.3 Acute Surgical Services (Acute Surgical Take, Trauma and Vascular Surgery): general points

The dependencies given for acute surgical take, trauma and vascular surgery are based on an ideal configuration, which may vary according to local geographical circumstances and hospital availability. They follow College guidance where available, but are designed to reflect the future



needs for 24/7 acute care and to minimise acute hospital transfers to reduce the burden on the acute ambulance services.

The creation of 'specialist (major) emergency centres' as envisaged in the Keogh review (24) may have an effect on both trauma unit and vascular hub co-dependencies as they may be part of the criteria used in defining such centres.

With regard to some of the specific service dependencies, all of these three surgical specialties will need access to specialist acute oncology, as admitted patients who are being treated with chemotherapy for malignancies need advice on the management of this therapy. This could be provided by 24/7 telephone advice from a cancer centre or if needed, an inreach service. All hospitals should have liaison psychiatry rapidly available when required. Palliative care is less acute and should usually be provided within 24 hours. Both these latter two services will become increasingly important with the increasing age of admitted patients, many of whom will have dementia, and may well be entering a time of their life when palliative care is the most appropriate form of treatment. Decision-making in this area could be aided by better pre-emptive end of life planning in the community (such as through advance care planning), but the patients will still require skilled acute management, supporting the medical and surgical teams where appropriate.

6.4 Adult Acute Surgical Take

The co-dependencies of the adult acute surgical take will necessitate an on-site A&E department to allow appropriate investigations and triage to occur, and will also necessitate appropriate medical back up from both acute and general medicine and, as a large proportion of patients are elderly, the elderly medicine department.

In order to cover patients with gastrointestinal bleeding, on-site gastrointestinal advice should be available together with facilities for urgent endoscopy. Respiratory medicine, including bronchoscopy, should be available. Immediate diabetes advice could usually be provided via the acute and general medicine route, with specialist advice available on a networked basis and has a lesser co-dependency.

As elderly patients often have cardiovascular co-morbidities and are potentially stressed by their acute surgical conditions, and often require anaesthesia for their management, acute cardiology services should be available for advice.

Diagnostic investigations that are required on-site include routine X-ray and ultrasound, CT and MRI, with access to nuclear medicine which could be networked. Much surgical intervention is now performed in a less invasive manner using interventional radiology, and this trend is set to increase with time. The service must be available for patients, but although ideally provided on-site to save transfer of patients, the service could again be networked with adequate out-of-hours inreach, or patient transfer protocols.

Many laboratory investigations can be centralised providing specimens are transported rapidly and there are good IT links to results. However the acuity of patients requires an on-site hot lab and near patient testing, giving this a Purple rating. Clinical advice at the bedside is required for a



Clinical Microbiology and Infection service, which could be on a visiting basis. Blood products should of course be readily available for transfusion.

Occupational therapy and physiotherapy should be available 7/7 for patients, and deliver continuity of care. Acute mental health services should be rapidly available to patients when required, and if based off site, should be able to respond within four hours (50)(51)(52).

Adult acute surgery needs to have plastic surgery available on-site, inreaching if necessary to perform such surgery on-site rather than having to transfer the patient. A small number of patients will have significant abdominal wound breakdown which requires early plastic surgery input (e.g. to skin graft their abdomen) as well as the potential for combined input later. Certain cases of soft tissue infection like necrotising fasciitis are often managed by general surgeons, and it is most appropriate for a plastic surgeon to be involved as soon as possible to help with the surgery knowing that transfer of the patient may not be possible for quite some time.

6.5 Trauma

Trauma services in England were reorganised into regional trauma networks in attempt to save an estimated 450 to 600 lives per year by ensuring rapid treatment. This system went live in April 2012 and is based upon a network with a major trauma centre (MTC) serving a population of 2 to 3 million. The centre provides a comprehensive state of the art service for patients suffering major trauma and is supported by the ambulance service triaging patients who may bypass local hospitals to gain faster access to specialist skills for instance following a head injury. The MTC is also supported by more local trauma units (TUs) which can offer treatment for the less seriously injured patient and a 'treat and transfer' service following resuscitation and a step down facility to enable a more local recovery after treatment in the MTC.

Major trauma centres (MTC)

The specifications for a MTC are well described in the 2010 NHS Clinical Advisory Group report (53) and is laid out in the NHS England standard contract for major trauma services (54) . They have the widest range of co-location requirements to cater for the wide range of injuries, pathologies and complications that can arise.

A MTC should have immediate access to the vast majority of acute services which would include the surgical specialties and most of the medical specialties. Providing that adequate orthopaedics input is provided by the trauma team, it may also be possible for orthopaedics to be provided as an inreach service rather than as a required co-located service, although with sub-specialisation in orthopaedics, it would be preferable for it to be co-located so that there is immediate access for instance to specialised foot and ankle services. Certainly if spinal injury services are provided by orthopaedics rather than trauma, it should be a co-located service.

A full range of investigations should be available on-site (although on-site cardiac MRI is not an absolute necessity).

Trauma Units (TU)

The specifications for TUs are less rigorous than for a MTC. The NHS Clinical Advisory Group 2010 (53) 'recognised that the selection of MTCs and TUs will be affected by geography, traditional



referral pathways and the existing distribution of services between hospitals. Some TUs may be more distant from an MTC. These units will need to be prepared to accept and stabilise some severely injured patients who in other circumstances would have been transferred directly to an MTC.' It is possible in the future that as and when the specialist emergency centres envisaged in the Urgent and Emergency Care Review take shape, the configuration of such hospitals would enable a significantly enhanced trauma service.

Orthopaedics input in a TU could be completely provided by specialised trauma surgeons, but again it is more likely that orthopaedics inreach services will be needed. Within a TU, vascular surgery input will be required but this could be provided by inreach services, as in the management of limb fractures with resulting ischaemia, providing this inreach service is timely (within an hour), and has appropriate supporting diagnostic and theatre services, thus preventing the need of a transfer to a vascular surgery hub of an ill or acutely injured patient. Simple compound fractures which at present are treated in a MTC, could be treated in enhanced TUs providing appropriate plastic surgery inreach services are available.

Care of head injury patients in a TU may either be provided by neurology or by the stroke team. This would include rehabilitation.

Acute paediatrics does need to be co-located with the TU as patients will require joint surgical and paediatric care.

6.6 Vascular Surgery

In an attempt to provide equal high quality patient access to both elective and emergency vascular services the Vascular Society of Great Britain and Ireland suggested that these services should be available within 1 hours travel time of a recognised vascular centre thus negating the need for emergency vascular care from General surgeons who do not have a specialised elective vascular practice.

Such a service can be centralized or provided by a modern clinical network model with a central hub unit and peripheral spoke units the exact model depending on density of population and local factors such as geography and supporting services such as interventional radiology and intensive care facilities. The spoke units can also provide both excellent local outpatient and rehabilitation services and back up diagnostic services. Networks should be designed to treat a population of 800,000 or more to ensure adequate experience for the network teams in the emergency setting.

Vascular Surgery Hub

Hubs should co-locate with A&Es and therefore all of A&E's direct and indirect dependencies (as listed above), together with interventional radiology and renal dialysis. If not based on the same site, a wide range of medical and surgical services should be able to inreach (Red ratings) to provide on-site management of patients without requiring transfer.

Although the absolute co-dependencies of a vascular surgery hub are primarily related to the availability of critical care and radiological imaging and intervention, with supporting specialised anaesthesia, it is considered appropriate to co-locate a vascular surgery hub at a hospital that had an A&E department, acute surgical take and at least a trauma unit (55)(56). This would



significantly reduce the number of patients that would have to be transferred and would ensure that time critical ischaemic problems could be managed on a streamlined pathway.

Therefore a vascular surgery hub's requirements include those of these related services (see section 5). It was also considered important and relevant that interventional cardiology, along with interventional radiology, were co-located. The national specialist services specifications for vascular surgery provide further recommendations on co-locations and 'inter-dependencies' that are consistent with our conclusions (NHS standard contract for specialised vascular services).

Vascular Surgery Spoke

Spoke units, although mostly transferring acutely ill patients to their networked hubs and generally caring for patients of lesser acuity, still need co-location with an ITU, general surgery and anaesthetics, and access to on-site interventional radiology, even if not an out of hours service.

To a large extent, the needs of this service would depend upon the structure of the hub and the co-dependencies would be much more variable, depending upon both the proximity of the hub and the amount of vascular surgery (assumed to be day case) that is actually done at the spoke. The availability to perform non-urgent angiography and angioplasty and vascular investigations should exist at the spoke, reducing the need for transfer of patients for investigations and ensuring care is delivered closer to home. It is unlikely that the hub will be able to cope with all the angiographic investigations for the volume of patients that hub would have to cover, but the acuity of the investigations would mean that timing was not critical.

There would be a need for general surgery or orthopaedics input for patients at the spoke both to aid in triage before referral to the hub and to perform, for example, simple foot debridement surgery under the guidance of the vascular surgery team.

One of the key features at the spoke will be joint working. It is envisaged that a vascular presence will be available between 3 to 5 days per week. This would enable inpatient referrals to be seen within 48 hours. Access to investigations should include CT, MR angiography and interventional radiology for selected cases. MDT working should encompass diabetic foot services which should include a diabetologist or a physician with a special interest in diabetes and dedicated surgical input by orthopaedic or general surgeons (57)(58). This would be for the emergency treatment of foot sepsis and minor amputations which could be performed at the spoke site rather than transfer to the hub. Vascular surgical input would of course be required (59) (60).

6.7 Adult Critical Care

The following summary is designed to be applicable to any adult intensive care unit (ICU) in an acute general hospital. It encompasses all areas that provide Level 2 (high dependency) and/or Level 3 (intensive care) care as defined by the Intensive Care Society (61), and does not include any recommendations for paediatric patients.

In undertaking this review of the dependencies of critical care units, it was clear that little hard evidence is available to refer to. Such units are more often reviewed as supporting services for other acute specialties, rather than focussing on and describing a critical care unit's requirements. Most of the grid ratings are therefore based on the expert opinions of the members of the regional



Critical Care Operational Delivery Networks, specialist society recommendations (62), and through consensus at the SECCS summit.

Most of these patients by definition are extremely ill and may not be able tolerate any kind of transfer out to another facility. In planning services, great care should be taken to make sure that the specialities these patients need are available on-site wherever possible, without the requirement to transfer patients out.

For on site dependencies (Purple or Red), there were two key references. The European Society of Intensive Care Medicine (ESICM) recommendations on basic intensive care requirements forms the basis on which the recommendation that acute medical, surgical, diagnostic, anaesthetic and radiology services should be co-located(63). The Intensive Care Society of the UK core standards (62) provides clear guidance regarding the provision of rehabilitation services, speech and language, physiotherapy, pharmacy and dietetics on-site.

ENT should be able to attend urgently because some of these patients require access to an urgent tracheostomy service where the surgeon will have to travel to the patient. It was considered unrealistic to have an ENT service in each and every hospital with an ICU, and some hospitals (e.g. in Kent) have the ENT service provided on an inreach basis without any known issues. Gynaecology, interventional radiology and urology should be configured to at least provide an inreach service. Some of the patients that may require these services may be suffering severe sepsis. According to the Surviving Sepsis guidelines source control should be achieved within 12 hours, again this may not be realistic in all hospitals (64)

A significant proportion of ICU patients are elderly, and can benefit from the on-site input of the elderly medicine service. acute cardiology should be available in the same hospital, except for patients requiring urgent PCI who would need to transfer to an appropriate centre if not co-located. It was again considered unrealistic to have a 24/7 PCI on-site facility for every ICU. MRI scanning should be available in the same hospital for ICU patients, given the risks and challenges of transferring patients on ventilators and other life-sustaining treatments.

Other services were considered suitable for off site networked arrangements, including hub vascular surgery, plastic surgery, burns, hyper-acute stroke unit, inpatient dialysis, cardiac MRI, nuclear medicine and occupational therapy. For neurosurgery, cardiac and thoracic surgery, although some ICU patients may require these urgent surgical interventions (e.g. for evacuation a haematoma or drainage of an abscess), these services cannot be realistically provided in each and every hospital.

6.8 Acute Cardiac Services: Cardiology (non-interventional and interventional) and Cardiac Surgery

There is no hard clinical evidence outlining needs for co-location of supporting clinical services with cardiac services. The only previous similar work to this that has been published is The NHS London Health Programmes Cardiovascular Services: Co-dependencies framework 2010 (11) which was put together by consensus from an expert panel due to the lack of clinical evidence on the subject. There are also now the NHS England service specifications which are published for a range of cardiac services, which do include some recommendations for co-locations and inter-



dependencies, (65) (66). Consensus opinion from the Cardiac Clinical Advisory Group a subgroup of The South East Coast Cardiovascular Strategic Clinical Network has led to the ratings shown, taking these in to account.

It was decided by The Cardiac Clinical Advisory Group to subdivide the cardiology inpatient services depending on which interventional procedures are provided, as this has a great potential impact on the need for critical co-dependent services.

Some of the major discussion points and eventual decisions made were based on clinical and practical common sense and the review of existing cardiac services across the country, because of the lack of evidence available in this area. It was noted that there are several major cardiology centres across the country that lack many of the critical co-dependencies considered here but they still have excellent patient outcomes and are considered world class centres of excellence.

It was felt by the Cardiac Clinical Advisory Group that the co-location of acute cardiology was often more essential to support other acute medical and surgical specialities than vice versa.

Although many speciality services were not considered critical to be co-located it would be desirable to have them co-located with interventional cardiology if you were designing a major emergency centre from scratch. These included vascular surgery, interventional radiology, respiratory medicine, gastroenterology with upper gastrointestinal endoscopy and diabetic services.

For cardiology centres offering interventions for structural heart disease such as TAVI, MitraClip and PFO closure devices, vascular surgery was rated as purple because of the high risk of vascular complications from these procedures. It was strongly debated but many people also felt that cardiac surgery should be co-located but overall consensus was for Red within four hours.

Services were rated Green where it was considered most likely that an opinion or treatment could be sought in an elective manner or where that service is so specialised that it would not be appropriate or necessary to co-locate or require a formal network arrangement.

It is noted here that all the ratings are for inpatient adult cardiology and cardiac surgery patients and no discussions were had for outpatient or paediatric patients

6.9 Stroke Services: Hyper-acute and Acute

The National Stroke Strategy (67) provided the foundation for stroke care delivery by defining what was needed to create the most effective stroke services in England. The whole pathway approach, from prevention through to support for those who have had a stroke, is crucial to delivery of the most favourable outcome for patients, including their quality of life and experience of stroke services.

Through high quality research, stroke care has dramatically improved with the provision of stroke units, thrombolysis, specialist care in the community through early supported discharge and with major advances in primary and secondary prevention. A number of sources defining the standards have been used to cover the management of stroke from the acute event through to longer term care. These include the fourth edition of the National Clinical Guidelines for Stroke (68), the NICE



Rehabilitation Guidelines for Stroke (69), the Sentinel Stroke National Audit Programme (70) and the Scottish Intercollegiate Guidelines Network and Scottish Stroke Care Standards (71,72). BASP service standards 2014 (73).

The distinction between hyper acute (HASU) and acute stroke services (ASU) evolved to improve the process of care and the availability of specialist services 24/7. The aim was to standardise the process of care and reduce inequity between providers. There are key national standards to which a stroke service should adhere and a local clearly defined pathway of care should be available (73).

Hyper-Acute Stroke Units (HASU)

All suspected acute stroke patients must be assessed and treated at a HASU by a consultant led stroke team with specialist skills supported by immediate neuro-radiological facilities and expertise (74). There must be an agreed pre-admission protocol between appropriately trained emergency medical services and the HASU with algorithms on dispatch time, assessment, transport strategies and pre-notification (75). This is to facilitate the rapid diagnosis of stroke, to exclude other pathologies and to ensure appropriate immediate intervention (e.g. IV re-canalisation therapy with rtPA). A hyper-acute stroke service has an established thrombolysis pathway. Time from hospital arrival to treatment should be within 60 minutes for in license use.(73). Access to appropriate numbers of highly skilled multidisciplinary workers is paramount to the definition of a hyper-acute stroke service.

It is envisaged that patients will spend less than 72 hours on the HASU before discharge home or further inpatient care and rehabilitation upon an ASU. All immediate investigations and treatment for the acute neurovascular insult should be under taken whilst upon the HASU. Secondary prevention (including carotid artery intervention) and rehabilitation should be commenced whilst on the HASU. Patients should have symptomatically significantly stenotic carotid artery disease excluded whilst at the HASU and those who are found to have a significant stenosis receive urgent intervention (<48hrs from diagnosis) at a vascular hub which need not be co-located.

Multidisciplinary assessments should be started by a least one of the therapists of the multidisciplinary therapy team within 24 hours of admission (68). Nursing levels require a minimum of fully qualified and stroke-experienced nursing staff to manage the acute stroke patient (2.9 WTE nurses per bed; 80:20% trained to untrained staffing ratio) (73).

Support from neurologists, interventional neuroradiologists (capable of intervening upon the intra- and extra-cerebral vessels) and neurosurgeons needs to be coordinated with the hyper-acute centre to enable focused assessment and treatment in a timely and responsive manner. Protocols and pathways for neurosurgical intervention in acute stroke need to be in place through agreement with local and/or regional providers of neurosurgical services, not least to avoid ambiguity and inconsistencies in the management of individual emergency cases. However they do not need to be based in the same hospital as the HASU. Regular review of individual cases should occur to ensure these pathways are functioning appropriately.

Examples of where neurosurgical intervention may be required in acute stroke are:

- Selective patients should be considered for surgical intervention following primary intracerebral haemorrhage if hydrocephalus is present or rapid deterioration occurs



- Patients with malignant middle cerebral artery territory infarction should be considered for decompressive hemicraniectomy within 48 hours of onset if they satisfy the NICE Stroke Guidelines criteria (73).

Acute Stroke Units (ASU)

Patients should be transferred to an ASU once initial assessment, including advanced neuroimaging and treatment is complete. The diagnosis is likely to have been confirmed before transfer as will much of the neuroimaging be complete.

ASUs will require access to similar specialist multidisciplinary services as a HASU and the dependency of patients is likely to be higher than upon a HASU: a nursing ratio of 1.2 WTE nurses per bed is appropriate (73). Complications following initial treatment or as a sequel of the underlying neurovascular disease process may well not develop until the patient is on the ASU. These units, therefore must be able to deal with the whole spectrum of complications of stroke disease in an immediate and appropriate manner (e.g. GI bleed, DVT and PE, myocardial infarction).

All patients should be managed on an ASU unless other conditions requiring immediate specialist care dominate (e.g. the need for ITU, cardiothoracic surgery, dialysis).

The target is for more than 90% of patients with stroke to be admitted directly from home or the Emergency Department to a HASU or an ASU, and to spend at least 90% of their length of stay in a specialist stroke bed (68). The Stroke Unit MDT (to include specialist nurses, occupational therapist, physiotherapist, speech and language therapist, dietician, social worker, psychology services, etc.) holds at least weekly structured meetings to discuss progress and plan goals for acute stroke patients as well as timely and appropriate transfers of care (73).

6.10 Renal Services

Renal grid row: Renal Services Inpatient Hubs (renal grid row)

There is no hard evidence outlining needs for co-location of services to support renal centres, but common-sense and consensus has led to the ratings as laid out. The biggest areas of discussion were in Red vs Amber ratings (inreach of supporting services vs. transfer of the patient from the renal centre to another hospital). For renal dialysis patients, where a supporting service is not co-located, e.g. trauma, hyper-acute stroke unit, plastic surgery, it may sometimes be necessary for the renal replacement therapy to be delivered on an ICU rather than by an inpatient dialysis unit but where numbers are relatively low it was not felt that co-locating these services 'just in case' could be justified.

Renal units should have critical care units on the same site, and should co-locate with interventional radiology, and with vascular surgery hubs (and therefore its associated requirements: see grid and 6.6)

Renal and urology inpatient services are closely linked clinically and it would be usual for a renal hub to have significant on-site urology support. Whilst it was not considered essential that both services were based on the same site, there are risks that access to the urology service becomes



less well coordinated and intervention less timely in patients who need urgent intervention. Renal unit requirements include the ability to provide bladder catheterisation where specialist urology skills are required, and acute urological surgery, e.g. for retrograde stenting. Without co-location, there are significant risks to timely access to emergency operating lists.

Services were rated Green where it was considered most likely that an opinion or treatment could be sought in an elective manner or where that service is so specialised that it would not be appropriate or necessary to co-locate or require a formal network arrangement, e.g. neurosurgery and cardiothoracic surgery.

Renal grid column: Nephrology

This is defined as the ability for an inpatient to be reviewed by a nephrologist. For the majority of the defined main acute services (the rows) this is something that should be provided on-site. On-site direct review in person has significant advantages, including more accurate and detailed assessment than is possible by phone. This can both result in more prompt transfers if needed to a specialist renal service, better management of acute kidney injury (AKI) on-site, and the avoidance of patient transfer, if a detailed specialist assessment obviates the need. For this reason many of the grid ratings for this column are Red. The ideal response time is not clear, but a 48 hour time window may be appropriate where there is ready access to telephone advice in the interim. There is some evidence that recovery from AKI is improved with more intense input from a nephrology service although this can only be supposition when comparing hospitals with on-site vs. off-site nephrology review. The availability of telephone consultation would render this as an Amber rated service

Renal grid column: Inpatient Dialysis

This is renal dialysis delivered by a renal team, as opposed to renal replacement therapy delivered on an ICU. As nearly all the defined main acute services will have ICUs on-site, emergency renal replacement therapy (using continuous haemodiafiltration) can take place in the patient's hospital, even in the absence of a dedicated dialysis service. Patients with single organ (kidney) failure needing dialysis can usually be transferred to a renal centre through a networked (Amber) arrangement, ideally following inpatient review by a nephrologist, as above.

6.11 Consultant-led Obstetric Services

Evidence base

The opinion provided for co-dependencies of consultant led obstetric services is based upon two key documents and a number of more specialised publications which are referenced within the two key documents. Experienced midwives and consultant obstetricians were also consulted. The first key document is the RCOG publication, 'Reconfiguration of women's services in the UK (Good Practice No.15)' (76) which describes the principles that should be adhered to during the planning and process of reconfiguring women's health services. The second is the Sussex CCGs' document on the clinical case for change for intra-partum and inpatient paediatric services (77) which represents the opinions of senior midwives and obstetricians from the whole of Sussex.



Services that should be co-located (based) in same hospital

There was a clear consensus about most of the services in this category. These were general anaesthetics, adult critical care, neonatology, urgent diagnostic haematology and biochemistry, and transfusion and blood bank.

There was some debate about X-ray facilities, but as this is an essential requirement for neonatology it will be *de facto* co-located. Obstetric ultrasound 24/7 can be delivered by clinicians as happens now out of hours.

An anaesthetist of appropriate seniority and experience, with appropriate operating department practitioner (ODP) support, should be on duty in an obstetric unit 24 hours a day. Pain relief should be made available to women who want it and obstetric units must be able to provide regional anaesthesia on request at all times. There should be timely referral to doctors for women choosing epidural analgesia. The anaesthetic team's response time is crucial during emergencies and appropriate planning is needed to manage the response to elective procedures and to detect postoperative complications.

Occasionally women become critically ill during their admission to a consultant led obstetric unit. Arrangements should include defined escalation arrangements for bringing critical care, midwifery and obstetric competencies into the maternity or critical care unit. These arrangements also need to take into account local configuration, size and complexity of maternity and critical care services (76)

Models may include:

- a suitable high-dependency area and equipment with medical input from anaesthetists and obstetricians, staffed by a team of midwives who have the necessary critical care competencies
- local multidisciplinary arrangements with appropriate escalation protocols should level 3 care be required
- appropriate arrangements with local critical care services for collaboration on the delivery suite
- Transferring women to a general level 2 unit with local arrangements for providing obstetric and midwifery input and maintaining direct contact with local arrangements for providing obstetric and midwifery input and maintaining direct contact with their baby

Obstetric services should be co-located with the appropriate neonatal capability to care for preterm or ill babies. The capability of the neonatal unit will determine the case mix the consultant led obstetric unit can manage. In-utero transfer should be the aim when the neonatal service cannot care for the more extreme preterm baby. A neonatal retrieval service should be place for ex-utero transfers.

Major bleeding complications, sepsis and pre-eclampsia are relative common in obstetrics and require co-location of laboratory services providing emergency haematological and biochemical analyses and blood transfusion.



Services that should come to patient (patient transfer not appropriate), but could be provided by visiting/inreach from another site (either physically, or via telemedicine links).

Although laboratory services providing emergency haematological and biochemical analyses and blood transfusion should be co-located, consultant advice in microbiology and haematology could be configured as an inreach service.

The medical specialities identified as needing to be provided on-site were classified in the knowledge that pregnancies are getting more complex. There is a need for enhanced multidisciplinary team working in maternity services and this should include the availability of obstetric physicians to deal with a range of maternal morbidities and comorbidities. Arrangements should be made for adequate cover at all times. Given the acute nature of medical and possible concurrent obstetric complications a four hour referral to consultation window is usually required.

The surgical specialities identified as needing to be provided on-site were classified in the knowledge that every obstetric service must have close access to surgical backup for infrequent complications occurring during childbirth, which include damage to bladder, bowel or major blood vessels. This does not necessarily require co-location of an acute surgery service but it does require arrangements to be in place for 24/7/365 on call availability. There are various models by which this could be achieved, including inreach provision from a nearby acute surgical service, or surgeons providing elective (cold) surgery on the same site also providing 24/7/365 on call surgical cover.

Major bleeding complications may need recourse to interventional radiology (IR). There was discussion about two possible models, either transfer for IR or IR inreach. Much of the use of IR in obstetrics is elective allowing transfer but an emergency inreach service is desirable although very rarely required.

Perinatal mental health problems can occur concurrently with obstetric problems particularly peripartum and therefore transfer out is not always an option. An inreach service should therefore be available. There is a clear benefit in having rapid access to advice, and assessment. The Royal Colleges and Department of Health recommend effective joint working arrangements and services which can respond across primary and secondary care with clear pathways for accessing specialist beds in mother and baby units where required.

6.12 Acute Paediatrics and Paediatric Surgery

Evidence base and background

The UK now has amongst the worst perinatal, neonatal and childhood mortality statistics in Europe. Approximately 5 children die every day that would not if they lived in those countries amongst the best statistics, in Scandinavia for example (42). The Royal College of Paediatrics and Child Health have identified the need to reconfigure health services for children and young people in order to improve their health, quality of life and life expectancy (78). The following are identified needs of the service:

- To improve our ability to identify the sick child and respond swiftly.



- Staff in general practice to be familiar with the clinical assessment of an unwell child, the use of clinical pathways for commonly presenting conditions and how to seek advice from consultant paediatricians.
- Community children's nursing teams to support general practices, children and their families at home and at school, helping improve disease control for those with long term conditions, avoiding hospital attendance and admission when possible and reducing length of stay when this is necessary.
- Locally available short stay paediatric assessment units to receive, assess, treat and monitor children, returning them to home with appropriate support or to refer them promptly to an inpatient unit or specialist service.
- To improve our ability to look after the most unwell children effectively. Only the most unwell children should need to attend and be admitted to hospital. We need to ensure that these children have access to healthcare professionals, who work in teams, with the essential skill and experience to look after them effectively and without delay.

Part of the solution lies in developing fewer, larger inpatient paediatric and paediatric surgery departments, thereby improving workforce resource, skill and experience 24/7, seven days a week. It also affords an opportunity to cohort essential services together.

The case for change is set out in RCPCH documents such as 'Modelling the Future' (79) and 'Facing the Future' (80). This latter document sets out 10 essential standards that any inpatient paediatric department should aim to meet. Standards for neonatal medicine are set out in the DH 'Toolkit for Neonatal Services' (81). Standards for paediatric surgery are described in the NCEPOD document 'Are We There Yet?' (82). 'Standards for Children and Young People in Emergency Care Settings' (83) is an intercollegiate document led by the RCPCH which details standards which should be met by any provider of emergency care.

The DH 'Commissioning Safe and Sustainable Services' (84) described in detail the matrix of co-dependencies for specialised children's services and is helpful for providers of these services. Similarly, the national Clinical Reference Groups have set out clear service specifications for all specialised children's services, many of which include reference to essential access to related or supporting services.

Co-dependencies

None of the documents referred to above describe the essential co-dependencies of more general (as opposed to specialist) acute paediatric and paediatric surgery services necessary to support unwell children and young people. The matrix developed in this project seeks to provide advice to commissioners and providers alike, assuring acute paediatric and paediatric surgery services for children which are equipped with the right staff in the right place at the right time with the right skills to deliver real improvements in healthcare outcomes for children and young people. We have done so through the collaboration and consensus of clinical leads throughout Kent, Surrey and Sussex coordinated with the help of the Maternity, Children and Young People's Strategic Clinical Network.

Services that should be co-located (based) in same hospital (Purple dependencies)

Where there is an inpatient paediatric service, there must be emergency services for children and young people and anaesthetics on the same site. General paediatric surgery units should have adult general and specialised surgery (including orthopaedics) on the same site. Therefore



indirectly, hospitals with inpatient paediatric services will need to be on-sites that meet the dependency requirements for adult acute surgical take as described in section 5.

Emergency services for children and young people can be delivered on a site without inpatient paediatric services. Examples include A&E departments that receive children, or short stay paediatric assessment units.

A neonatal service must be co-located with an obstetrics service. The neonatal service will normally form part of the acute paediatrics service in hospitals where acute paediatrics and an obstetric service are co-located. It is possible for a neonatal service *not* to be co-located with a paediatric service in the following two settings:

- An Advanced Neonatal Nurse Practitioner model, in which case it must be networked with an inpatient paediatric service or neonatal intensive care.
- A regional neonatal service.

Essential supporting services on-site must include X-ray and diagnostic ultrasound, CT, urgent haematology and biochemistry, and blood bank and transfusion.

There is significant focus on the provision of mental health services to children and young people. On-site adult mental health liaison services are commonplace but those for children and young people are not. The incidence of emergency presentation of children and young people with mental health problems is rising; amongst them deliberate self-harm and attempted suicide. We need our services to be able to respond swiftly to those presenting with mental health disturbance and to support those for whom mental health plays a part in their presentation which may not be immediately obvious. It should be considered essential to have on-site mental health liaison services for children and young people.

Services that should come to patient (patient transfer not appropriate), but could be provided by visiting/inreach from another site (Red dependencies)

These services should ideally be provided on the same site but could be provided elsewhere as long as they can deliver a service to children and young people within 4 hours without them having to be moved.

Gynaecology will usually be provided with an obstetric service on the same site as the paediatric and neonatal service. Where this is not the case, a gynaecology service should be available within 4h to support the paediatric emergency and surgery service.

ENT and urology services should be available to attend a child within four hours.

Palliative care services for children and young people are often provided by community, third sector or voluntary organisations. Arrangements should be in place to support palliative care in the hospital setting where this is necessary or chosen by children, young people and their families on the same day as requested and within four hours.

Laboratory services are increasingly being centralised. It is appropriate for non-urgent laboratory work to take place on a different site. However, access to clinical microbiology and infection support is important and there is no substitute for on-site clinical assessment and multidisciplinary



team working to aid decision making and effective treatment for children and young people with infectious diseases.

Many children benefit from the support of allied healthcare professionals, especially for those with long term conditions. Multidisciplinary team work is vital to effective decision making, treatment planning and treatment delivery. Whilst the physiotherapy, occupational therapy, speech and language therapy and dietetic services may be based off site, there should be regular and prompt on-site availability.

Services ideally on the same site but could alternatively be networked via robust emergency and elective referral and transfer protocols (Amber dependencies)

These services could be provided on the same site but may be provided elsewhere within a networked arrangement that would ensure prompt referral and transfer of the child or young person when necessary. There are many services that fall into this category.

Specialised adult services commonly receive young people making the transition from paediatric to adult services. This may take place between the ages of 13 and 24. There should be effective arrangements for transition that should be described in a pathway (e.g. diabetes and endocrinology, and rheumatology).

Some of these services may be able to provide a local service to children and young people over the age of 16 but who remain under the care of a paediatrician (e.g. urgent endoscopy).

There should be networked arrangements with specialised paediatric services hosted on other sites or providers. This may include the provision of regular on-site outpatient clinics for local access but should also include the ability to refer and transfer children and young people safely and promptly when appropriate (e.g. plastic surgery, burns, neurology, and cardiology).

Hyper-acute and acute stroke services may be able to provide time critical treatment to children and young people presenting with acute stroke.

Critical care services for children commonly will not receive those above 16 years. There needs to be access to adult intensive care units for young people over 16 years who may present to paediatric services or who remain under the care of a paediatrician.

Nuclear medicine and MRI are not considered necessary to be on the same site. There should however be networked arrangements providing prompt access when necessary with appropriate transfer and referral mechanisms in place.

Services that do not need to be on same site, and appropriate arrangements should be in place to obtain specialist opinion or care (Green dependencies)

There are a small number of services which do not require a relationship with acute paediatrics and paediatric surgery. These include adult acute and general medicine (non-specialty), Elderly medicine, hub and spoke vascular surgery services, cardiac surgery, thoracic surgery and cardiac MRI.



7. Discussion and conclusions

We have described the complex inter-dependencies of a wide range of clinical services involved with acute inpatient care, and a range of factors that need to be considered in any reconfiguration of acute clinical services.

For acute hospitals with emergency (A&E) departments, we have demonstrated the key relationships between A&E, acute medical services and surgical services, and critical care. On-site support specialties required by *any one* of these four services defines the clinically recommended minimum range of services required for any 'emergency centre' (as referred to in the Urgent and Emergency Care Review (4)). These findings are mirrored (though on a less detailed scale though) by the previous London Health Programmes work (85) (10). The more specialist additional services whose dependencies we reviewed may have additional service requirements beyond those defined by the four core services, and these are described within the report. These need to be fully considered when planning changes to services, as of course individual hospitals have finite physical capacity (at least in the short term) and there will be physical limits to the range of services they can provide when taking account of their on-site supporting requirements.

Although our report aims to provide a generic review and analysis that could be of relevance across England, the less urban nature of the clinical senate's region (Kent, Surrey and Sussex) and the participants' perspectives, may mean that we have not taken full account of the opportunities and issues particular to large cities. In addition, for any region reviewing effective relationships between services, local factors such as geography, demographics, actual travel times and current infrastructure are essential to overlay.

The evidence base

As others have found however, we identified a paucity of scientific evidence or trial data to guide many of the clinical service co-location recommendations. A range of guidelines is available from medical colleges and societies, as are national service specifications for many of the specialist services, but these are often themselves based on expert consensus and clinical judgement. In addition, assumptions can be based on historical service relationships and personal experience, rather than absolute, objective need. This can lead to inconsistencies when supporting service requirements are viewed through the lens of different specialties. It is also of course quite possible (even likely) that the outcomes of clinical consensus groups will reach different conclusions in the absence of rigorous evidence. However, our approach sought to minimise this risk through wide regional stakeholder engagement and validation, and with a review of the available published evidence.

We acknowledge the more extensive literature review undertaken by the Kings Fund for their report on the reconfiguration of hospital services, and are grateful for the access that was given to their draft report before its publication to minimise the risk that we missed any key references. It is recommended that their report, now published (9), should be read alongside this clinical senate report as a complementary publication.



Networks

This report has identified services that we considered should be based in the same hospitals as each other (the Purple dependencies on the grid), those that could be provided by inreach from another hospital (Red) and those that could be provided by transferring the patient to another centre (Amber). Both Red and Amber dependencies require clinical and organisational networks to agree and deliver appropriate care for such patients. The appropriateness of patient transfer for ongoing care will vary in different geographical regions as this will depend at least in part on the distances involved between hospitals. Monitor found that, whilst the average distance between hospitals with A&Es was 21-26.8 km (relating to hospital turnover), 45 sites were more than 30km from each other, and five more than 60 km ((6). The Darzi Healthcare for London Review emphasised the goal for clinical services of 'localise where possible, centralise where necessary'(85). Network arrangements (with inreach to or outreach from specialist centres) help to deliver this goal, and to mitigate the risk from centralising services of 'distance decay' (the increasing lack of access to such care the further from the centre the patient is). This is likely to be much more of an issue in rural counties and regions than in major conurbations. They enable the best use of scarce specialist expertise, standardise care, and improve access, whilst minimising the need for travel, delays, and hazardous handovers between providers (86)(87).

The Five Year Forward View (7) and the Dalton Review (88) have now described in detail how provider organisations can work together differently in the future, such as in 'urgent and emergency care networks', which can help hospitals support each other, along with community providers, in delivering the full pathway of care for patients by better coordination, pooling of resources, or even integration by a variety of models. It is vital in such planning however, that clinical pathways and the inter-dependencies of individual clinical services within hospitals is fully understood, and this clinical senate report can be used as a resource to aid such sense-checking at a local and regional level.

An important component of this report is the range of general issues and themes that need to be fully considered in any plans to reconfigure hospital-based services. These are fully described within the report, but the key points are summarized below.

Public health perspective

Whilst generic recommendations on service co-locations have been described in this report, the impact on populations could vary significantly from one region to another, and an assessment of that impact should to be undertaken whenever there is a proposed re-location of a service, taking account of local factors such as patient flows, geography and travel times. Such an assessment should also reflect the number of patients treated by the service and any current unmet need, and the risk of reducing access for the defined population, or sub-groups within it. There is also a need to balance the designing of services to cater for every eventuality on a given hospital site, against the 'greater good' or best use of finite resources.

Public and patient considerations

Our patient and public representatives provided a vital 'user' perspective and balance to the clinical discussions, and this is detailed in this report. A number of key points were made. Patients and the public (and staff) need to be involved early in service change discussions and not wait to be



brought in at the formal consultation stage. They should have the clinical case for change, and how it would improve patient outcomes and experience, explained from the start. This would help refine proposals to ensure they are patient-focussed, and increase the likelihood of subsequent community support for sound proposals. Of relevance here in the Future Hospital Commission's report is the core principle that 'patient experience is valued as much as clinical effectiveness' (5), and the NICE quality standards for patient experience (89).

Local network arrangements should be maximised, and patients repatriated to more local facilities as soon as the specialist work is done. Seamless and good communication is key between the various professionals and patients and carers, throughout the patient journey.

The view was expressed that not all individuals, particularly older frail patients, may want a 'gold standard', centralised service if it is provided a long way from their home and family (and that may only deliver minor improvements in outcomes), and they may prefer more local, generalist care. Individual patients and carers should be involved in such discussions and choices.

Paramedics and ambulance transport

Development of paramedic practice, with telemedicine support where required, can deliver enhanced assessment of patients and avoid transfer to hospital, but if hospital assessment is required, may enable bypass of A&E departments and instead direct transfer to ambulatory emergency care facilities, inpatient wards or centralised specialist facilities (such as already happens for major trauma).

The ambulance service is a finite resource, and increasing the scope of clinical networks across hospital sites will have a significant impact on its availability for urgent and emergency calls in the community as well as returning patients from acute hospitals to the community, resulting from longer journeys direct to specialist hospitals, or transfers from local hospitals to specialist hospitals. The capacity of the ambulance service must therefore be considered for any planned relocation of services.

Workforce

There are significant workforce challenges right across health and social care, which will impact on the provision of hospital-based services, and how they are configured. These include the increasing need to deliver 7 day and 24/7 hospital (as well as community) services and rotas, the need for a consultant-delivered service as the norm for inpatient care, and predicted workforce shortages, especially in the community (such as GPs, practice and district nurses).

For example, the Royal College of Physicians' Future Hospitals Commission emphasises the need for an appropriate balance of specialist care and that of hospital generalists (even if specialists taking a generalist role), acting as holistic and coordinating clinicians for patients under their care, aiming to minimise the transfer of patients to different wards (and by implication different hospitals) wherever possible (5).

It is essential that the skills of the future health and care workforce are clearly articulated, and professional barriers are broken down wherever appropriate, to ensure flexibility and adaptability of the workforce is aligned with the needs of patients, an ever increasing number of whom have long



term, chronic conditions and mental health needs. Clarity is required as to where the future workforce needs to be expanded (in the community, in hospitals, or both), to appropriately address the needs of patients, the skills required, and what the range of professions that could provide these using innovative models are. Workforce planning and training then needs to be rapidly aligned with these identified needs.

Teaching, training and research

There are major opportunities and risks from service reconfiguration for teaching, training and research.

For medical schools and other health-related vocational degree courses, the curriculum and experience that can be offered to students must remain comprehensive, accessible and coordinated if across a network of provider organisations. For post-graduate training, the centralisation of specialist services will increasingly require collaboration across training scheme boundaries to ensure exposure and experience is gained. The threat to training from the increasing fragmentation of health care through the use of multiple providers, particularly community based or private providers, must not be under-estimated, and must be considered when contracts are awarded. Post-graduate courses should be offered to aid in recruiting and retaining a high quality clinical workforce for the region.

The delivery of high quality clinical research is in the interests of patients, providers and the health economy and must be nurtured. This requires strong leadership from the region's specialist centres and coordination with all key provider organisations, and organisations such as the regional AHSN, LCRNs, Health Education England offices and other stakeholders.

Overall, it is vital that undergraduate teaching, postgraduate training, and research remain high and explicit on the agendas of all stakeholder organisations (commissioners and providers) involved in planning changes in service delivery, and expert representatives from these three areas should be involved in any service change proposal.

Liaison psychiatry

Liaison psychiatry is a critical service for acute hospitals, in view of the high proportion of inpatients and A&E attenders with mental health needs. Addressing the needs of these patients with an effective on-site service will provide for high quality integrated mental and physical health care, will improve flow and reduce inpatient costs, is recommended by various Royal Colleges, and is a key component of the government's 'Parity of Esteem' drive. Whether the service should be physically based in an acute hospital (Purple on the grid) or accessible on-site with a rapid response time (Red), was debated. This may be a semantic distinction, and trusts would need to decide how to provide the necessary service in the response time required.

Imaging

General X-ray facilities, ultrasound and CT scanning were all considered essential to be based on-site for all the major acute services considered in this report. For most acute services MRI was considered an essential on-site diagnostic tool now. However at present there are significant challenges in delivering 24/7 scanning services where required, relating particularly to manpower



and cost. The reporting of scans, particularly out of hours, can be provided on a networked basis using technologies currently in place and is best provided through a local NHS arrangement to address clinical governance issues. Interventional radiology (IR) is increasingly becoming an alternative to surgical interventions. It is an essential on-site service for trauma, vascular surgery hubs, renal centres and cardiac surgery. For other services, IR could either come to the patient (rated Red), or patients needing urgent IR could be transferred to an IR-equipped hospital (rated Amber). Clinicians, commissioners and providers need to agree clinically appropriate and safe arrangements.

Technology supporting acute care networks

Technology has the potential to leverage specialist skills and support for acutely ill patients across geographically distant hospitals. There is significant scope for trialling the use of telemedicine in acute care, and spreading its use where shown to be of benefit. A prime and well known example is the remote assessment of acute stroke patients for thrombolysis, with other examples in critical care, emergency and trauma surgery, and specialist paediatrics. Effective use of video links for inpatient reviews, and remote clinical data monitoring, would potentially reduce the requirement for the on-site attendance of a supporting specialty, and may reduce the need for transfer to a specialist centre. Such developments could help move some dependencies rated Purple in our grid to Red or even Amber, and those rated Red to Amber. Clinical teams, providers and the urgent and emergency care networks described in the UECR and the Five Year Forward View are strongly encouraged to explore, develop and evaluate such initiatives.

In addition, vital for safe and effective clinical care taking place across teams and providers is the sharing of clinical information to ensure seamless transfers of care, real time access to the results of investigations. Health informatics links between providers and their clinical patient data is essential infrastructure to enable effective networked clinical care.

The clinical case for change

Before embarking on any centralisation of specific acute clinical services, we concluded that a clear clinical case for change must be made (on the presumption that there is one). There is a current lack of clinical evidence in many areas of less specialist acute care for such centralisation, as discussed in the Kings Fund report (9). Reconfigurations also cannot be relied on alone to deliver an improvement in the quality of care, and continual bottom up quality and service improvement work to reduce variation, raise standards and improve safety can have a major cumulative impact, potentially avoiding the need for major organisational change altogether.

To conclude, it is hoped that the currently unique remit of clinical senates in England, to provide clinically led, impartial strategic advice (not mandate) to their commissioners and health systems, has enabled a report of this nature, and that it will provide a helpful overview for both commissioners and providers of the clinical inter-dependencies of acute hospital services, as they consider the shape of their acute hospitals in the years ahead. This report therefore should be seen as a reference point and springboard for detailed local discussions with providers and professions, taking account of all relevant factors.



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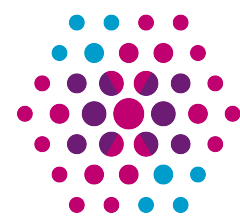
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Appendix A. Clinical reference group and steering group membership

Clinical reference group

| NAME | JOB TITLE | PLACE OF WORK |
|--------------------------|--|---|
| Lawrence Goldberg | SECCS Chair CRG Chair Consultant Nephrologist | Brighton and Sussex University Hospitals NHS Trust |
| Nigel Ashurst | Consultant Psychiatrist and Assistant Medical Director, Kent and Medway NHS Partnership Trust. Clinical Lead for Mental Health, SEC SCN | South East Kent CRHT, St Martins Hospital, Canterbury |
| Priscilla Chandro | Public Governor (Surrey) - South East Coast Ambulance Service Secretary - Cardiovascular Care Partnership UK Co-Opted Council Member - British Association for Cardiovascular Prevention & Rehabilitation Lay Member - South East Coast, Strategic Clinical Network – Cardiovascular Lay Member – South East Coast Clinical Senate | |
| Andy Collen | Clinical Development Manager Advanced Paramedic (Emergency & Urgent Care) Clinical Operations Directorate | South East Coast Ambulance Service NHS Foundation Trust |
| Graham Dodge | Clinical Director for Clinical Support Services, and Consultant Radiologist | Brighton and Sussex University Hospitals NHS Trust |
| Nic Goodger | Clinical Director, SEC Strategic Clinical Network for Cancer Consultant Maxillo-Facial Surgeon | East Kent Hospitals University NHS Foundation Trust |
| Rob Haigh | Chief of Medicine, and Consultant Physician | Western Sussex Hospitals NHS Foundation Trust |



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|---------------------------|--|--|
| David Hargroves | Clinical Lead for Stroke, SEC Cardiovascular Strategic Clinical Network Chair, Training and Education Committee, British Association of Stroke Physicians Consultant Physician and Clinical Lead for Stroke Medicine | East Kent Hospitals University NHS Foundation Trust. |
| Adam Jacques | Clinical Director, SEC Cardiovascular Strategic Clinical Network Consultant Cardiologist and Physician | Ashford and St Peter's Hospitals NHS Foundation Trust |
| Richard Kingston | Renal Clinical Lead, SEC Cardiovascular Strategic Clinical Network Consultant Nephrologist | East Kent Hospitals NHS Trust |
| Matthew Jolly | Joint Clinical Director, SEC Maternity, Children and Young People Strategic Clinical Network. Consultant Obstetrician & Gynaecologist | Western Sussex Hospitals NHS Trust |
| Carolyn Morris | Patient and Public Engagement Representative | |
| Edward Palfrey | Consultant Urologist, and Director of Clinical Integration | Frimley Health NHS Foundation Trust |
| Mansoor Sange | Medical Lead, Kent Critical Care Clinical Group Consultant Anaesthetist and Intensivist | Darent Valley Hospital, Dartford and Gravesham NHS Trust |
| Philippa Spicer | Managing Director | Health Education England (Kent, Surrey and Sussex) |
| Ryan Watkins | Joint Clinical Director, SEC Maternity, Children and Young People Strategic Clinical Network. Consultant Paediatrician and Clinical Director | The Royal Alexandra Children's Hospital, Brighton and Sussex University Hospital Trust |
| *Steven Duckworth | Network Manager – Mental Health Dementia and Neurological Diseases and Cancer | South East Coast Strategic Clinical |
| *Jackie Huddleston | Cardiovascular Strategic Clinical Network Manager Joint Interim Associate Director | South East Coast Strategic Clinical Networks & Clinical Senate |

(*SCN managers, supporting SCN Clinical Directors)



Steering group

| NAME | JOB TITLE | PLACE OF WORK |
|--------------------------|---|---|
| Lawrence Goldberg | SECCS Chair CRG Chair Consultant Nephrologist | Brighton and Sussex University Hospitals NHS Trust |
| Rachael Liebmann | Registrar and Consulting Lead, Royal College of Pathologists Consultant Histopathologist | Queen Victoria Hospital NHS Trust, East Grinstead |
| Ali Parsons | SEC Clinical Senate Manager Joint Interim Associate Director South East Coast Strategic Clinical Networks & Clinical | NHS England |
| Deborah Tomalin | Associate Director South East Coast Strategic Clinical Networks & Clinical Senate, NHS England Interim Director of Commissioning | NHS England |



Appendix B. Definitions of the services listed in the grid rows and columns

Definition of the main clinical services in the grid rows

| ROW TITLES: | DEFINITIONS |
|--|---|
| A&E (Emergency Medicine). Acute unselected take (including acute surgical patients) | This was defined as so called 'Type 1' A&E departments. These are defined (DH) as 'A consultant led 24 hour service with full resuscitation facilities and designated accommodation for the reception of accident and emergency patients'. Whilst the grid dependencies were modelled on A&Es that took unselected patients (i.e. included the receipt of acute surgical patients), the report also reviews the dependencies of type 1 A&Es that did not receive surgical patients (see section 5 of the report). |
| Acute Medical Take | The consultant physician-led hospital service that provides review and management of patients presenting with emergency or urgent medical conditions, and their inpatient care. |
| Adult Acute Surgical Take | Unit offering consultant surgeon -led adult surgery acute diagnostic, treatment and triage services for suspected acute surgical conditions. |
| Major Trauma Centre | Specialist hospital providing 24 hours per day consultant-led multidisciplinary care for seriously injured patients. The specialist teams have immediate access to state-of-the-art diagnostic and treatment facilities. It is at the centre of a trauma network supporting trauma units within the network. These services serve a population of 2-3 million. It needs to provide audited outcomes |
| Trauma Unit | A hospital that is responsible for the management of trauma patients who are not classified as having major trauma. These units may receive major trauma patients due to under triage or because they require immediate life saving interventions before continued care at a major trauma centre. These act as part of the network. It needs to provide audited outcomes. |
| Vascular Surgery (Hub) | Unit with a dedicated multi-disciplinary vascular team, including interventional radiology, available 24 hours a day for diagnostic and treatment interventions for vascular patients and to support other services to control vascular bleeding and manage vascular complications. It provides a centre to support vascular spoke units without such services and to work jointly with diabetic and podiatrist services to minimise tissue loss and amputation. This will typically serve a population of 800,000 or above. It needs to provide audited outcomes |



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| Vascular Surgery (spoke) | Several models exist but are based upon the specifications set out by the vascular hub. Whilst the majority of arterial surgery will not be performed at the spoke hospital, some day case surgery and interventional diagnostic procedures may be depending on the hub spoke model. |
| Adult Critical Care (Intensive Care) | Adult Critical Care: An Intensive Care Unit (ICU) is a specially staffed and equipped, separate and self-contained area of a hospital dedicated to the management and monitoring of patients with life threatening conditions. It provides special expertise and the facilities for the support of vital functions. It encompasses all areas that provide Level 2 (high dependency) and/or Level 3 (intensive care) care as defined by the Intensive Care Society document Levels of Critical Care for Adult Patients (2009). |
| Cardiology: non-interventional | Management of general cardiology in-patients by cardiologists. No percutaneous coronary intervention on site. May offer diagnostic coronary angiography, pacemaker, and device implantation (which includes implantation of implantable defibrillators (ICD) and cardiac resynchronisation therapy (CRTP and CRTD)). |
| Cardiac Surgery | Adult cardiac surgery only. |
| Cardiology: Interventional - primary PCI for STEMI | Acute heart attack units commissioned for patients with ST elevation myocardial infarction operating 24/7. These units will also offer coronary intervention for all acute coronary syndrome patients and elective coronary intervention. May offer cardiac device service (which includes implantation of implantable defibrillators (ICD) and cardiac resynchronisation therapy (CRTP and CRTD)). |
| Cardiology: Interventional - PCI (non-STEMI) and devices | Units offering percutaneous coronary intervention for Acute Coronary Syndromes and elective work. These centres are not commissioned to accept patients with ST elevation myocardial infarction via ambulance but often provide primary percutaneous coronary intervention to self presenters. May offer cardiac device service (which includes implantation of implantable defibrillators (ICD) and cardiac resynchronisation therapy (CRTP and CRTD)). |
| Cardiology: Interventional - structural heart disease (including TAVI, mitraClips) | Units offering percutaneous coronary intervention for Acute Coronary Syndromes and elective work. These centres are not commissioned to accept patients with ST elevation myocardial infarction via ambulance but often provide primary percutaneous coronary intervention to self presenters. May offer cardiac device service (which includes implantation of implantable defibrillators (ICD) and cardiac resynchronisation therapy (CRTP and CRTD)). |
| Hyper Acute Stroke Unit | 24/7 non-selective bed availability with immediate access to neuroimaging, IV thrombolysis, high dependency level staffing ratios and support services (75) |
| Acute Stroke Unit | On-going care of patients who suffer a stroke following hyper-acute assessment and treatment. |
| Renal Services inpatient Hub | A renal unit providing all aspects of in-patient renal care with support of a specialist renal Multidisciplinary team. This does not include acute transplantation |



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| Consultant led Obstetric Services | A service providing antenatal, intra-partum and postnatal obstetric care as opposed to midwife only care which might be provided at home or in a midwife led unit. The co-dependencies are for units capable of managing all but the most complex cases which should be referred to specialised centres with the appropriate additional co-capabilities. |
| Acute (non-specialised) paediatrics and paediatric surgery | Acute paediatrics and paediatric surgery includes the functions of an inpatient service and excludes a stand alone short stay paediatric assessment unit and community paediatrics. It also assumes service providing excluding specialised services currently commissioned by NHS England. |

Definition of the supporting clinical services in the grid columns

| COLUMN TITLES: | DEFINITIONS |
|--|---|
| A&E (Emergency Medicine) | A&E department |
| Acute and general medicine | Acute medical take |
| Elderly Medicine | Consultant-led inpatient service |
| Respiratory Medicine (including bronchoscopy) | Consultant-led inpatient service, with inpatient bronchoscopy service |
| Medical Gastroenterology | Consultant-led inpatient service |
| Urgent GI endoscopy (Upper & Lower) | Inpatient service |
| Diabetes and endocrinology | Consultant-led inpatient service |
| Rheumatology | Consultant-led inpatient service |
| Ophthalmology | Consultant-led inpatient service |
| Dermatology | Consultant-led inpatient service |
| Gynaecology | Consultant-led inpatient service |
| General (Adult) Surgery (upper GI and lower GI) | Consultant-led inpatient service |
| Trauma | Consultant-led inpatient service (including surgery) |
| Orthopaedics | Consultant-led inpatient service (including surgery) |
| Urology | Consultant-led inpatient service (including surgery) |



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|---|--|
| ENT | Consultant-led inpatient service (including surgery) |
| Maxillo-facial surgery | Consultant-led inpatient service (including surgery) |
| Hub vascular surgery | Full centralised service |
| Spoke vascular surgery | Designated service (nature may vary from trust to trust within networks) |
| Neurosurgery | Consultant-led inpatient service (including surgery) |
| Plastic surgery | Consultant-led inpatient service (including surgery) |
| Burns | Consultant-led inpatient service (including surgery) |
| Critical care (adult): ITU/HDU | ITU/HDU beds and consultant-led care |
| Critical care (paediatric) | ITU/HDU beds and consultant-led care |
| General Anaesthetics | Consultant-led inpatient service |
| Acute Cardiology | Consultant-led inpatient service (general inpatient cardiology - not intervention) |
| Thoracic surgery | Consultant-led inpatient service (including surgery) |
| Cardiac surgery | Consultant-led inpatient service (including surgery) |
| Hyper-acute stroke unit | Includes thrombolysis, neuroimaging, beds and support services (not just ability to give thrombolysis) |
| Acute stroke unit | Ongoing care of stroke inpatients after hyper-acute care |
| Nephrology (not including dialysis) | Consultant-led inpatient service |
| Inpatient dialysis | Provision of renal unit / renal ward haemodialysis (does NOT include haemofiltration on ICUs) |
| Acute oncology | Consultant-led inpatient service |
| Palliative care | Consultant-led inpatient service |
| Neurology | Consultant-led inpatient service |
| Acute Paediatrics (non-specialised paediatrics and paediatric surgery) | Full general service and beds |
| Neonatology | Full general service and beds |
| Xray and diagnostic ultrasound | Diagnostic equipment on-site |
| CT Scan | Diagnostic equipment and acquisition done on-site |
| MRI Scan | Diagnostic equipment and acquisition done on-site |



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|---|--|
| Cardiac MRI | Diagnostic equipment and acquisition done on-site |
| Nuclear Medicine | Diagnostic equipment and acquisition done on-site |
| Interventional radiology (including neuro-IR) | Diagnostic equipment and intervention done on-site. Includes non-vascular interventions |
| Clinical microbiology/ infection service | Consultant-led provision of clinical advice on infections, antibiotics and infection control |
| Laboratory microbiology | Laboratory-based diagnostics |
| Urgent diagnostic Haematology and Biochemistry | Laboratory-based haematology and biochemistry diagnostics for the most commonly required urgent tests (including near patient testing) |
| Acute inpatient Rehabilitation | Designated inpatient beds and consultant-led rehabilitation service |
| Occupational Therapy | Fully trained service provision |
| Physiotherapy | Fully trained service provision |
| Speech and language | Fully trained service provision |
| Dietetics | Fully trained service provision |
| Acute mental health services | Consultant-led inpatient service |



Appendix C. Clinical senates and the South East Coast Clinical Senate

Clinical Senates were set up in April 2013 as a result of the Future Forum consultation (90) prior to the Health and Social Care Act of 2012 which recommended that “multi-speciality Clinical Senates should be established to provide strategic advice to local commissioning consortia, health and wellbeing boards and the NHS Commissioning Board”

Clinical Senates are a non-statutory organisational model for the provision of independent strategic clinical advice and clinical leadership. Within this model, commissioners, the CCGs and NHS England, remain accountable for the commissioning of services and the providers are accountable for the quality of service delivery. Clinical Senates are comprised of a core Clinical Senate Council and a wider Clinical Senate Assembly. Each Senate has a clinical chair.

The Clinical Senate Assembly is a diverse multi-professional forum providing the Council with ready access to experts from a broad range of health and care professions. Membership of the assembly will encompass the ‘birth to death’ spectrum of NHS care and will include patient representatives.

The South East Coast Clinical Senate (SECCS) is responsible for delivering independent strategic clinical advice and leadership across the South East Coast (SEC) area to assist CCGs, local authorities, Health and Wellbeing Boards and NHS England to make the best decisions about health care for the populations they represent. SECCS aims to provide advice that is safe, evidence based and impartial, informed through engagement with a broad range of health and wider care professionals and patients and public in its formulation.

Our SECCS mission statement is:

“A respected body of senior multidisciplinary health and care professionals, working with patients and the public, to provide strategic independent advice on South East Coast health care issues, to support commissioners make their decisions that will transform the quality, experience and better integration of patient care and ensure that services are sustainable, effective and efficient”.

More details regarding the SEC Clinical Senate and its work can be found at:
www.secsenate.nhs.uk



South East Coast Clinical Senate Council Members

| NAME | JOB TITLE | PLACE OF WORK |
|---|---|---|
| Lawrence Goldberg | Clinical Senate Chair Consultant Nephrologist | Brighton and Sussex University Hospitals NHS Trust |
| Amanda Allen | Therapy Manager | Maidstone and Tunbridge Wells NHS Trust |
| Christopher Allen (Deputy to Amit Rai) | Consultant in Dental Public Health | Public Health England Kent Surrey Sussex Centre |
| Sally Allum | Director of Nursing & Quality | NHS England Kent & Medway Area Team |
| Katie Armstrong | Clinical Chief Officer General Practitioner | NHS Coastal West Sussex Clinical Commissioning Group |
| Mandy Assin | Consultant Psychiatrist | Sussex Partnership NHS Foundation Trust |
| Graham Bickler | Centre Director | Public Health England - Kent, Surrey and Sussex |
| Michael Bosch | General Practitioner | Smallfield Surgery, Horley, Surrey |
| Maxine Bullen | Independent Patient and Public Engagement Facilitator | |
| Priscilla Chandro | Public Governor (Surrey) - South East Coast Ambulance Service Secretary - Cardiovascular Care Partnership UK Co-Opted Council Member - British Association for Cardiovascular Prevention & Rehabilitation Lay Member - South East Coast SCN – CVD | |
| David Davis | Paramedic, Clinical Informatics Advisor, Medical Directorate, | NHS England, NHS Pathways Clinical Lead, SECAMB |
| Julia Dutchman- Bailey | Director of Nursing & Quality | Surrey & Sussex Area Team, NHS England |
| Andrew Foulkes | Medical Director General Practitioner, Bogner, West Sussex | Surrey and Sussex Area Team, NHS England |
| Peter Green | Chief Clinical Officer, General Practitioner | NHS Medway Clinical Commissioning Group |
| Rachel Harrington (Deputy to Andrew Foulkes) | Assistant Director Clinical Strategy, Medical Directorate, | Surrey and Sussex Area Team, NHS England |



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|---|--|---|
| Des Holden | Medical Director | Surrey and Sussex Healthcare NHS Trust |
| Linda Honey | Head of Prescribing and Medicines Commissioning | NHS North West Surrey Clinical Commissioning Group |
| Caroline Jessel (Deputy to James Thallon) | Clinical Strategy Lead, Kent and Medway Area Team Sustainability Lead, | South of England, NHS England |
| Tony Kelly | Consultant Obstetrician & Gynaecologist, Honorary Clinical Senior Lecturer & Associate Medical Director for Quality & Innovation | Brighton & Sussex University Hospitals, The Royal Sussex County Hospital |
| Rachael Liebmann | Registrar and Consulting Lead | Royal College of Pathologists |
| Joe McGilligan | Chief Clinical Officer General Practitioner | NHS East Surrey Clinical Commissioning Group Local Government Association Health and Wellbeing Champion |
| Carolyn Morris | Patient and Public Engagement Representative | |
| Edward Palfrey | Consultant Urologist / Clinical Integration Director | Frimley Health NHS Foundation Trust |
| Amanda Parker | Director of Nursing & Quality | Queen Victoria Hospital NHS Foundation Trust |
| Jo Pritchard | Managing Director | CSH Surrey |
| Amit Rai | Chair, Dental Local Professional Network, Medical Directorate, | Surrey and Sussex Area Team, NHS England |
| Mohit Sharma | Centre Consultant | Public Health England - Kent, Surrey and Sussex |
| Philippa Spicer | Managing Director | Health Education England, Kent, Surrey & Sussex |
| James Thallon | Medical Director Kent and Medway Area Team, General Practitioner | NHS England |



Appendix D. Contributors and acknowledgements

Literature Review

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Summit Attendees

Many thanks to all delegates who attended the summit on 10.09.14. A list of attendees can be found on the clinical senate website at <http://www.secsenate.nhs.uk>

Additional Contributions

The following individuals were consulted by members of the clinical reference group, and their specialist knowledge and input has been invaluable, for which we are very grateful.

Professor Kevin Davies, Chair of Medicine, Brighton and Sussex Medical School. Author of the section on teaching, training and research.

Professor Andy Newton. Consultant Paramedic, Director of Clinical Operations, SECAmb; Chair, College of Paramedics

Jane Pateman, Medical Director, SECAmb

David Davis, Clinical Informatics Advisor, Medical Directorate, NHS England

Lucas Hawkes-Frost, NHS Pathways Clinical Lead, Clinical Operations Directorate, SECAmb

Libby Hough, Customer Account Manager (Surrey), Commercial Services, SECAmb

Jon Amos, Customer Account Manager (Kent), Commercial Services, SECAmb

Ben Banfield, Customer Account Manager (Sussex), Commercial Services, SECAmb

Matt England, Clinical Quality Manager, Medical Directorate, SECAmb

Inam Haq, Director of Undergraduate and Postgraduate Studies, Brighton and Sussex Medical School

Des Holden, Medical Director of the Academic Health Science Network for Kent, Surrey, Sussex

Professor Gordon Ferns, Director of the Local Clinical Research Network for Kent, Surrey Sussex



Kelvin Wright, Consultant Emergency Department & Intensive Care Unit Frimley Park Hospital, Trauma Network Clinical Director - South West London & Surrey Major Trauma CRG Representative - South East Coast

Hugh McIntyre, Consultant Care of the Elderly, East Sussex Healthcare NHS Trust

Claudia Degiovanni, Consultant Dermatologist Brighton and Sussex University Hospitals NHS Trust

Paul Wallman, Principal Lead Clinician and Consultant in Emergency Medicine, Director of Quality and Safety for Major Trauma, Brighton and Sussex University Hospitals NHS Trust & Sussex Major Trauma ODN

Mike Carraretto, Consultant Intensivist, Medical Lead for the SEC critical care network and CRG member - was present at the SECCS summit.

Rhian Edwards, Consultant Intensivist, Medical Lead for the Sussex Critical Care Group.

Debbie Higgs, Consultant Nurse Critical Care, Kent Critical Care Clinical Group.





Email: england.clinicalsenatesec@nhs.net

Web: www.secsenate.nhs.uk