PRE OPTIONS APPRAISAL

ABSTRACT
A review of how clinical evidence and national guidance may inform the selection of acute hospital reconfiguration options in Mid and South Essex Success Regime (MSESR)

Eastern Academic Health Science Network
February 2017
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The scope of the report

The primary objective of the work commissioned was to understand what published evidence is available on clinical outcomes to help the system select a preferred model of acute reconfiguration in the Mid and South Essex Success Regime (MSESR). The report will be shared with representatives from MSESR who are attending an options appraisal workshop on 22 February 2017. As it is based on a number of assumptions, the report should be accepted as information to consider during the decision-making process. It does not constitute a recommendation or a preference for any individual option.

The work was built on several key parameters determined before Eastern Academic Health Science Network (Eastern AHSN) was commissioned:

- The report reviewed the five options for acute hospital reconfiguration identified in the Sustainability and Transformation Plan (STP) documents. Considering alternative options was outside the scope of the work.
- The work focussed on published evidence in the first instance though was extended to include published guidance from NHS England and the Royal Colleges. We are aware that other observational studies may be available but if these did not meet our criteria for inclusion we have not considered them as part of the review.
- We are aware that other key criteria will be used to select the preferred model(s) such as patient experience, workforce sustainability and travel times. This report did not consider these areas specifically but they are mentioned if there is evidence of a link to clinical outcomes.
- We considered reviewing existing variation as part of the work, however we have found an inconsistent approach to publishing the results of national clinical audits. Some are made available to the public and others are only shared with participating trusts. This made it difficult to get a consistent understanding of clinical variation. We recommend that local participants consider existing unwarranted variation as part of their decision making based on locally available data.

High level approach

The review has been focussed on understanding how the evidence collated relates to the options proposed and to answer this question, we approached the work in several phases. These phases are described in figure one.

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1 Eastern Academic Health Science Network, one of 15 AHSNs established nationally whose goal is to improve patient and population health outcomes by translating research into practice.
Subsequently, we were asked to review the evidence for elective surgery to ensure completeness of the work for all work streams. For each stage, the approach taken is described in more detail in appendix one. A full list of appendices can be found at the end of this report.

Our output is based upon the models as they were described to Eastern AHSN in October 2016 and January 2017 and in the relevant sections we summarise the key attributes of the models. Further adaptations to the models, as described, may change the relevance of evidence collated.

Summary of key findings

Overall there was limited research available regarding the exact model being proposed by MSES, though there is evidence on component parts of models. The evidence showed broad support for the components proposed by MSES. Given the evidence is relevant to component parts of the models and a reliance upon judgement in many areas, it must be acknowledged that the outputs will be open to debate. However, this independent report is intended to provide a baseline for discussion at the options appraisal workshop and should form part of a set of materials to help inform the debate.

N.B. Eastern AHSN have not reviewed detailed activity or travel time information to determine the relative weighting of each component part. Assumptions made have been documented and may well be revised by local decision makers who benefit from additional local context and information.

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2 The summary diagram of the five options provided by MSES in January 2017 can be found in appendix two
Indicative relative positions

All five options scored above neutral (5.0) indicating broad support for the options proposed by MSESIR, however the differential in scoring between the options is limited and therefore local judgement is required.

Looking at the positions for each option and with equal importance placed upon all four work streams, they placed as:

<table>
<thead>
<tr>
<th>Option</th>
<th>Score</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A</td>
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</tr>
<tr>
<td>1B</td>
<td>6.33</td>
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<tr>
<td>1C</td>
<td>6.60</td>
<td>4 out of 5</td>
</tr>
<tr>
<td>2A</td>
<td>7.43</td>
<td>1 out of 5</td>
</tr>
<tr>
<td>2B</td>
<td>7.10</td>
<td>2 out of 5</td>
</tr>
</tbody>
</table>

Table 1 Summary indicative positions

Table 2 Key

<table>
<thead>
<tr>
<th>Options</th>
<th>Stage 1</th>
<th>Stage 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refers to the published evidence collected and reviewed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>This is weighted as more important than general guidance / best practice though in practice it has little impact on overall results.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Refers to the review of published guidance from NHS England and the Royal Colleges</td>
<td></td>
<td></td>
</tr>
<tr>
<td>This is weighted as less important than published research.</td>
<td></td>
<td></td>
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</table>

Options | Stage 1 Weighted at 0.6 | Stage 2 Weighted at 0.4 |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Paediatrics</td>
<td>Maternity</td>
<td>Emergency</td>
</tr>
<tr>
<td>1A</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>1C</td>
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<td>7.43</td>
<td>7</td>
</tr>
<tr>
<td>2B</td>
<td>7.10</td>
<td>6</td>
</tr>
</tbody>
</table>

Figure 2 Overall positions by option by work stream
N.B. The positions will be subject to change if MSESIR decides to weight clinical areas differently. For example, they may decide that emergency care is a more important factor than maternity.

**Further information**
An explanation of how the findings were generated has been provided and is broken down into each clinical work stream. Additionally, the appendices contain further information on the outputs generated as a result of the research carried out in stage one and stage two.

We recommend readers spend time familiarising themselves with the assumptions made and the evidence reports before the options appraisal workshop. The detailed evidence reports explain the quality and quantity of the evidence found for each component part which varies across the four work streams.
Paediatrics

What the clinical evidence told us
Two reviewers independently searched ten bibliographic databases for published research from the UK or other developed countries. About 1,000 studies were screened and 21 were found to be relevant, six of which were from the UK (29%). Studies varied considerably in quality and no research was identified about the clinical outcomes of the exact model proposed by MSESR. That said, research indicated:

- Clinicians that specialise in children or have higher volumes of activity are associated with improved mortality and length of stay. This may support proposals to centralise paediatric inpatient services and surgery on fewer sites, though there is mixed evidence about this; and,
- There was no good evidence to either support or challenge proposals for a single regional high dependency unit for children.

The full evidence review can be found in appendix three.

How did the five models differ?
All five models of reconfiguration take a phased approach to delivery and include:

- A specialist children’s centre, housed at the Mid Essex Hospital NHS Trust - Broomfield site in Chelmsford acting as a centre for excellence;
- Centralised surgery on children, inpatients and potential for a single paediatric high dependency unit (HDU) offered at the children’s centre; and,
- All sites will have a paediatric assessment unit (PAU) with inpatient services only available at the children’s centre.

The variance between the five options is the co-location of the specialist children’s centre with other specialist provision i.e. is it better to be located with specialist obstetric unit (option 1B and 2B) and/or a specialist emergency hospital (option 1B and 2B).

Reviewing the five options
Stage one evidence review
Research did not identify any specific evidence relating to the exact configurations proposed by MSESR but evidence was available about specific components. While some good quality studies were available, most research was observational and often based on single sites. Studies of individual components were often relatively low in quantity though aspects such as the centralising of paediatric surgery were of a high quality according to

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3 A list of references to support these positions are provided in the full evidence review
traditional hierarchies of evidence. The evidence broadly supported the options being proposed and therefore no option should be rated as less than a six i.e. a positive rating. Given the quality of the evidence available, all options were equally scored as an eight.

**Stage two guidance review**

In all five options it is proposed that the children’s centre will be co-located with the plastic and burns unit, which moves towards national recommendations. Other national standards and guidance for the provision of children’s services, have been published by various Royal Colleges including ‘Facing the future’, ‘Standards for Children’s Surgery’ and ‘High Dependency Care for Children - Time To Move On’ which set out clear standards for both elective and acute inpatient care. ‘Facing the future’ has called for the development of fewer but larger inpatient paediatric departments, to improve workforce resource, skill and experience available 24/7 to improve outcomes for children.

In its current configuration MSESR has below optimal levels of trainee doctors and specialist nurses, though the consultant workforce is in line with national expectations. The consolidation of services into a single children’s centre would therefore likely support a more sustainable workforce and enable the children’s centre to meet the required standards for a high dependency unit.

Given the placement of the children’s centre is consistent across all five options, any scoring based on alignment with national guidance and standards for paediatrics is consistent across all options.

The differentiator for the options proposed is if co-location with other speciality services would provide additional benefit. Reviewing clinical interdependencies, the services which must be provided for children’s services are adult general surgery (including Orthopaedics), diagnostics, urgent haematology and biochemistry, blood bank and transfusion, therefore there may be a benefit from being co-located with the specialist emergency centre. The Acute Leadership Group debated this point and concluded that this would not bring additional clinical benefits. In light of their advice we have rated all options as seven.

The stage 2 guidance review can be found in appendix four.

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4 National Network for Burn Care, National Burn Care Standards, January 2013
5 Facing the future: Standards for acute general paediatric services, 2015 Royal College of Paediatricians and Child Health
6 Standards for Children and Young people in Emergency care settings, 2012
7 High Dependency Care for Children - Time To Move On, October 2014
8 Workforce numbers were provided by MSESR
9 Acute Leadership Group is a network of senior local clinicians providing advice and input into the programme
Paediatric scoring
The table below summarises the scores for each stage of the review, against all five proposed options.

<table>
<thead>
<tr>
<th>Options</th>
<th>1A</th>
<th>1B</th>
<th>1C</th>
<th>2A</th>
<th>2B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 1</td>
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<td>8</td>
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<td>8</td>
<td>8</td>
</tr>
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</tr>
<tr>
<td>Weighted at 0.4</td>
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</tbody>
</table>

Figure 3 Overall Paediatric scores

Assumptions that would impact upon scoring
- That the co-location of the specialist children’s centre with the specialist emergency centre does not bring additional clinical benefits as advised by the Acute Leadership Group.
Maternity

What the clinical evidence told us
Two reviewers independently searched ten bibliographic databases for published research from the UK or other developed countries. More than 2,000 studies were screened and 72 were found to be relevant, 14 of which were from the UK (19%). Most were of medium to low quality, though there were high quality studies about specific components.

The main findings were:

- There is limited research about clinical outcomes for the exact model(s) proposed for MSESR; though
- There is evidence to support larger and more specialist obstetric units for higher risk deliveries and co-located midwife-led units for lower risk births, but the best number and type of units per region is unclear from the research.

The full evidence review\(^\text{10}\) can be found in appendix five.

How did the five models differ?
Across all five reconfiguration models, the specific components of maternity services remain the same. It is proposed that there will be:

- A single specialist obstetric centre for high risk births;
- All hospitals will have an obstetrician-led unit with a co-located midwife-led unit; and
- Level two neonatal care at all sites.

The points of differentiation between the five reconfiguration options is the location in which the services will be provided and the co-location of the specialist obstetric centre with other specialist provision: children’s centre (options 1B and 2B) or the Essex cardiovascular centre (options 1A and 2A). All five configuration options house the specialist obstetric centre at the same hospital site as the specialist emergency hospital.

\(^{10}\) A list of references to support these positions are provided in the full evidence review
Reviewing the five options

Stage one evidence review

The evidence indicated that specialist and high volume centres have better maternal and infant mortality and morbidity for high-risk births. There is no evidence that larger units are better for low-risk births. Reports also suggested co-located midwife-led units have less intervention and better maternal outcomes for low-risk births. This broadly supports the options being proposed and therefore no option should be rated as less than a six.

The evidence identified that there could be a trade-off between the improvements in mortality that centralisation could provide and increased travel times, particularly for high risk women. We have therefore explored each option from these two perspectives to identify comparative benefits.

Travel times

Using information provided by MSESRI, the increase in travel times for maternity services for each option has already been calculated. The results of this were used as a proxy for travel time impact under each option and two options seemed adversely impacted i.e. these two options increased travel times for women more significantly. Based on the proposed configurations, it is primarily high risk women who would be impacted but it is noted that the majority of high risk women are likely to be admitted prior to labour and therefore the impact of additional travel times during an emergency are likely to be limited. As a result, the two options that have the biggest impact on travel times (1B and 2B) have had their scores reduced by 0.5.

Increased volumes

We know the evidence recommends that centralising high risk births, leading to increased consultant presence (24/7) is likely to improve mortality. Whilst the exact configuration of maternity services in a ‘yellow’ hospital (applicable to options 2A and 2B) is not yet finalised, should these sites move to lower volume obstetrician and midwife-led units with reduced neonatal capacity, then there would be increased general activity, on top of the shift of high-risk births, on the other two sites. Therefore, options 1A, 1B and 1C scored one and options 2A and 2B scored two points for the potential impact these options have on centralisation of services.

Stage two guidance review

There are multiple sources of guidance from the Royal College of Obstetrics and Gynaecologists. However, it is the ‘Reconfiguration of Women’s Services in the UK’ which comprehensively sets out decision criteria for the configuration of maternity services. The primary consideration in reconfiguring these services is the clinical workforce, skill-mix and numbers, aligned to the volume and complexity of births. Additionally, interdependencies with other services must be considered for obstetrician-led units.

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11 Submission for the Clinical Senate Panel, September 2016, Pg 236-240
12 Reconfiguration of women’s services in the UK, 2013 Good practice paper No. 15 Royal College of Obstetricians and Gynaecologists
For women, choice of birth location is an important factor and this is reinforced in the Better Births report\textsuperscript{13}. The assessment after reading relevant national guidance is that the options being proposed are aligned to national guidance, so no option should be rated below a six.

To differentiate between the options proposed, key factors were identified that underpin the guidance and clinical standards. These factors were:

- Is the clinical workforce sufficient?
- Are there appropriate links to other interdependent services?
- Do the options offer choice?
- Is it aligned to Clinical Senate recommendations?

**Clinical workforce**

Current workforce levels are sufficient to run the existing MSES model of 3 obstetrician led and 3 midwife led units, though consultant levels are slightly below recommended guidelines\textsuperscript{14}. The introduction of a specialist centre for high risk births requires additional workforce, over and above current capacity in the system however, as this service is proposed in all five options, no differential scoring has been applied.

**Interdependent services**

Guidance\textsuperscript{15} is clear that consultant led obstetric services must have access to a number of other services, as a minimum to include: General anaesthetics, adult critical care, neonatology, urgent diagnostics including interventional radiology, haematology and biochemistry, transfusion and blood bank. Therefore, the specialist obstetric unit must be co-located with the specialist emergency centre as the primary provider of some of these services.

Obstetrician-led units will also be delivered within the ‘amber’ and ‘yellow’ models and will have access to an elective Intensive Care Unit (ICU) and full diagnostics.

On this basis, no differential scoring has been applied.

\textsuperscript{13} Better Births, Improving outcomes of maternity services in England. A Five Year Forward View for Maternity Care, 2016

\textsuperscript{14} Submission for clinical senate panel, September 2016, Pg 147

\textsuperscript{15} Reconfiguration of women’s services in the UK, 2013 Good practice paper No. 15 Royal College of Obstetricians and Gynaecologists
**Offering choice**
With all three sites continuing to offer obstetrician-led units and collocated midwife-led units, most women will continue to have a choice of sites. High risk women will attend the new specialist centre however it is not clear whether this centre will also accept low risk births. The impact of travel times, as presented to the Clinical Senate in October, were considered, however without clarity on acceptance criteria on each site, no differential scoring could be applied to this area.

**Clinical Senate recommendations**
The Clinical Senate report asked for further consideration and analysis of the impact on travel times, as well as whether a standalone midwife-led unit (MLU) on the “yellow”16 site would be viable. As a result of this feedback, MSES has determined that there will not be a new freestanding MLU.

**Maternity scoring**
The table below summarises the scores for each stage of the review, against all five proposed options.

<table>
<thead>
<tr>
<th>Options</th>
<th>1A</th>
<th>1B</th>
<th>1C</th>
<th>2A</th>
<th>2B</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stage 1</strong>&lt;br&gt;Weighted at 0.6</td>
<td>7</td>
<td>5.5</td>
<td>7</td>
<td>8</td>
<td>7.5</td>
</tr>
<tr>
<td><strong>Stage 2</strong>&lt;br&gt;Weighted at 0.4</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
</tbody>
</table>

*Figure 4 Overall maternity scoring*

16 Please refer to appendix two which shows the reconfiguration options proposed and the colour coding that applies to each
Assumptions that would impact upon scoring

- The latest clinical workforce data should be assessed to understand if assumptions made remain valid.

- The quantity and quality of evidence regarding travel times is low, should this be considered insufficient to base differential scoring on then adjustments would need to be made to stage 1 scores.

- If detailed information regarding the location of women deemed high risk is available, this should be used to inform the comparative rating of options in the stage two guidance review.

- If the high risk centre does not accept low risk births then the choice and travel impact should be considered and used to inform the rating of options in the stage two guidance review.
Emergency care

What the clinical evidence told us

Two reviewers independently searched ten bibliographic databases for published research from the UK or other developed countries. More than 15,000 studies were screened and 79 were found to be relevant, 30 of which were from the UK (38%). Most studies were of low to medium quality based on traditional hierarchies of evidence, though certain components have a high quality evidence base supporting them e.g. centralising emergency surgery.

The main findings were:

- There was limited published research about the exact model proposed for MSESR.
- If changes to A&E services and emergency surgery result in longer travel times this should be considered carefully. There is evidence that increased travel times can increase mortality in emergencies.
- If changes to emergency surgery and acute inpatient care result in higher volumes for surgeons and specialists, this may reduce mortality, morbidity and complications.
- There is some UK evidence to suggest that centralising hyperacute stroke units can improve mortality and morbidity.

The full evidence review\(^\text{17}\) can be found in appendix seven.

How did the five models differ?

Across all five options for reconfiguration it is proposed that there will be:

- A centralised specialist emergency hospital receiving the most life-threatening conditions including a specialist hyperacute stroke unit (HASU) and trauma unit;
- Emergency surgery largely centralised to the specialist emergency hospital including all overnight surgery;
- All hospital sites to provide a 24/7 emergency centre with varying intakes and services provided.

Points of differentiation are seen within the proposed reconfiguration options. Options 1A, 1B and 1C would mean that two hospital sites would follow the ‘amber’ hospital model and therefore provide:

- A local emergency centre including a paediatric assessment unit (PAU) and a frailty assessment unit (FAU)

\(^{17}\) A list of references to support these positions are provided in the full evidence review
• Acceptance of daytime ambulances (08.00 – 22.00 To be confirmed by MSESR)
• Some emergency surgery in the daytime and associated inpatient care

Proposed reconfiguration options 2A and 2B would mean that Southend University Hospital NHS Foundation Trust (SUHFT) would follow the ‘yellow’ hospital model and therefore provide:
• A local emergency centre including PAU and FAU

The second potential source of differentiation between models would be the co-location of the specialist emergency hospital with the Essex cardiovascular centre (options 1A and 2A).

Reviewing the five options
Stage one evidence review
The review did not identify any published research that examined clinical outcomes for the exact configuration of emergency services being considered in MSESR. Non-empirical articles described service transformations in other parts of the UK or internationally but these descriptive articles and opinion pieces were outside the scope of the review. When considering all elements of the evidence review, the fundamental question is whether the likely improvements in mortality, morbidity and length of stay driven by centralising emergency surgery, where the evidence tended to be of a higher quality, offsets any potential deterioration in mortality driven by increased travel times, where the evidence tended to be of a medium quality.

Centralising emergency surgery
Centralising emergency surgery would mean that some hospitals and surgeons may see greater numbers of patients. Systematic reviews and other studies have found that surgeons that see a high volume of patients and surgeons specialised in a specific field have better outcomes. There is mixed evidence about whether hospitals that see a higher volume of patients for emergency surgery have better outcomes. A systematic review of 27 studies found that centralised units and hospitals with dedicated emergency operating rooms, access to radiology and intensive care facilities improved mortality and morbidity compared with traditional care. The reviewers noted that key success factors were having senior clinicians present onsite during office hours and dedicated to emergency care while on call, surgical assessments taking place on surgical admissions units rather than in Emergency Departments and 24-hour access to dedicated emergency operating rooms. There is mixed evidence about whether hospitals that see a higher volume of patients or are more ‘specialised’ have reduced length of stay. However, some research suggests that reconfiguring services so some hospitals have a higher rate of emergency surgery can reduce length of stay.
Reviewing the options, options 1A, 1B and 1C reflect less centralised options as opposed to options 2A and 2B. Therefore, we have rated options 2A and 2B higher as they are more likely to deliver the improvements in mortality and morbidity.

*Hyperacute stroke units (HASU)*

Consolidating hyperacute stroke services at a smaller number of hospitals has been associated with improved 90-day survival rates in London and Manchester. Larger and more specialist hospital units have been associated with reduced mortality, (in-hospital, 30-day, and one-year), perhaps because larger or higher volume hospitals are more likely to provide review by a stroke consultant within 24 hours and other processes usual in hyperacute stroke units. There is a HASU proposed in each of the options and this is supported by the available evidence. No scoring differential has been applied on this factor.

*A&E departments*

Overall, the review found no good quality research about clinical outcomes resulting from the exact total configuration of emergency services being considered by MSES. The two factors that repeatedly appear in the evidence review are travel times and appropriate levels of clinical workforce.

*Clinical workforce*

Reviews by the National Clinical Advisory Team have concluded: “The limited evidence available suggests that if services are centralised, there are risks to the quality of care where the centralised service does not have the necessary A&E capacity and acute medical support for the additional workload”. The workforce vacancy data shared with the Clinical Senate\(^{18}\) indicated that the region is not currently able to support three 24/7 emergency departments.

*Travel times*

If reducing the number of A&E departments that will take all cases results in substantially longer transfer times, this may impact on mortality, particularly death before arrival at hospital. Research about this does not compare minor versus major conditions or focus on GP referrals alone, but rather suggests that fewer non-elective A&Es in a region could increase mortality overall. Looking at travel time analysis shared with the Clinical Senate\(^{19}\), emergency travel times by car are least impacted in options 1C, 1A and 2A and therefore these options have been rated higher accordingly.

When scoring, this resulted in option 1B receiving least points as it has a relatively large impact on travel times without maximising the benefits of centralisation. Option 2A and option 1C were the preferred options with option 2A slightly ahead given the evidence on centralisation is of a higher quality than that relating to travel times.

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\(^{18}\) Report to the clinical senate panel, September 2016, Pg 13

\(^{19}\) Report to the clinical senate panel, September 2016, Pg 236 - 240
Stage two guidance review
The primary source of guidance comes from the urgent and emergency care review, known as the Keogh review\textsuperscript{20}. Keogh recommends working in a networked way that encourages specialisation, splitting of elective and emergency work and the clear labelling to patients. Other guidance reviewed\textsuperscript{21} refers primarily to clinical workforce levels, key times on a clinical pathway (e.g. time to assess) and related infrastructure. Clarity of naming units to support patients making informed choices was also raised in the Keogh review. All options proposed are broadly consistent with national guidance or move towards achievement of guidance (e.g. clinical staffing levels) and therefore all options are scored six or above.

Clinical workforce
Information provided to the Clinical Senate\textsuperscript{22} indicated there was insufficient consultant numbers\textsuperscript{23} to run two 24/7 emergency departments. Options 1A, B and C include three emergency centres whereas options 2A and 2B include one local emergency centre. Therefore, options 2A and 2B have scored higher on the assumption that this is more likely to strengthen current staffing levels. This is aligned to comments made in the Clinical Senate report\textsuperscript{24} which questioned the impact that option 1 would have on clinical staffing levels.

Clinical interdependencies
The national clinical guidance for Stroke services\textsuperscript{25} recommend that a hyperacute stroke unit provides immediate access to tertiary services for endovascular therapy, neurosurgery and vascular surgery. Given the MSESR cardiovascular service is located with the hyperacute stroke unit in options 1A and 2A, these options have been allocated a higher score.

\textsuperscript{20} Urgent and emergency care review: end of Phase 1 engagement report. Published by NHS England
\textsuperscript{22} Submission to the clinical senate panel, September 2016, Pg 13
\textsuperscript{23} Based on recommendations from The College of Emergency Medicine, Emergency Medicine Consultant Workforce Recommendations, 2013
\textsuperscript{24} Report of the Independent Clinical Senate Review Panels of 4 & 5 October 2016
\textsuperscript{25} National Clinical Guideline for Stroke, 2016
Emergency care scoring
The table below summarises the scores for each stage of the review, against all five proposed options.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Options</th>
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<th>1B</th>
<th>1C</th>
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<th>2B</th>
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Figure 5 Emergency care scoring

Assumptions that would impact upon scoring
- Due to the evidence on centralising emergency surgery and the link between mortality and volume being a higher quality than the travel time evidence, we have adjusted the weighting to take this into consideration.

- We used travel time information associated with all emergency admissions though some research is more specific regarding the clinical conditions who are more likely to be impacted by travel time increases e.g. respiratory distress. A more detailed review of emergency journeys by diagnosis codes may provide additional context and allow for a more nuanced judgement to be made.

- We have not applied a score for any options on the basis of clinical workforce levels as we have insufficient information as to which would provide the most appropriate rota cover. If MSES have a view on this and wish to include it, the scoring would need to be amended to reflect this.

- Our review of clinical interdependencies focussed on the specialist areas e.g. hyperacute stroke units. This was supplemented by a review of previous clinical interdependency reviews such as London and South East Coast Clinical Senate. It was based on a high level understanding of the models proposed and should be reviewed by the acute leadership group.

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

What the clinical evidence told us
Our initial scope excluded stage one evidence review for elective services, subsequently we were asked to review evidence for elective surgery. Due to time constraints, the review process has not followed the exact process as previous areas. We have completed a preliminary review of stage one evidence, focussed primarily on evidence collated in other reconfiguration proposals and evidence gathered from the other clinical work stream reviews.

There is some evidence that hospitals that conduct higher volumes of surgery have better outcomes though the means by which increased institutional volumes affect surgical outcomes are complex. Evidence also indicated that separating the elective surgical workload can improve efficiency and avoid cancellations.

How did the five models differ?
In the MSES proposal, under each reconfiguration option there are two elective surgical hospitals; either in each of the ‘amber’ hospitals (options 1A, 1B, 1C) or in the one ‘amber’ and one ‘yellow’ hospital (options 2A, 2B).

Points of differentiation focus on where a ‘yellow’ hospital is included, as this hospital would only take elective surgery cases with clear site separation from emergency surgery.

Reviewing the five options
Stage one evidence review
A British Journal of Surgery systematic review found that high-volume hospitals had significantly better outcomes in 74.2% of studies, but this effect was limited in prospective studies (40%) and high-volume surgeons had significantly better outcomes in 74% of studies. The benefit of high surgeon volume and specialisation varied in magnitude between specialities. High surgeon volume and specialisation are associated with improved patient outcome, while high hospital volume is of limited benefit. Therefore, any option which improves surgeon volume is likely to have a positive impact on patient outcomes.

Chard’s review into Independent Sector Treatment Centres (ISTC) supports the idea that separating elective surgical care from emergency services could improve the quality of care. The authors suggested this might result from a more predictable work flow, which would increase senior supervision of complex cases.

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27 A systematic review of the impact of volume of surgery and specialization on patient outcome, 2007 British Journal of Surgery
A review undertaken by Mayer et al\textsuperscript{29} suggested that segregation of elective and emergency services could be more efficient and lead to fewer cancellations. Though the work focussed on efficiency primarily, the reduction of cancellations may link to improved outcomes and certainly improved experience.

Options 2A and 2B as currently proposed will provide stronger separation of elective and emergency work and therefore these options have been allocated high scores than options 1A, B and C.

\textbf{Stage two guidance review}

The most common elective procedure in MSES is primary total prosthetic replacement of knee joint using cement (946 spells) with primary total prosthetic replacement of hip joint using cement (404 spells) in third place.\textsuperscript{30}

Getting it right first time\textsuperscript{31} suggested that if orthopaedic services, within a certain geographical area and with an appropriate critical mass were brought together, either onto one site or within a network, especially in the rural areas, and worked within agreed quality assurance standards, not only would patient care improve but billions of pounds could be saved. These hospitals or networks would receive recognition as ‘Specialist Units’, and have agreed ring-fenced elective beds allowing efficient throughput of patients treated to the highest standards.

Identifying minimum numbers in guidance and literature reveals discrepancies between what is considered an optimum number for key procedures. The British Orthopaedic Association\textsuperscript{32} identified:

- in primary hip arthroplasty, 35 cases performed annually is the ‘magic’ number, above which complications significantly reduce; and
- surgeons should be carrying out 20-30 unicondylar knee replacements per year.

Looking at quality data provided to the Clinical Senate\textsuperscript{33}, at the present time SUHFT report the highest number of elective activity for hip and knee replacements. All options excluding 1C would retain elective hip and knee replacement work, therefore this option scored less than other options.

\textsuperscript{29} Measuring and enhancing elective service performance in NHS operating theatres: an overview, Mayer et al, 2008
\textsuperscript{30} Submission to clinical senate, September 2016, Pg 205
\textsuperscript{31} Getting it right first time, September 2012
\textsuperscript{32} A national review of adult elective orthopaedic surgery, 2015
\textsuperscript{33} Submission to the clinical senate, September, 2016
Elective surgery scoring

The table below summarises the scores for each stage of the review, against all five proposed options.

<table>
<thead>
<tr>
<th>Options</th>
<th>1A</th>
<th>1B</th>
<th>1C</th>
<th>2A</th>
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<td>6</td>
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<tr>
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<td>6</td>
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<tr>
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Assumptions that would impact upon scoring

- Other common procedures are linked to specific sites as they are covered in the “givens” provided by MSES R.
- There is likely to be a ceiling of activity above which marginal gains in quality will be minimal. There was no evidence we found which provided definitive numbers regarding this.
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