

<b>Gateway Reference: 13140</b>	<b>Richmond House</b>
To: SHA Flu Lead Directors	79 Whitehall
Cc: SHA Flu leads	London
SHA Medical Directors	SW1A 2NS
SHA Nurse Directors	020 7210 4340
	<a href="mailto:ian.dalton@dh.gsi.gov.uk">ian.dalton@dh.gsi.gov.uk</a>

Dear Colleague,

2 December 2009

### **Advice from the H1N1 Critical Care Clinical Group**

As part of the work to help the NHS in England respond to the demands placed on it by the H1N1 pandemic, a Critical Care Clinical Group (CCCG) was set up chaired by Dr Judith Hulf, CBE the former president of the Royal College of Anaesthetists. The other members of this group include medical, nursing and NHS management colleagues as well as representatives of the British Association of Critical Care Nurses, the British Association of Perinatal Medicine, the Paediatric Intensive Care Society and the Intensive Care Society.

The terms of reference of this group include offering advice on how the NHS should best surge adult and paediatric critical care capacity, as well as considering and advising on management, staffing, equipment, medicines and consumables issues associated with the increase in demand for critical care services to help front line staff deliver these services in a surge situation.

The Group has received feedback on the extensive work that has been done already by individual organisations, critical care networks and Strategic Health Authorities to develop and refine plans to surge critical care capacity, if required, during the pandemic. I also recognise that a great deal of effort has been put into to preparing the NHS for what would be extraordinary circumstances. You and your colleagues are to be congratulated on this.

The current wave of the pandemic, although putting pressure on services, has not required us to implement plans to surge critical care capacity. However, we still need to prepare for how the pandemic may develop in 2010 as well as the impact of winter on critical care services.

A doubling of capacity would be unusual circumstances and the Clinical Group continues to receive representations from clinical colleagues on issues associated with support to staff, triage and the role that can be played by

extracorporeal membrane oxygenation (ECMO). In addition the Group has discussed the importance of ensuring adequate supplies during a surge situation.

Attached to this letter are four documents prepared by the Clinical Group that address these issues. These documents have been developed to support the NHS in ensuring that critical care arrangements are strengthened during both the current H1N1 pandemic and any future, potentially more serious, pandemic strain. The Group acknowledges that much detailed planning will already have been undertaken but these documents may provide a useful cross reference for local clinicians and managers. They should be seen and used in this context, both to refine as appropriate existing H1N1 critical care surge plans and to look to develop future critical care pandemic surge plans in the light of this clinical and logistical advice.

The attachments are:

Annex A: a note on principles for nurse staffing within critical care. A surge may require changes to the traditional methods of staffing ICUs and PICUs and the note seeks to provide guidance for nursing staff on the professional issues that may need to be addressed in a surge period;

Annex B: a note on triage that sets out the importance of distinguishing between normal clinical decision making and triage, emphasising that the latter should only be undertaken after the steps to surge capacity set out in local plans have been taken. Key elements are providing advice within clinical networks, setting up multi-speciality and team decision making arrangements and rehearsing these ahead of a surge.

Annex C: a note on the role that extracorporeal membrane oxygenation (ECMO) can play in the current pandemic. Additional context on the therapies available to local and regional ICUs is included and so this note now replaces the one emailed to you on 11 November 2009.

Annex D: a supplies checklist which sets out the issues the Group believe should be addressed by individual units to prepare themselves to double capacity if needed, including the issue of caring for children on adult ICUs.

I would be grateful if you could arrange for these documents to be circulated quickly to critical care networks and lead critical care contacts within your local provider organisations as well as to NHS Medical and Nursing Directors within your SHA. I must emphasise that the supplies checklist is a reference document for use locally; there is no need for any reports back to SHAs or the Department of Health against it. This would of course not stop any colleagues feeding back their comments on any of these documents if they wished.

In addition, we have been discussing the issue of ensuring the resilience of national and local supply chains during the pandemic. The fifth attachment to this letter, at annex E, is a short note on ensuring supplies resilience. It asks for confirmation that there is a strategy developed within your SHA for

engagement with the supplier network and that a dialogue with suppliers is in hand to ensure that the implications of a doubling of critical care capacity has been addressed. I would be grateful if you could respond on the issues raised in Annex E to Lt. Col. Ed Blight by Friday 17 December 2009.

If you have any issues on annex E then please raise them with Lt. Col. Ed Blight ([ed.blight@dh.gsi.gov.uk](mailto:ed.blight@dh.gsi.gov.uk)) in the first instance and if there are issues with the four products from the Critical Care Clinical Group then please raise them with Colin McIlwain ([colin.mcilwain@dh.gsi.gov.uk](mailto:colin.mcilwain@dh.gsi.gov.uk))

Yours sincerely,



Ian Dalton  
National Director of NHS Flu Resilience  
Department of Health

## H1N1 Critical Care Clinical Group

To: Ian Dalton,  
National Director  
NHS Flu Resilience  
Department of Health

30 November 2009

Dear Ian,

### **PRINCIPLES FOR NURSE STAFFING IN A CRITICAL CARE SURGE**

1. During the current pandemic of H1N1 flu, a Critical Care Clinical Group has been convened to offer advice and support to NHS colleagues on the practical implications of surging critical care capacity, if required. The membership of the group is drawn from medical and nursing colleagues working in neonatal, paediatric and adult intensive care services as well as representatives of the British Association of Critical Care Nurses, the British Association of Perinatal Medicine, the Paediatric Intensive Care Society and the Intensive Care Society.
2. This document has been produced to assist critical care staff in different and difficult circumstances. It is acknowledged that as experience with pandemic influenza develops the document will require change and updating. The current wave of the pandemic although putting pressure on services has not required the NHS to implement plans to surge critical care capacity. However, we still need to prepare for how the pandemic will develop in 2010 as well as the impact of winter on critical care services. Equally, the advice from the group will help with longer term planning for pandemic influenza preparedness.
3. During a surge of influenza patients there will be a requirement to change from the traditional methods of nurse staffing due to an increase in bed capacity, acuity of patients, change in patient groups (i.e. paediatrics in adult Intensive Care Units or vice versa) and staff absence. This document provides nursing staff with principles and ways to consider effectively deploying nursing staff to deal with a surge in critical care capacity. It should be read alongside the existing Department of Health guidance on Demand and Capacity (Surge) published in May 2009<sup>1</sup>, the Critical Care Strategy published in September 2009<sup>2</sup> and Pandemic influenza: additional measures to meet workforce supply published in October 2009<sup>3</sup> as well as the statements of the bodies listed in paragraph 16 below.

### **Aims**

4. This document aims to:
  - assist with nursing staff deployment within adult and paediatric critical care during a surge in critical care capacity.
  - provide guidance for nursing staff on the professional issues that may affect them in this period of extraordinary circumstances

### **Potential groups of staff to provide critical care nursing**

5. During peak periods it is envisaged that non-Intensive Care Unit (ICU) staff will be required to deliver nursing care under the supervision of ICU trained nurses. It is also envisaged that there will be an increased need for the paediatric patient to be cared for in adult ICUs, an area unfamiliar with caring for the critically ill child in the long- term.
6. The types of staff available to care for the critically ill may be categorised as follows:
  - ICU/Paediatric Intensive Care Unit (PICU) trained nurses. Experienced registered ICU/PICU nurses – staff currently employed in a critical care unit, with varying experiences in years and training.
  - Non-ICU trained nurses. Registered nurses with previous critical care experience or some transferable skills (e.g. anaesthetic/recovery/operating department practitioners/high dependency staff), provided with recent refresher critical care training.
  - Assistants/Helpers. Including trained critical care assistants, healthcare assistants, respiratory physiotherapists, other nurses & healthcare professionals with no critical care skills.

### **Nursing staff deployment**

7. A flexible and pragmatic team approach, rather than a ratio approach, should be considered when deploying the team. Staff may be required to work outside their normal practices for an ad hoc short term basis. Any such changes will need to be supported by work to ensure that, as much as possible, nurses working in different ways than usual are competent to do what is expected of them and are appropriately supervised. Please see potential examples/scenarios below, please note that these examples are not exhaustive and that it is for individual units to determine an appropriate mix of cases:
  - scenario one: one ICU trained nurse, two non-ICU nurses (from e.g. recovery/anaesthetics) and one critical care assistant/healthcare assistant allocated to a group of 3-4 patients (three ICU adult patients and one HDU adult patient).
  - scenario two: two PICU trained nurses, one ICU adult nurse and one critical care assistant/Healthcare assistant allocated to a group of 3-4 patients.
  - scenario three: adult ICU nurse and a paediatric nurse (non-ICU) allocated to 2-3 paediatric patients in adult ICU.
8. A group of patients requiring ICU and/or HDU care may consist of a mix of adults and paediatrics.
9. Each critical care unit should provide a designated supernumerary nurse in charge on each shift for supervision, advice, support and coordination. A critical care matron/senior nurse should be identified to oversee the running of a new or established cohorted critical care area.

## Training

10. Non-ICU nurses must receive critical care training and preparation to work in the critical care setting. The critical care training should be organised and delivered by adult and paediatric critical care clinical nurses/educators.
11. Adult ICU trained must receive training on specific paediatric critical care to care for PICU patients. Update PICU training should be organised and delivered by the PICU critical care team. The aspects of care specific to paediatric ICU should include:
  - Physiological and psychological differences between children and adults
  - Recognising the critically ill child.
  - Critical care skills such as airway management, ventilation strategies, fluid/nutritional management & administration of medications.
  - Psychological care of the child and family including consideration of ethics and care of the dying child & their family.
12. Additional educational resources such as clinical contact details, clinical guidelines & educational packages should be easily available for nurses and AHPs working in unfamiliar situations i.e. the adult ICU nurse/team caring for the paediatric patient.
13. The Intensive Care Society (ICS) is also sharing examples of good practice being developed for medical, nursing and OD practitioners within individual NHS Trusts. Copies of these could be requested from the ICS whose website address is [www.ics.ac.uk](http://www.ics.ac.uk).
14. There is an expectation from the General Medical Council (GMC 2009),<sup>4</sup> the Nursing and Midwifery Council (NMC 2009), the Royal College of Nursing (RCN 2009), the British Association of Critical Care Nurses (BACCN 2009), staff side organisations<sup>5</sup> and NHS Employers (2009)<sup>6</sup> that employees working outside of their normal role will need to continue to work within their scope of competence and receive adequate training and supervision. This reinforces the importance of employers planning ahead of a surge to assess the skills profiles of their staff, identify staff that can be redeployed to critical care and to provide training. In a surge situation, it will be important to support redeployed staff by having systems in place to direct and support clinical questions. These can take the form of identified local lead clinicians, agreed clinical guidelines, telephonic support from lead centres and educational resources.

## Accountability and Responsibilities

15. It is acknowledged that a period of pandemic influenza will place extreme pressures and challenges to providing safe, effective, quality care to the critically ill patient. Registered nurses primary concerns will still be to act in the best interest of both patients and the public.
16. Guidance from the NMC, RCN and BACCN has outlined the responsibilities of nurses working in critical care environments. Therefore, nursing staff must adhere to the NMC position statement on the role of registered nurses and midwives during an influenza pandemic (15 October 2009)<sup>7</sup>. The RCN and BACCN have also released guidance on the care of the child in adult ITU during a flu pandemic (RCN/BACCN September 2009)<sup>8</sup> and a joint position statement on standards for nurse staffing in critical care (BACCN/RCN October 2009).<sup>9</sup>

## Annex A

17. Operating Department Practitioners' will adhere to the position statement set out either by the HPC (2009)<sup>10</sup> or the NMC based on who is their regulatory body.
18. Trust Policies should reflect and support the requirement to work in the extraordinary circumstances created by a pandemic but must be adhered to.

### Acknowledgements

19. I would like to thank the members of the group for their assistance in producing this note and in particular Annette Richardson, Nurse Consultant, Newcastle upon Tyne Hospitals NHS Foundation Trust and Fiona Lynch, PICU Nurse Consultant, Evelina Children's Hospital, Guy's and St. Thomas' NHS Foundation Trust, London.

Dr Judith Hulf CBE  
Chair  
H1N1 Critical Care Clinical Group

### Endnotes

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<sup>1</sup> Pandemic flu: managing demand and capacity in health care organisations (surge)  
[http://www.dh.gov.uk/prod\\_consum\\_dh/idcplg?IdcService=SS\\_GET\\_PAGE&ssDocName=DH\\_087733](http://www.dh.gov.uk/prod_consum_dh/idcplg?IdcService=SS_GET_PAGE&ssDocName=DH_087733)

<sup>2</sup> Critical care strategy  
[http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH\\_104977](http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_104977)

<sup>3</sup> Pandemic influenza: additional measures to meet workforce supply  
[http://www.dh.gov.uk/prod\\_consum\\_dh/groups/dh\\_digitalassets/documents/digitalasset/dh\\_106388.pdf](http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/documents/digitalasset/dh_106388.pdf)

<sup>4</sup> GMC web links  
[http://www.gmc-uk.org/GMP\\_in\\_pandemic\\_draft\\_23Oct09.pdf\\_snapshot](http://www.gmc-uk.org/GMP_in_pandemic_draft_23Oct09.pdf_snapshot)

<sup>5</sup> UNISON web link  
<http://www.unison.org.uk/healthcare/swineflu.asp>

<sup>6</sup> NHS Employers web links  
[http://www.nhsemployers.org/Aboutus/Publications/Documents/Pandemic\\_Flu\\_HR\\_Guidance.pdf](http://www.nhsemployers.org/Aboutus/Publications/Documents/Pandemic_Flu_HR_Guidance.pdf)

<sup>7</sup> NMC web links  
<http://www.nmc-uk.org/aArticle.aspx?ArticleID=3897>  
<http://www.nmc-uk.org/aArticle.aspx?ArticleID=3691>

<sup>8</sup> RCN web links  
[http://www.rcn.org.uk/newsevents/news/article/uk/rcn\\_issues\\_swine\\_flu\\_guidance\\_for\\_children\\_in\\_itu](http://www.rcn.org.uk/newsevents/news/article/uk/rcn_issues_swine_flu_guidance_for_children_in_itu)  
<http://www.rcn.org.uk/pandemicflu>

<sup>9</sup> BACCN standards for nurse staffing in critical care  
[www.baccn.org.uk/downloads/BACCN\\_staffing\\_document.pdf](http://www.baccn.org.uk/downloads/BACCN_staffing_document.pdf)

<sup>10</sup> HPC web link  
<http://www.hpc-uk.org/mediaandevents/statements/swineflu/>

## H1N1 CRITICAL CARE CLINICAL GROUP

To: Ian Dalton,  
National Director  
NHS Flu Resilience  
Department of Health

30 November 2009

Dear Ian,

### PRINCIPLES TO SUPPORT PLANNING FOR TRIAGE

#### Background

1. NHS colleagues have expressed concern about the process for allocating scarce clinical resources in the face of increased demand during the current H1N1 pandemic.
2. The Critical Care Clinical Group (CCCG) has been tasked to provide practical advice for clinicians and organisations to prepare and test plans to achieve increased critical care capacity. We acknowledge that the aim of all providers is to maintain as high a standard of care as is achievable for the critically ill during periods of excess demand in a pandemic.
3. In preparation for a situation where demand exceeds the expanded critical care capacity, the CCCG suggests the following principles to support the application of existing ethical guidelines locally within organisations. This document should be seen as iterative and may need to be updated in light of further experience from the current pandemic.

#### Triage

4. The topic of triage has been raised in a number of forums. Triage involves managing care where demand is outstripping resources. This is not the same as standard critical care clinical practice where decisions about whether or not an individual will benefit from intensive care are made every day.
5. Triage would involve making choices between patients who would all benefit from intensive care. This does imply however that all other measures (such as stopping elective work, expanding capacity, transfer within networks and transfer between networks), as set out in paragraph 5 above, have been exhausted. This situation has not been reached to date and it is not expected to be, based on the forward modelling of influenza H1N1.
6. The CCCG recommends that if triage has to be undertaken it is done by more than one experienced clinician, is fully documented and such processes are worked through in advance as set out in paragraph 14 below.
7. The intention is that, by robust action now within and between networks, triage will be avoided.

## Principles

8. As a first step, Strategic Health Authorities, critical care networks and individual NHS Trust and NHS Foundation Trust should have rehearsed their plans to achieve an expansion of critical care capacity.
9. There must be recognition within Trusts (clinical and managerial) of the requirement to cease elective activity when faced with increased demand in line with the guidance on responding to pressures developed by the Department of Health<sup>1</sup>. The following actions are likely:
  - Reducing or stopping elective surgical activity to reduce other calls on critical care;
  - Conversion of level 1 and 2 beds to level 3 beds;
  - Conversion of other areas - such as post operative recovery- to critical care.
10. This expansion will put demands on logistics which is why advice on supplies has been issued by the group through Strategic Health Authorities. This advice is now available on the Department of Health website<sup>2</sup>. It may require staff to work outside their normal area or supervise individuals less familiar with managing critical care patients. Guidance on principles to support this can also be found on the Department of Health web site along with workforce guidance from the Department .<sup>3 4</sup>
11. A possibility is that paediatric patients may need to be cared for in adult units. Advice on training and process can be found on the Paediatric Intensive Care Society website including specific guidance on managing very sick children in a pandemic<sup>5</sup>.
12. The decision to admit a patient into critical care, with or without H1N1 infection, is a clinical one. This takes into consideration many factors but especially the likely benefit (or otherwise) to that individual from critical care. This is not triage- but is standard critical care practice based on clinical prioritisation.
13. As all critical care clinicians may not be familiar with the likely clinical course of severe H1N1 in all patient groups it is strongly recommended that local networks offer support and advice on a 'hub and spoke' basis. Arrangements within networks should be in place to identify clinicians with expert knowledge on H1N1 and/or advanced respiratory support techniques, who can act as clinical advisors to their network colleagues. This clinical advisory service should be available at all times.
14. UK experience to date has been that H1N1 cases have been 'clustered' putting particular hospitals, units and services under pressure while adjacent services have been untouched. This is why the CCG is emphasising the role of Networks and SHA Flu leads in managing and sharing this additional demand. Networks need to actively manage how patients are distributed between units and be aware of the impact on individual units. Arrangements must be confirmed for collaborative team working with regard to:

## Annex B

### Paragraph 14 (continued)

- Sharing increased demand using robust mutual aid and transfer arrangements within networks and between neighbouring networks, including those in bordering Strategic Health Authorities.
  - The set up of decision making groups within and across organisations. The membership should be drawn from across clinical specialties and services provided by the organisation. This group should meet and rehearse its approach to decision making in advance of any surge in activity. These arrangements need to be not only confirmed, but to have been rehearsed.
15. Severely ill patients with H1N1 may present complex management challenges including ventilatory challenges. The CCCG is emphasising the role of tertiary units in providing advice and guidance on the management and transfer of these patients. This includes the role of IV antivirals and the role of oscillation and Extracorporeal Membrane oxygenation (ECMO). These must all be seen as part of a holistic approach and not as individual isolated therapies. The CCCG view is that management of such complex patients should be in conjunction with tertiary centres so that decisions on use of oscillation and ECMO can be made appropriately. Arrangements must be confirmed within individual Trusts and networks for the review of patients whose suitability for critical care is being assessed. A team approach is recommended.
16. Links to the existing Department of Health documents referencing triage are given at the end of this note.<sup>6 7</sup>
17. The Group suggests that the relevant Royal Colleges and Associations, in conjunction with critical care networks, consider arranging Continuing Professional Development events on this issue to ensure that the key messages are discussed in all units, especially those currently with limited or no involvement in providing critical care or who might have to admit patients who currently would be treated in a regional adult or paediatric ICU.

Dr Judith Hulf, CBE  
Chair  
H1N1 Critical Care Clinical Group

## Annex B

### Endnotes

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<sup>1</sup>Critical care strategy: Managing the H1N1 pandemic

[http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH\\_104977](http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_104977)

<sup>2</sup>Critical Care Clinical Group: Supplies to support surging of critical care capacity  
URL to be added and this document will then be updated on DH website.

<sup>3</sup> Critical Care Clinical Group: Principles for nurse staffing in a critical care surge  
URL to be added and this document will then be updated on DH website.

<sup>4</sup> Pandemic Influenza: additional measures to meet workforce supply

[http://www.dh.gov.uk/prod\\_consum\\_dh/groups/dh\\_digitalassets/documents/digitalasset/dh\\_106388.pdf](http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/documents/digitalasset/dh_106388.pdf)

<sup>5</sup>Paediatric Intensive Care Society: managing very sick children in a pandemic - triage

<http://www.ukpics.org/images/stories//pics%20briefing%20ver%203%204nov%2009.doc>

<sup>6</sup>Pandemic flu: managing demand and capacity in health care organisations (surge)

[http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH\\_098769](http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_098769)

<sup>7</sup>Responding to pandemic influenza: The ethical framework for policy and planning

[http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH\\_080751](http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_080751)

## **H1N1 Critical Care Clinical Group**

### **ECMO sub-group Statement November 2009 (revised 23 November)**

1. In September 2009, the Department of Health received advice from a sub-group of the Critical Care Clinical Group, chaired by Dr Judith Hulf, on the potential for extracorporeal membrane oxygenation (ECMO) to contribute to the NHS response to the current pandemic of influenza H1N1. This advice involved doubling of the capacity for adult respiratory ECMO available in the UK from the five beds then available at University Hospitals of Leicester (UHL) NHS Trust (Glenfield Hospital).
2. The context for this is the nature of the respiratory failure being seen during the current H1N1 pandemic and the scope for ECMO to be used for adults and children in severe respiratory failure during the current pandemic.
3. Severe respiratory failure requiring mechanical ventilation can be categorised by severity of the compromise of either oxygenation or ventilation. Patients with refractory hypoxaemia carry the greatest risk of death and can prove the most challenging to treat. There are a number of different treatment options available for this group of patients, with differing levels of evidence base to support their use. These include prone ventilation, the ARDSnet strategy of low volume ventilation and permissive hypercapnia, high frequency oscillation ventilation (HFOV), ECMO and modalities to enhance matching of ventilation and perfusion such as inhaled nitric oxide or nebulised prostacyclin.
4. No single treatment confers guarantees of universal patient benefit and consequently treatment plan are the responsibility of experienced Intensive Care Medicine consultants. Each intervention needs to be evaluated by the potential risks and benefits to individual patients before the most appropriate treatment(s) are selected. Some treatments are more efficacious in certain age groups. ICUs with limited experience of caring for patients with refractory hypoxaemia should seek advice and assistance if necessary from other units with more experience in this field. No one treatment is a panacea to survival.
5. Since September the incidence of H1N1 in the population has continued to grow and the numbers of people being hospitalised with H1N1 as well as those needing critical care has risen. Demand for ECMO has grown and the capacity at Glenfield Hospital has been increased as a result. ECMO is a very staff intensive activity requiring twice as many staff for each ECMO patient than for those cared for in a

## Annex C

level 3 intensive care bed. Glenfield Hospital currently is able to staff eight ECMO beds.

6. In order to achieve the doubling of capacity that was recommended, the body responsible for funding ECMO – the National Commissioning Group (the NCG) – assessed whether hospitals in the national heart and lung transplant programme, who provide ECMO as part of that service, could develop a respiratory ECMO service during the current pandemic. The identified standard for respiratory ECMO is that delivered by Glenfield Hospital.
7. The NCG has carried out a quality assurance process to review the potential of the Royal Brompton and Harefield NHS Foundation Trust and the Papworth Hospitals NHS Foundation Trust providing additional ECMO capacity during the current pandemic to the standards established by Glenfield Hospital. As a result, the NCG is now commissioning 2 beds from each hospital. Glenfield is acting as the gatekeeper for this additional capacity and is working closely with the other two hospitals. Consequently, there are now 12 adult respiratory ECMO beds available in the UK.
8. The Critical Care Clinical Group's sub-group was reconvened on 4 November 2009 to take stock of the position given the current stage of the pandemic and the steps taken at Glenfield, the Brompton and Papworth. Its recommendations are listed below.

### General

- All ECMO must be provided to the Glenfield 'Gold Standard'
- The provision of ECMO beds should be a UK resource as are the other nationally commissioned services

### Immediate

- Any increase in provision in the current wave needs to be rapid (2-3 weeks)
- This is too short a timescale to consider new respiratory ECMO centres
- Therefore only those units already providing adult ECMO (Glenfield, Brompton, Papworth) should be considered for expansion
- The NCG will consult with Brompton and Papworth about possible increase in beds
- Glenfield should be supported at the current 8 active ECMO bed level in order that they are able to maintain their central gate-keeping, advice and training role
- There is no demonstrated need in the current wave for increased paediatric provision
- The burden of supporting an ECMO service (transport, staff support, dispersing other clinical load) should be spread beyond East Midlands SHA

## Medium Term

- Geographical spread should be considered in the commissioning of additional ECMO centres to minimise transport burden
- Only those centres already providing ECMO as part of the nationally commissioned heart and lung transplant service and bridge to transplant service should be considered.
- From a commissioning perspective – Birmingham, Manchester and Newcastle are currently commissioned by the NCG to provide heart and lung transplantation and bridge to transplant that includes the use of ECMO. These centres should be considered as potential additional centres of surge capacity for adult ECMO if it were to be required. It was agreed that the NCG should make contact with these centres to establish their willingness and ability to provide this if required to. They would need to be (a) prepared to offer surge capacity ECMO and (b) able to do it, which would include staffing capacity and impact on other resources, and (c) undergo the quality assurance process previously described using Glenfield gold standard to bring them to a state of preparedness. There might be training requirements that would need to be identified.
- For Scotland, a similar approach (using the framework and quality assurance) should be applied. Ministers and NSD Scotland to be consulted and agreement sought

## Longer Term

- The sub-group noted that the National Commissioning Group has set up a process to determine the possible future designation of adult ECMO units in England beyond the current pandemic. This will be taken forward in the remainder of 2009 and into 2010, giving NHS Trusts the opportunity to express an interest in being designated as an ECMO unit as part of the longer term provision of this service.

## Background

The group recognised that the current expanded ECMO capacity now available for adults was: Glenfield (8), Brompton (2) and Papworth (2). This would leave a maximum capacity for adults currently at 12 beds.

In addition, there are beds available in  
Sweden 2

There are Paediatric & Neonatal facilities available at:

GOSH	3 (3 paediatric and neonatal)
Glasgow	4 (2 paediatric and 2 neonatal)
Freeman	2 (2 paediatric and neonatal)

H1N1 Critical Care Clinical Group  
11 November 2009 (with revisions 23 November 2009)

## H1N1 Critical Care Clinical Group

To: Ian Dalton,  
National Director  
NHS Flu Resilience  
Department of Health

30 November 2009

Dear Ian,

### **SUPPLIES TO SUPPORT SURGING OF CRITICAL CARE CAPACITY**

#### **Background**

1. During the current pandemic of H1N1 flu a Critical Care Clinical Group has been convened to offer advice and support to NHS colleagues on the practical implications of surging critical care capacity, if required. The membership of the group is drawn from medical and nursing colleagues working in neonatal, paediatric and adult intensive care services as well as representatives of the British Association of Critical Care Nurses, the British Association of Perinatal Medicine, the Paediatric Intensive Care Society and the Intensive Care Society. The following information has been prepared for colleagues leading and managing critical care services.
2. It is not formal guidance nor is it a performance management document but has been developed as a reference to assist local planning. It should be read alongside the existing Department of Health guidance on Demand and Capacity (Surge) published in May 2009<sup>1</sup> and the Critical Care Strategy published in September 2009<sup>2</sup>.
3. It is acknowledged that individual units and critical care networks will have already carried out work to assure themselves of the supplies issues that they need to address. However given the likely impact of the pandemic on critical care services, especially for children, and the challenge that would be involved in achieving a doubling of capacity the members of the group wished to offer advice that can be used to double check existing preparedness. We would be grateful if this note could be circulated to NHS organisations through the Strategic Health Authorities.

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<sup>1</sup> Pandemic flu: managing demand and capacity in health care organisations (surge)  
[http://www.dh.gov.uk/prod\\_consum\\_dh/idcplg?ldcService=SS\\_GET\\_PAGE&ssDocName=DH\\_087733](http://www.dh.gov.uk/prod_consum_dh/idcplg?ldcService=SS_GET_PAGE&ssDocName=DH_087733)

<sup>2</sup> Critical care strategy  
[http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH\\_104977](http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_104977)

### **The day's supply approach**

4. The Group encourages units and networks to adopt the approach known as “the day's supply”. This is process by which units identify their daily consumption per patient per bed, compare with store levels held normally, identify what would be needed in a surge situation, look at where they obtain stock from assess the speed and vulnerability of their supply chain and prepare their stock levels accordingly.
5. The important principle is that all units that may face the potentially challenging implications of a flu pandemic peak have considered all the essential equipment supplies and disposables that are routinely required, and factored into their planning process a method for accessing sufficient additional resources to at least double the normal maximum number of Level 3 beds.

### **Preparing for children being admitted to adult ICUs**

6. One potentially challenging aspect of local surge plans may be the necessity to provide care for significant numbers of children in general ICUs, with appropriate support from colleagues with paediatric expertise. As general ICUs may not routinely stock the range of different items required for the care of children then, without appropriate advanced planning, supplies' availability could add to staffing and clinical issues in such circumstances. Accordingly, this document addresses the implications for supplies that must be considered to prepare for the care of ventilated children in general ICUs during the peak of a pandemic.

### **Reference lists**

7. This document has three appendices:

Appendix A provides a list of general consumables and drugs used in critical care on a daily basis.

Appendix B provides a list of additional items identified as essential requirements for managing ventilated children in general ICUs

Appendix C provides a list of resuscitation equipment requirements

### **Supply chain resilience**

8. A priority for individual and network critical care services should be close liaison with the local SHA to explore the reliability of essential supply chains. This will need to address the robustness of these arrangements in extreme circumstances, for example, where significant numbers of staff may be compromised by flu-related problems or increased international demands. It will be important to reduce uncertainty or relevant concerns about aspects of supply chains. In order to maximise efficiency and minimise the potential financial implications these issues should ideally be addresses on a network basis in accordance with agreed regional policies for providing core intensive care requirements,

## Annex D

9. Responsibility for the provision of resources or supplies to meet a requirement to surge critical care capacity, if needed, rests with local organizations working through critical care networks and with leadership from Strategic Health Authorities. To ensure resilience of supplies it is important that local plans are discussed with NHS Supply Chain or local supplier networks to identify whether or not they are sustainable in terms of pharmaceuticals, consumables and other products required to deliver the totality of critical care. It is important that suppliers have information on which to base an increase in their stock holdings to meet the anticipated surge and that these estimates reflect local needs for the supplies that would be consumed when critical care capacity is doubled. A need exists to identify regional and local supplier networks and to share your plans with them so that suppliers can work with you in delivering the escalated level of support you require. By the same token, you will need to work with the same supplier network to manage the process of de-escalating effort and thus maintain positive working relationships.

### Equipment issues

10. Where plans include the following issues then it is important that they have been tested and local actions identified:

**Using reserve ventilators** Where ICUs are planning to use ventilators that have been kept in storage after being replaced then there should be attention to ensuring that mothballed equipment has been recently serviced and that any specific equipment required for their re-use is available in sufficient numbers to enable repeated usage. As current staff may not be familiar with this equipment there should be arrangements made to update training, and also provision of appropriate paperwork instructions.

**Using equipment from outside ICUs** If introducing equipment and devices that are not normally used by existing critical care staff there should be systems created to provide appropriate update training sessions. This could include instructions in the use of anaesthetic machine ventilators, theatre monitoring equipment, differing infusion devices and renal replacement therapy machines.

**Acquiring age related supplies** For units that do not normally provide care for ventilated children, or those who may have existing paediatric services but who may have to provide care for much younger children, it is advised that there should be direct communications with the local PICU service to ensure that equipment and supplies are acquired in accordance with agreed local policies.

**Age compliance for ventilators** In order to ensure reasonable preparation for managing ventilated children, general ICUs should ensure that the appropriate age-compliance of their existing (and reserve) ventilators are identified. In circumstances where alterations or additional equipment may be required to enable ventilation of smaller children these should be considered or purchased where appropriate.

**Use of neuromuscular agents** For general ICUs caring for children, the principles on the usage of neuromuscular paralysing agents (with appropriate sedation levels) would need to be considered, for example in situations of extreme demand. Although it should be clarified that this concept is not being particularly advocated, it is probably pragmatic that sufficient supplies of muscle relaxants are prepared on this basis.

**Blood sample containers** In ICUs it is important to raise awareness of the necessity to use appropriate paediatric blood sample containers. These should be included in the supplies process, with appropriate paperwork to enable staff to select the correct ones for any blood samples taken.

**Fluid delivery** If the total number of patients ventilated (including children) results in there being insufficient infusion pumps available to deliver essential medications it may be necessary to revert to burette fluid delivery for children. These should therefore be included in the equipment work. As intensive care staff may be relatively unfamiliar with burette administration then training – with appropriate printed guidance – should be provided by experienced paediatric nursing colleagues.

### **Connection to regional PICU services**

11. Addressing supplies issues for children on adult ICUs needs to be supported by close links with regional PICU services to ensure that as far as reasonably possible locally agreed treatment policies are adhered to. Regional protocols for drug infusion concentrations (e.g. inotropes, vasopressors) and preferred treatment strategies (e.g. fluid therapy, insulin infusions etc.) should be distributed electronically and in printed format, with spare copies being readily available to ensure that staff can access this information whenever required.

Dr Judith Hulf CBE  
Chair  
H1N1 Critical Care Clinical Group

## Appendix A

### CRITICAL CARE CONSUMABLES\*

\* Text in *italics* indicates that a full range of appropriate sizes will be required

#### Ventilator-related

- Airway tubes
  - *tracheal tubes*
  - *tracheostomy tubes, fenestrated/non fenestrated*
- Circuits
  - catheter mounts
  - ventilator circuits; various types for use on all types of ventilators
  - filters for different types of ventilation
  - PEEP valves
- Suction
  - *suction catheters*
  - *closed suction*
  - Yankauer suckers
  - suction tubing
  - suction liners
- Other
  - Magill forceps (if single patient use)
  - laryngoscopes (if single patient use)
  - stylet (if single patient use)
  - bougie (if single patient use)
  - *oxygen masks: facial, bucket, tracheostomy masks & nasal cannula*
  - oxygen tubing
  - *NIV and CPAP masks, facial and nasal*
  - nebulisers, face mask & T-piece
  - nebuliser adapters
  - sputum traps
  - *non-rebreathable masks*
  - *hand-ventilation sets*
  - tracheostomy tapes
  - tracheostomy dressings
  - sterile preparation packs for all invasive procedures
  - *percutaneous tracheostomy kits*
  - *chest tubes and drainage system/bottle*
  - *airways*
  - oxygen diluters and tubing if used for humidified masked oxygen
  - *face masks for Ambu bags*

## Annex D

### Medical Gases

In existing Level 3 and Level 2 facilities as well as theatre or general ward areas that may be used for critical care during a surge:

- Oxygen
- Air
- Nitric oxide

### Vascular access and monitoring related

- Intravenous
  - *cannulae*
  - *central venous catheters*
  - *hypodermic needles*
  - IV administration sets (blood, fluids, drugs)
- Arterial
  - *cannulae*
  - insertion line packs
  - pulmonary artery catheters/cardiac output probes and sets (if used)
  - pressure bags
  - transducers sets
  - *Luer lock syringes*
  - arterial blood sampling syringes
  - closed blood sampling system
- General
  - blood culture bottles
  - blood lancets
  - bungs white & red
  - 3 way taps
  - extension sets (e.g. Octopus)
  - *IV dressings*

### Haemofiltration (CVVH)

- Haemofiltration devices
- All disposable equipment and consumables dependent on local facilities, including
  - Line sets
  - Filters
  - Filtrate bags

## Annex D

### Nutrition

- Enteral
  - *nasogastric (large and fine bore)*
  - *naso-jejunal feeding tubes*
  - feeding bags and giving sets
  - feed
  - bile bags
  - *enteral syringes*
- Parenteral
  - TPN feeding lines
  - PIC lines
  - insertion kits in accordance with local policies

### Patient Care

- General disposable
  - facial tissues
  - mouth care packs
  - hygiene solutions
  - slide sheets
  - patient wipes
  - incontinence pads
  - male urinal bowls
  - general bowls
  - wound drainage bags
  - bedpan liners
- Urinary / gastrointestinal
  - catheters (various sizes)
  - catheter bags
  - catheter insertion packs
  - bladder syringes
  - *incontinence drainage systems*

### Infection control

- PPE as per RCoA website
- Hygiene solutions
  - gloves
  - plastic aprons selection
  - surgical gowns
  - surgical masks
- FFP3 respirator
- Eye protection
- Waste management containers

## Annex D

### Miscellaneous

- *Non-sterile gloves*
- *Sterile gloves*
- Clinical waste bags
- Bag ties (if used)
- Hand towels
- Gauze
- Cotton wool balls
- Temperature probes
- Infected and non infected laundry bags
- Detergent wipes
- Blood bottles (U&E, FBC etc)
- Universal containers
- Sterile scissors
- Sutures
- Sterile gowns
- Dressing packs
- Defibrillator pads
- ECG dots
- ECG dots (12 lead)
- Sterile bowls
- Stitch cutter
- *Blades*
- *Tapes*
- *Disposable BP cuffs*

### Documentation

- Charts
  - observation and fluid balance
  - drug prescription
- Records
  - daily handover
  - nursing care, evaluation and management
  - medical management
  - discharge summary
- Request forms
  - laboratory
  - radiological
  - neurophysiology
  - psychiatry
- Labels
  - line
  - infusion
- Printer paper

## Annex D

### Drugs

Drug	Strength	Form
Actrapid insulin	100 units/10ml	Injection
Adrenaline	1:1000	Injection
Dobutamine	250mg/20ml	Injection
Fentanyl PCA	2.5mg/50ml	Syringe
Gelatin	4%	Infusion
Haemofiltration fluid	Accusol 35	Infusion
Heparin	25,000 units/5ml	Injection
Lansoprazole	30mg	Fastabs
Midazolam	50mg/50ml	Injection
Morphine PCA	50mg/50ml	Syringe
Noradrenaline	4mg/4ml	Injection
Omeprazole	40mg	Injection
Potassium Chloride	15%	Injection
Propofol	1%	Infusion
Salbutamol	2.5mg	Nebules
Salbutamol	5mg	Nebules
Sodium Chloride	0.9%	Infusion
Sodium Lactate (Hartmann's)	-	Infusion
Tinzaparin	3500 units/0.35ml	Injection
Vasopressin	20 units/1ml	Injection
Vecuronium	10mg	Injection
Water for Irrigation	-	Infusion
Ketamine		
Atracurium		
Enoxinone		
Antibiotics, e.g. Augmentin, clarithromycin		
Antivirals. e.g. Tamiflu		
Anticonvulsants		
Diuretics		
Anti-emetics		

### Additional Pharmacy Items

- Aquagel
- Water for humidification
- Sterile water (litre bottles)
- Water for injection (10ml ampoules)
- Saline for injection (10ml ampoules)
- 10% Glucose (500ml/1L bags)
- 20% Glucose (500ml/1L bags)
- Emergency drug boxes
- Renal fluids including C.V.V.H. fluid
- Clinell wipes
- Saline 500ml bags



## Annex D

<b>VENTILATORS:</b>	paediatric circuits if appropriate with humidification
<b>CHEST DRAINS</b>	Seldinger chest drains 12F Seldinger chest drains 20F Rocket chest drains
<b>IV &amp; CARDIOVASCULAR EQUIPMENT:</b>	cannulae 24G, 22G, 20G , 18G central lines (triple lumen) 5fr 15cm (>2yrs, femoral site) central lines (triple lumen) 5fr 8cm (6month -2 yrs) central lines multicath (triple lumen) 4.5fr 6cm (for children <6 months) hands-free defibrillator pads (child & adult)
<b>MONITORING :</b>	saturation probe neonate saturation probe paediatrics ecg electrodes baby 1.5mm non-invasive blood pressure cuffs & leads: neonatal size 2,3,4,5 transducer sets (as appropriate for use with local monitoring system) end-tidal CO <sub>2</sub> monitoring suitable for 4.5 or smaller TT
<b>FEEDING:</b>	feeding tube (6Fr -10Fr) infant formula (parents' preference)
<b>CARES:</b>	arm splints including elbow (freedom) snuggle wraps (newborn - large) and bed linen nappies urinary catheters (size 6,8,10, 12fr) eye care: gauze, sterile water, viscotears baby bath & wash mouth care: sponges, sterile water, vaseline, child toothbrush
<b>SAMPLES:</b>	blood sample mini-tube for collection (volume 1.3ml)

## Appendix C

### Resuscitation equipment [for both general and paediatric units]

<b>AIRWAY EQUIPMENT</b>	
Face masks	Size 00-4
Guedel oropharyngeal airways	Size 000-4
Laryngeal mask airways	Size 1-5
Laryngoscope blades	Miller 0
	Seward 1 & 2
	Mackintosh 0-4
Laryngoscope handles	with batteries
Magill forceps	
Tracheal Tubes	uncuffed size 2.5-9.0
	cuffed 2.5-4.0 low pressure
	cuffed standard 4.0-9.0
Lubricating gel	
Gum elastic bougie	Fr 5 & Fr 15
Intubation stylet	small, med, large
Yankauer sucker	paediatric & adult
Tracheal tube connectors	15mm compatible connectors
	catheter mount with swivel
Nasogastric tubes	size 6-12 Fr
Duoderm, extra thin	
Elastoplast tape (1 inch)	
Zinc tape (1 inch)	
Scissors	
<b>BREATHING CIRCUITS &amp; BAGS</b>	
High-flow oxygen masks with reservoir	paediatric & adult
Re-breathing circuits (Ayers T-piece)	500ml, 100ml, 2L
Self-inflating Ambu-bag	paediatric & adult
Nebuliser kit and adapters	
<b>MONITORING</b>	
ECG electrodes	paediatric & adult
End-tidal CO <sub>2</sub> monitor	small & large connectors
Saturation probes	soft paediatric & adult

Annex D

<b>RESUS DRUGS</b>	
Adrenaline (1;10,000)	
Sodium bicarbonate 8.4%	
Atropine	
Calcium gluconate	
Normal saline ampoules	
<b>VASCULAR ACCESS</b>	
Intra-osseous (IO) gun & IO needles	

**Department of Health**  
**NHS Flu Resilience**

To: SHA Flu Lead Directors

Date: 26 November 2009

**Ensuring supplies resilience**

1. This note sets out the approach being taken by the Department of Health with SHAs to secure supplies during the current pandemic. A key issue is ensuring that SHA planning processes include communicating their planning and activity assumptions with regional/local supplier networks.
2. As you know, there is no central initiative for the provision of resources or supplies to meet this requirement, with the exception of limited stockpiling of some consumables and antibiotics within the Department's Pandemic Influenza Preparedness stockpile. To date we realise that you will have conducted detailed planning to deliver a doubling of critical care over a sustained period of anything up to 12 weeks.
3. In achieving this, you will have worked with your Trusts to lease or purchase additional ventilators and identified resources for beds, nursing/care staff, medical engineering requirements for oxygen and the movement of critical care patients, to name but a few of the issues.
4. However, there is a real concern that, whilst detailed plans have been drawn up, these plans have not been shared with the NHS Supply Chain or local supplier networks to ascertain whether or not they are sustainable in terms of pharmaceuticals, consumables and other products you require to deliver the totality of Critical Care.
5. Nationally we know that suppliers are saying they have increased stock holdings to meet the anticipated surge, but their estimates may not have incorporated such issues as critical care doubling where the consumption rates for some products may quadruple in certain circumstances. A need therefore exists to identify your regional and local supplier networks and to share your plans with them so that Suppliers can work with you in delivering the escalated level of support you require.
6. By the same token, work will be needed with the same supplier network to manage the process of de-escalating effort and thus maintain positive working relationships.

## Annex E

7. The Department of Health is not advocating a stockpiling approach by SHAs or Trusts as this will cause significant problems across the supplier network both locally and nationally. What is required is constructive dialogue with each regional supplier network, however large or small that may be, in order to ensure that the detailed plans that you have developed are, in fact, sustainable.
8. We are conscious that supplier relations can be difficult in some circumstances as there are commercial sensitivities, among others, that have to be taken into consideration. I appreciate that when conducting engagement with suppliers that a balanced informative approach is adopted in order to not to create any misconceptions of what will be needed.
9. Engagement with the supplier network on a regional basis may ease potential pressures on both suppliers and the NHS particularly when it comes to increase of activity. Ultimately if suppliers are informed when escalation and de-escalation will take place then they will be in a position to scale their purchasing efforts to meet demand.
10. I would be grateful if you could confirm to Ed Blight ([ed.blight@dh.gsi.gov.uk](mailto:ed.blight@dh.gsi.gov.uk)) by 17 December 2009 that there is a strategy developed for engagement with your supplier network and that a dialogue with suppliers has been started along the lines set out in this note. Ed is happy to follow up any of the issues in this note with you

**Ian Dalton**  
**National Director**  
**NHS Flu Resilience**