Critical care contingency planning: phased responses and triaging framework

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As most of our readers will be aware from previous publications and from the special articles contained in this edition, a lot of work has gone into highlighting the implications of an influenza pandemic for critical care services and trying to work out how to make the best use of the resources that may be available. The latest Department of Health Document *'Pandemic influenza: surge capacity and prioritisation in health services – provisional UK guidance'* (available on the DH website) has made an encouraging start in providing official recognition of the problems likely to be encountered as a result of limited bed capacity, and also supports the concept that triaging decisions cannot be left to secondary care (and particularly critical care specialists) alone. Regrettably, however, even if its recommendations for patient selection are fully followed and the number of inappropriate referrals to critical care is reduced significantly, there is still a strong probability that during the peak of a pandemic the number of patients who are likely to benefit from critical care will still significantly exceed bed capacity – even if this is maximally expanded.

In the original working of the Critical Care Contingency Planning Group a draft document on Phased Responses and Triaging was produced as a starter to addressing these difficulties. Further work on this was then put on-hold pending the production of official ethical guidance and other documentation to address these problems. However, now that these have been finalised and we still face potential dilemmas about how ICUs will be able to cope, feedback from critical care network discussions has persuaded us that it may be useful to circulate a revised version of this document, updated to include more recent recommendations, in the hope that this may be of help in assisting local planning.

In particular, the document addresses two concepts that were initially felt to be inappropriate or unacceptable, but which now may be considered reasonable/realistic. These are the possibility of using some method of lottery selection if there are several appropriate referrals but insufficient bed numbers, and the fact that at some point there may be a requirement to accept temporary closure of intensive care to further referrals if no beds are available. It is hoped that consensus support for the principles of this document may help to produce reassurance for staff (with the support of local PCTs and Trust Management) that if potentially preventable deaths occur in such circumstances they will not be vulnerable to litigation or professional criticism when no other treatment options were available.

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Introduction

The planning process for an influenza pandemic has increased awareness that the relatively limited number and high occupancy rates of critical beds in the UK will require reliable and coordinated responses to increase capacity in order to maximise the number of patients who can receive mechanical ventilatory support. Organisational planning for maintaining/expanding critical care services for an influenza pandemic has the additional advantage that such preparation will improve preparedness for other events where demand for critical care beds substantially exceeds normal capacity. The requirement to increase critical care capacity, and to initiate other changes in critical care practice/organisation, will vary according to the type and severity of the causal incident. A phased response framework that can be activated according to either locally agreed trigger mechanisms or authorisation by designated clinical leads will help define the points at which changes from normal practice are required and should assist in justifying decisions which would be considered controversial in normal circumstances.

In circumstances when the demand for critical care beds significantly exceeds existing capacity, changes in the levels of critical care support that can be provided will also be inevitable. It is also likely that the current high standards of care provided will not be sustainable when services are increasingly dependent on the assistance of relatively inexperienced reserve staff and when the supplies of normal equipment and disposables may be compromised. Although

national guidance provided by the Surge Capacity and Prioritisation document[1] may help to reduce the number of inappropriate referrals, it is still likely that there will be episodes where the number of appropriate referrals significantly exceeds bed availability, despite maximal escalation of capacity. Local agreements will be required to determine how to make best use of available resources and how to decide which patients will receive mechanical ventilatory support. As there will inevitably be controversy over such decisions it is essential that the processes for decision-making are agreed in advance and are fully supported by SHAs, PCTs and Trust Management, and that there is full documentation of the decision-making processes.

Phased responses

Phase 0

Normal activity

Phase 1

- Cancellation of all elective surgical procedures requiring post-operative critical care admission
- Opening of 'closed' critical beds
- Expansion of nursing capacity by increasing agency or 'bank' shift support.
- Secondment of additional medical staff from 'elective' duties (e.g. anaesthesia) where necessary
- Discharge of suitable patients to other ward areas (with appropriate upgrade in medical/nursing support for these areas)
- Non-clinical transfer (if appropriate and capacity exists) to other critical care units
- Maintenance of existing nurse:patient staffing ratios.

Admissions to Level 3 critical care beds according to Stage 1 Triage Response

Phase 2

As for Phase 1 plus:

- Upgrading of existing Level 2 beds to Level 3
- Conversion of reserve critical care areas into Level 3 facilities (e.g. theatre recovery, HDU, SHCU, CCU)
- Creation of Level 2 facilities in other clinical areas (if required)
- Cancellation of annual leave for medical and nursing staff
- Cancellation of all non-urgent surgery
- Cohorting of index disease patients into specific clinical areas
- Deployment of reserve-trained critical care nursing/medical staff

Change in the critical care-trained nurse:patient ratios may be necessary – 1:1 ratio of nurse:patient target for all Level 3 patients, 1:2 for Level 2 patients

Admissions to Level 3 critical care beds according to Stage 2 Triage Response

Critical care interventions according to Stage 2 Triage Response

Phase 3

As for Phase 2 plus:

- Maximum use of all available Level 3 capacity
- Nurse:patient ratios according to local clinical leads' discretion
- Full recruitment of reserve-trained critical care nursing/medical staff

Admissions to Level 3 critical care beds according to Stage 3 Triage Response

Critical care interventions according to Stage 3 Triage Response

Phase 4

An event of catastrophic severity could result in complete or partial collapse of some or all hospital infrastructures.

- Specific planning is not feasible given the extent of possible scenarios
- Medical responses in such circumstances will be limited by the sustainability of personnel, equipment and environment
- It must be hoped that the process of planning for lesser phases will provide a basis for locally produced responses

Triaging

1. Existing guidance on expanding critical care capacity[2] recommends a target of a 100% increase from normal bed availability, but a number of organisations have produced plans which estimate an increase of up to 200%.
2. Despite such expansion plans, in circumstances where the potential number of referrals to critical care is likely to exceed bed availability, triage mechanisms are essential. Calculations based on the National Pandemic Influenza Framework[3] suggest that even if existing critical care bed capacity can be maximally escalated, during the peak of a pandemic there may be approximately 10 times as many patients requiring mechanical ventilatory support as the number of beds available.
3. In nationwide challenges such as a major infective epidemic or widespread bioterrorist event the principles that must apply are that:
   - Critical care is only provided for individuals who are most likely to benefit
   - Triage/treatment decisions are made on the basis of benefit for the greatest number of patients possible in accordance with the CEAPI ethical principles[4]
4. To encourage consistency and appropriateness of referrals and hence reduce the potential burden on critical care specialists, a Surge Management document based on the Sequential Organ Failure Assessment (SOFA) triaging system produced by Christian *et al*[5] has been produced by the Pandemic Influenza Planning Group.
5. Although created for an influenza pandemic it is logical to plan for use of this system in other events, unless additional information suggests that other methods may be preferable or may help by further refining selection criteria.
6. Despite a reduction in the numbers of patients referred by use of SOFA scale triaging it is likely that there may still be significant numbers of 'appropriate' patients who require mechanical ventilatory support with insufficient resources to provide this. In order to meet the required ethical principle of fairness, potential responses to such circumstances will therefore need to include consideration of:
   6.1. Whether assessment by experienced clinicians can

identify other criteria or conditions which may assist in prediction of patients who have not been excluded by SOFA scale assessment but are unlikely to have sustained benefit from mechanical ventilation.

6.2. Outcome/predictive clinical indicators which may become available from information accumulated during the evolution of the event.

6.3. Closing of critical care services when all available beds are occupied

6.4. Use of a 'lottery' system to select which patient will receive mechanical ventilatory support if/when a bed becomes available.

7. The decision to temporarily close critical care services to further referrals or to initiate a 'lottery' or other process of randomised patient selection for limited bed numbers should be based on local policies agreed in advance between Trust management and SHAs. The Medical Director/CEO should be involved in these decisions, with full records kept of the circumstances leading to them. The situation should be reviewed on a daily (or more frequently if appropriate) basis.
8. For patients in whom mechanical ventilatory support has already been initiated it is recommended that subsequent decisions (including treatment withdrawal) can be based on the SOFA triaging system. This is controversial and will add additional challenges to the responsibilities of critical care teams.
9. For patients with a low probability of survival, or for whom the predicted duration of critical care is likely to be such that many others will be consequently denied access to critical care, agreement will need to be reached on limits of treatment escalation and the point at which the priority of care changes to maintenance of comfort and dignity.
10. The necessity to triage critical care admissions using criteria which will differ from those used in routine clinical practice will cause controversial ethical issues and the prospect of litigation (in 'real time' or retrospectively) directed against clinicians responsible for these decisions. Triaging decisions should therefore be shared by at least two experienced consultants, and should be in accordance with local policies agreed with Trust management and SHAs. Full documentation of the decision-making process should also be recorded.
11. In order to help maintain staff morale and prevent the potential of either professional criticism or litigation, a national policy should be established that offers an appropriate degree of protection for those who find themselves having to provide care for patients outside their normal area of expertise or working with insufficient resources. In the absence of such a national policy agreements should be sought with local management teams and SHAs to provide reassurance and support for staff. Such agreements will not remove the responsibilities of staff to prioritise patient safety, but should ensure that they will not be vulnerable for doing the best that can be done under difficult circumstances.
12. Additional security measures may be necessary because of the risks of violence directed at staff making triage decisions.
13. The required strictness of triaging decisions will vary according to the scale of the problem and its geographical extent. The necessity for triaging patients will also be influenced if additional critical care capacity exists elsewhere and if transport logistics allow these to be accessed. Accordingly a staged triaging structure should be created, with the progression criteria being agreed by local consultation. The following recommendations may be helpful.

Staged triaging

Stage 0

Normal practice.

Stage 1

Stringent admission review for all patients referred. Level 3 care may be restricted on the basis of SOFA scale assessment or other identified clinically significant co-morbidities. Full medical and nursing supportive Level 2 care will be provided as appropriate, but cardiopulmonary resuscitation will not be attempted if this proves ineffective.

In Stage 1 Triage it may also be necessary to introduce escalation limits on critical care interventions undertaken in patients; thus in patients where Level 3 care has been initiated but physiological deterioration has continued despite full supportive care it may be appropriate to consider limiting the degree or duration of circulatory support, or not to initiate renal replacement therapy if renal failure cannot be prevented.

Stage 2

The principles of triaging are similar to Stage 1, but greater stringency will be required in deciding which patients should receive Level 3 care and the extent of the treatment interventions provided. Such decisions should be shared by two or more consultants, ideally both of whom should be experienced in critical care medicine.

Stage 3

Even with maximally expanded critical care capacity it will only be possible to treat a limited proportion of the patients who may require Level 3 care as it is likely that all available Level 3 beds will be in use as a result of a progressively increasing referral rate. As a consequence, many potentially preventable deaths may be inevitable. New referrals will only be able to receive Level 3 care if a bed becomes available because a patient has died, or recovered sufficiently to be discharged.

Staffing and equipment limitations will be such that critical care interventions will have to be restricted. Mechanical ventilation, fluid therapy (with or without inotropic/vasopressor support), intravenous antibiotics, and enteral nutritional support may be provided, but treatment will not be further escalated if deterioration occurs despite these interventions. In patients considered to be at risk of peptic ulceration H_2 receptor antagonist therapy may be considered appropriate.

The over-riding principle will be that only patients who are

thought to have a good chance of survival with a reasonable life expectancy should receive Level 3 care. In patients who progress to multiple organ failure despite full supportive care treatment interventions may have to be withdrawn, or non-escalation strategies agreed on the basis that other less sick patients are more likely to benefit from receiving Level 3 care. Use of the SOFA scale to assist in non-escalation/withdrawal decisions will ensure consistency for all patients.

The decision to withdraw or limit interventions earlier in the course of a patient's treatment than would be considered under normal circumstances is likely to cause distress to relatives and critical care staff, and the ability to continue functioning as a cohesive team will required careful attention to staff communication and morale.

As there is likely to be extreme distress, anger, and even a risk of aggressive behaviour from family and friends of those in whom withdrawal of treatment interventions must be considered, it may be advisable to rely on non-escalation (e.g. not commencing vasopressor support or renal replacement) in many situations. Lack of availability of drugs, equipment or expertise may independently restrict such interventions.

Nursing and medical resources are likely to be under such pressure that the normal standards expected of critical care will inevitably be compromised and hence close teamwork and mutual staff support will be of crucial importance. Failure to preserve staff morale is likely to lead to increased absenteeism, and consequently increase staffing problems and reduce bed availability.

Stage 4

An event which causes the collapse of some or all hospital infrastructures may render attempts to maintain a cohesive critical care response difficult or even impossible. It is unrealistic to plan provision of life-support interventions in the absence of adequate equipment, supplies, staff and a suitable environment. Under such circumstances the provision of intensive care must be regarded as a lower priority than more sustainable responses to preserve lives and reduce suffering of the wider public.

Conclusion

It should be clarified that this is still a *draft* version that is fully open for consultation, and it would be very helpful to have feedback from our members on its content or any suggestions for improvement. Please feel free to do this by either responding by letter to the editor of JICS, or by email to jics@healthplanning.co.uk.

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