Guidelines for the introduction of Outreach Services

STANDARDS AND GUIDELINES

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1 INTRODUCTION

1.1 The identification of the critically ill or deteriorating patient is the key to preventing admission or readmission to the critical care facility. 'Comprehensive Critical Care' published by the Department of Health in June 2000[1], recommended the use of guidelines, standards and protocols developed by multi-professional collaboration. NHS trusts are encouraged to develop appropriate Critical Care Services including the identification of all patients requiring level 1, 2 or 3 care throughout the hospital.

1.2 Outreach Services, developed as part of a trust-wide Critical Care Service, should have the following objectives:

- avert admissions to critical care
- facilitate timely admission to critical care and discharge back to the wards
- share critical care skills and expertise through an educational partnership
- promote continuity of care
- ensure thorough audit and evaluation of Outreach Services

1.3 Outreach Services should be part of the Critical Care Delivery Group.

2 SUMMARY

2.1 A need for Critical Care Outreach Services has been identified.

2.2 Outreach should be seen as part of a hospital-wide approach to critical illness in collaboration with other hospital departments.

2.3 The primary role of Outreach Services is to ensure that patients receive appropriate and timely treatment in a suitable area. Education and the re-skilling of ward staff in the recognition and basic management of patients developing critical illness should aid this process.

2.4 Adequate resources must be made available for outreach in addition to adequate ward provision.

2.5 The contribution to both undergraduate and postgraduate medical training and nurse training in the principles of physiological processes and critical care medicine must be enhanced. There should be particular emphasis on hospital trainees in acute specialties.

3 DEFINITION

3.1 Dictionary definition of Outreach:
'The extending of services beyond current or usual limits.'

3.2 Definition of Outreach as applied to Critical Care Services:
'The Critical Care Outreach Service is a multidisciplinary approach to the identification of patients, at risk of developing critical illness, and those patients recovering from a period of critical illness, to enable early intervention or transfer (if appropriate) to an area suitable to care for that patient's individual needs. Outreach should be a collaboration and partnership between the critical care department and other departments to ensure a continuum of care for patients regardless of location, and should enhance the skills and understanding of all staff in the delivery of critical care. In summary, outreach care is a partnership aimed at prevention by education and action.'

3.3 It is equally important to emphasise that a Critical Care Outreach Service is not a remedy for inadequate resource provision resulting in:

- too few critical care beds
- inadequate ward facilities to care for lower dependency patients
- decreased ward nursing numbers or inappropriate skills mix
- inexperienced trainee or lack of supervision

Neither should it assume the clinical responsibility for the care of all patients at risk of critical illness from other departments.

3.4 The outreach team should be prepared to take over or at least direct the care of critically ill patients whose admission to a critical care facility is delayed and are deemed inappropriate for transfer. These patients may be being cared for in areas such as the general ward. For this reason the outreach concept requires capital investment to enable it to set up a satellite service.

3.5 The physical and psychological consequences of critical illness may extend beyond ward follow-up and outreach does not replace the requirement for formal and long-term post-intensive care follow-up clinics and rehabilitation services.

4 BACKGROUND

4.1 Part of the executive summary of 'A Health Service of all the Talents; developing the NHS workforce'[2] emphasises the need to modernise education and training, to encourage team working and maximise the contribution of all staff to patient care. 'Guidance for Admission and Discharge of Patients from Intensive Care High Dependency Units' gives clear guidance on the system failures which require patients to be cared for in the critical care environment. The skills and education necessary for their management should be the foundation of the educational base of both doctors and nurses.

4.2 In a complex system such as healthcare delivery, there are a large number of factors and individuals involved that may influence outcome and inadvertently contribute to sub-optimal care. These conditions are often deep rooted in the organisation but can usually be identified and prevented. The ability to be honest and to learn from mistakes will enable an organisation to address the wider causes of failure[3].

4.3 It is inevitable that professionals working in critical care will see examples of sub-optimal care during their day to day work and such anecdotal evidence is very powerful. For example;

"A fit 78 year old man underwent an elective anterior resection for a benign stricture. Following surgery he was kept in recovery for two hours before returning to the general ward at 18:00 hours. He was fully awake, warm, pain-free and well perfused with a good urine output. By 21:00 he had become tachycardic and tachypnoeic, and his blood pressure had fallen with a poor urine output. An ECG showed no acute changes but a haemoglobin measurement showed anaemia. As there was no blood in the drain, a diagnosis of intra-operative myocardial infarction was made and frusemide given to try to improve urine output. The patient was returned to theatre urgently the next morning following the consultant ward round and a bleeding point identified and tied off. The patient spent several weeks in the intensive care unit in multiple organ failure requiring aggressive circulatory, respiratory and renal support. The patient died."

4.4 Published work has demonstrated physiological deterioration prior to cardio-respiratory arrest is either not recognised or inadequately treated[4-6]. Respiratory rate, heart rate and adequacy of oxygenation have been highlighted as indicators of critically ill patients on the general ward[7]. Unfortunately the monitoring and charting of physiologic variables, especially respiratory rate, is often erratic. Sub-optimal care has been demonstrated in patients prior to ICU admission and this may lead to increased morbidity and mortality[8].

4.5 Systems developed such as the Medical Emergency Team (MET)[9] and Patient at Risk Team (PART)[10] aim to replace the cardiac arrest team and hopefully to identify patients developing critical illness at an earlier stage and to get more experienced help earlier. Other hospitals have developed ward-based scoring systems such as the Early Warning Score (EWS)[11] and Modified Early Warning Score (MEWS)[12] to focus attention on worsening physiological parameters.

4.6 There are many reasons why the hospital system is failing these patients:

- Intensive care medicine (ICM) is recognised as a specialty in the UK and to date only anaesthesia requires a mandatory period of training in the management of the critically ill. Undergraduate as well as postgraduate training does not address the specific training and skills involved in patients with critical illness[13]. Changes brought about by the introduction of Calman reforms have led to a shortened training programme and more cross-covering of specialties, which may lead to less continuity of care for ward patients out of hours. Inexperienced medical staff may not respond appropriately to patients with critical illness.

- Inadequate nursing provision may lead to failure to focus on groups of patients at risk of developing critical illness and on occasions nurses may be unsure when to call for assistance[14]. The introduction of a diploma-style training for all nurses changed the emphasis in the curriculum. This resulted in a reduced level of clinical skills for newly qualified nurses, which has now been recognised and a new curriculum is being piloted with increased clinical time. In many areas there is recruitment and retention difficulties with medical, nursing and allied health professions staff which may result in inadequate skill mix or difficulty with the provision of services.

- Changes in delivery of health care such as the development of Surgical Day Case Units has altered the case mix of the inpatient population on surgical wards and also diverted nurses to areas outside the general ward environment. The resulting

ward patient population has become older and sicker as surgical, anaesthetic and critical care techniques have improved, leading to higher risk patients being offered surgical intervention. Indeed public expectation of access to treatment and interventions is now greater than it has been previously.

- Services are becoming increasingly specialised and this can lead to a de-skilling or lack of experience on the general wards. As a consequence of bed shortages patients may be cared for on inappropriate wards resulting in unfamiliarity with a patient's condition, other departments policies or protocols and which medical staff to contact.

- The demands made on the health system particularly over busy periods can lead to patients being cared for in inappropriate areas. This may lead to unfamiliarity with treatment protocols amongst staff and difficulty for medical teams to keep track of their patients.

4.7 The Audit Commission report 'Critical to Success'[15] highlighted the need for the critical care team to take part in the care of some patients prior to admission to critical care units – 'a pre-admission triage or 'outreach' role. This was reinforced by the Department of Health.

4.8 As with the early development of critical care, Outreach Services are being introduced in an ad hoc basis, with limited local experience of the processes involved. Resources have been allocated and many trusts have appointed medical, nursing and allied health professions staff into posts with responsibility for outreach. Local priorities will inevitably be the driving force behind these new developments. However there are many factors within trusts and also individual departments that will need to be taken into consideration when setting up an Outreach Service:

Organisational

- Size – there is a wide variation in the size of acute hospital trusts and also in the specialties provided.
- Geography – 'at risk' patients may be housed in relatively few wards close to each other or spread over a large sprawling site.
- Other departments – some hospital departments may be opposed to Outreach Services intervening in the management of patients on the wards. Consultants 'own' the patients and to an extent resources will follow these patients.
- Existing services may already be in place such as clinical nurse specialists involved with non-invasive respiratory support and tracheostomy care, nutrition and acute pain teams.
- Wards – with the development of sub-specialties, ward areas may act as a step-up facility to the general ward area and hence reduce pressure on Critical Care Services in some trusts. Many trusts have developed special areas for postoperative care which are under the responsibility of surgical departments.

Critical Care Aspects

- Facilities – in terms of critical care provision of beds, equipment and personnel.
- Opinion will vary amongst consultants involved in critical care with regard to outreach. Some units may be active in seeking resource allocation and setting up these services. Others may view with some trepidation (perhaps correctly) that there are large numbers of patients being cared for in inappropriate areas and that any additional responsibility for these patients will overwhelm their present facilities.

- Out of hours provision of outreach is the ideal given that acute emergencies and development of critical illness can occur at any time of day and night. Staff recruitment and funding for additional posts may be difficult resulting in a more limited role during 'daylight' hours. In order to facilitate an expansion to provide 24-hour cover, nursing roles may be incorporated into other developments such as the night-nurse practitioner.

5 IDENTIFICATION OF PATIENTS AT RISK

5.1 The National Expert Group[1] has recommended that the existing division of patients depending on location be replaced by an assessment of need for care[F1]:

Level 0
Patient whose needs can be met through normal ward care in an acute hospital.

Level 1
Patients at risk of their condition deteriorating, or those relocated from higher levels of care, whose needs can be met on an acute ward with additional advice and support from the critical care team.

Level 2
Patients requiring more detailed observation or intervention including support for a single failing organ system or postoperative care and those 'stepping down' from higher levels of care.

Level 3
Patients requiring advanced respiratory support alone or basic respiratory support together with support of at least two organ systems. This level includes all complex patients requiring support for multi-organ failure.

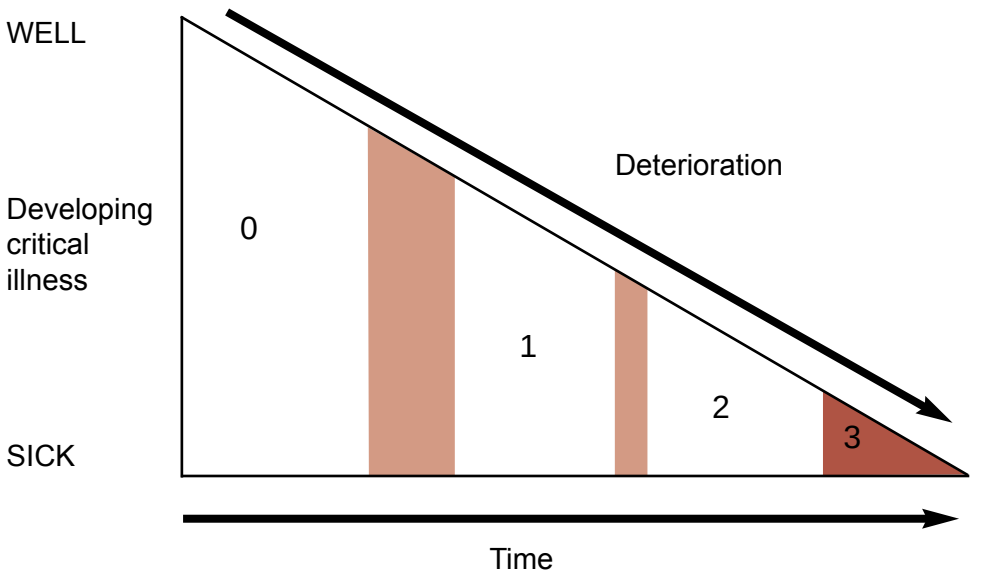
5.2 Critical care resources within the hospital should provide increasing levels of care depending on the skills, staff and facilities available. Patients will move up or down the dependency levels according to their condition and may require inter-hospital transfer for clinical or non-clinical reasons if there is inadequate resource provision or a need for more advanced specialist care.

5.3 The identification of patients at risk is fundamental to outreach. With this approach, the continuum along the levels of care remains (see Fig 1). Identification of patients who require advanced respiratory support should be straightforward although it has been shown that a proportion of these patients have their treatment delayed. As dependency falls there is a greater overlap between the groups which may lead to difficulty in classifying patients particularly between levels 0-1 and 1-2. The vision for the future of Critical Care Services includes the provision of outreach to support care of level 1 patients on the general ward.

5.4 The time course of deterioration will vary from patient to patient; some will not exhibit prodromal physiological derangement. The sudden collapse of a patient from an acute arrhythmia or a massive pulmonary embolism will not allow time for prior identification or intervention by an outreach team. The detection of deterioration in a patient's condition over hours or days, which is amenable to earlier intervention, is the challenge for outreach.

F1 The Intensive Care Society has published a document 'Levels of Critical Care for Adult Patients' that expands these definitions.

Figure 1. Levels of dependency (0, 1, 2, or 3) and the overlap of groups of patients.



5.5 The number of level 1 patients in a trust is unknown and will depend on interpretation of the definition. However there must be a threshold that allows adequate and appropriate identification of level 1 patients whilst at the same time excluding a potential deluge of low dependency patients.

5.6 A patient at risk of deterioration may be identified by:
- exhibition of abnormal physical signs
- their condition or pre-morbid history (e.g. major emergency surgery)
- intuition: 'not quite right'

5.7 Systems based on abnormal clinical or physiological variables:
a) Calling criteria derived for a Medical Emergency Team[9]

Table 5.1: Medical Emergency Team Calling Criteria
All cardiac and respiratory arrests and all conditions listed below

Acute changes in: AIRWAY	**Vital signs**: Threatened
BREATHING	All respiratory arrests Respiratory rate <5 per minute Respiratory rate >36 per minute
CIRCULATION	All cardiac arrests Pulse rate <40 per minute Pulse rate >140 per minute
NEUROLOGY	Sudden fall in level of consciousness (Fall in Glasgow Coma Score of >2 points) Repeated or prolonged seizures
OTHER	Any patient who does not fit the criteria above, but whom you are seriously worried about

b) The Patient at Risk Team (PART) Protocol[10]

A: The senior ward nurse should contact the responsible doctor and inform them of a patient with:

Any 3 or more of the following:

Respiratory rate ≥25 breaths/min (or<10)
Systolic arterial pressure <90 mmHg
Heart rate ≥110 beats/min (or <55)
Not FULLY alert and orientated
Oxygen saturation <90%
Urine output <100 ml over last 4h

OR A patient not FULLY alert and orientated AND
Respiratory rate ≥35 breaths/min OR heart rate ≥140 beats/min

Unless immediate management improves the patient, the doctor should consider calling the team. Exceptionally (in an emergency when a responsible doctor is not immediately available) the senior ward nurse may contact the team directly.

B: A doctor of SpR grade or above may call the team for any seriously ill patient causing concern. This will normally be done after discussion with the patient's consultant. The consultant responsible for the patient must be informed as soon as practical that the team has been called.

c) Critical Care Liaison Service[16]

Heart rate <45 or >125 beats/min
Systolic arterial pressure <90mmHg
Respiratory Rate <8 or > 30 bpm
SaO_2 <90% on 24% oxygen
PaO_2 <9.0 kPa
$PaCO_2$ >6.5 kPa on 24% oxygen
PH <7.25
Glasgow Coma Score <8 or a decrease >2 points

d) The Early Warning Score System[11]

Table 5.2: The Early Warning Score System

	3	2	1	0	1	2	3
HR		<40	41-50	51-100	101-110	111-130	>130
BP	<70	71-80	81-100	101-199		>200	
RR		<8		9-14	15-20	21-29	>30
TEMP		<35.0	35.1-36.5	36.6-37.4	>37.5		
CNS				A	V	P	U

A = alert V = responds to voice P = responds to pain U = unconscious

e) The Modified Early Warning Score System[12]

Table 5.3: The Modified Early Warning Score

	3	2	1	0	1	2	3
HR		<40	40-50	51-100	101-110	111-129	≥130
BP	>45%↓	30%↓	15%↓	Normal*	15%↑	30%↑	>45%↑
RR		≤8		9-14	15-20	21-29	≥30
TEMP		<35.0		35.0-38.4		≥38.5	
CNS				A	V	P	U
Urine	Nil	<1ml/kg/2h	<1ml/kg/h		>3ml/kg/2h		

*= for patient

All the above criteria and scoring systems rely on observations of the physiological status of the patient. The importance of the physiological variable and the appropriate weighting in the scoring system has not, as yet, been validated. However these are simple bedside observations which can be performed by a nurse, doctor or other trained staff. In certain instances blood tests or basic monitoring equipment such as a pulse oximeter are used. The patient developing critical illness on the ward will require focused and regular observations by staff who appreciate and understand the significance of basic physiological parameters and derangement from normal values (including patients who may exhibit chronic or acute on chronic changes). The objective and dynamic measure of a patient's physiology will highlight deterioration to a greater extent than subjective assessments.

5.8 **Specific Conditions**

The list of specific conditions or disease processes that may lead to critical illness is broad. However, each hospital is likely to provide care for a limited number of specialist interests which can largely require the support of a critical care facility. Organisational protocols for treatment of common conditions that are reflective of local practice need to be developed.

5.9 **Patients Causing Concern**

There are a proportion of patients who will mask critical illness by their physiological response and general demeanour. The development of any threshold criteria or simplified scoring systems to detect critical illness on the ward will never be totally inclusive. The ability to detect illness intuitively should never be underestimated. The clinical judgement of all staff will be of importance to the outreach team. Thus the patient who is 'not right', 'off colour' or 'agitated' must be considered at risk[17].

5.10 Some hospitals have introduced a nurse-led Outreach Service that consists of a 'trawl' of the ward reviewing specific groups of patients such as trauma or major post-operative patients and patients 'causing concern' to ward staff although these are not specifically proscribed.

6 THE RESPONSE TO CRITICAL ILLNESS

6.1 The management and treatment of the patient developing critical illness should be initiated by ward based staff. Appropriate skills and resources for the management of patients with level 1 dependency should be available at ward level with an input from

the Outreach Service. With additional assistance, it should be possible to achieve basic resuscitation and safe transfer of higher level dependency patients in a timely fashion to a critical care area.

6.2 The indications for asking for help from the Outreach Service should be determined and agreed locally, but aimed to ensure staff with the relevant competencies are involved in the management of patients at an early stage. This may require fairly simple and basic interventions. The importance of ward staff in the initial treatment of a patient with developing illness should be focused and enhanced by the process of outreach.

6.3 Some patients will not benefit from the additional medical resources of the critical care team, either because their illness is beyond recovery or because co-morbidity would render treatment futile and inappropriate. Other patients, following discussion with staff experienced in intensive care medicine, may express a preference not to be admitted to a critical care area and these decisions require careful documentation. However, all patients have a right to treatment of an appropriate level and this may well involve basic monitoring and therapeutic interventions that will be enhanced at the ward level by outreach provision.

7 MEMBERSHIP OF OUTREACH SERVICES

7.1 Outreach is a multidisciplinary approach to critical illness and this should be reflected in the membership of that service. Inevitably the composition of the Outreach Service will vary depending on local critical care priorities, historical development and perceived needs by ward based staff. The number of staff involved in the Outreach Service will be dependent on the size and geography of the hospital and whether it is planned to provide a team on a 24-hour, 7-day a week basis or only during 'daylight' hours. Aspects of outreach should be 'owned' by ward staff and hopefully skills learnt will then be passed on to the rest of the ward team. The support of senior ward staff at both consultant and nursing management level will be crucial to the successful introduction of outreach. It must be remembered that members of the outreach team will be visitors/guests to the ward and it will only be in a way co-operative and supportive role that outreach will succeed. Any attempt to impose changes no matter how beneficial will be perceived to be a challenge to the 'autonomy' of the ward area and this could lead to confrontation.

7.2 Medical input should comprise consultants in critical care medicine with sessional commitment to the Outreach Service and trainee medical cover for critical care with no other responsibilities other than those directly related such as cardiac arrest, trauma calls or transfer calls.

7.3 Nursing input should consist of critical care nursing staff, with a possible lead role for a nurse consultant or clinical nurse specialist, supported by other appropriately trained nurses.

7.4 Physiotherapy support will add skills in the assessment and treatment of patients, and also help sustain the rehabilitation programme during recovery from critical illness. The physiotherapy team will be more aware of the respiratory status of patients and will often highlight deterioration at an earlier stage.

7.5 Other allied health professions will also have an important role in a hospital-wide delivery of services. These include dietetic, rehabilitation and pharmacy staff to provide advice and support. Critical care technicians should help with stabilisation of patients and have responsibility for standardisation of equipment throughout the hospital. The resuscitation officer should be involved in developing an integrated training programme.

7.6 Support staff will be required to enable robust audit. The ability to audit service provision and clinical governance issues that may be highlighted by the introduction of outreach will require data collection for validation.

8 EDUCATION

8.1 One of the three stated aims of outreach in the 'Comprehensive Critical Care' document is the sharing of skills with ward based staff. This aspect of outreach is of equal importance to the process of identification of the critically ill patient.

8.2 With the lack of specific training programmes and the concentration of historical service development on critical care units, it is not surprising that there has been a decline of critical care skills outside these areas. However these deficiencies extend beyond the boundaries of the hospital service and changes in emphasis of graduate teaching must be recognised. Doctors are inexperienced at dealing with acute medical emergencies and many would not have previously seen the conditions.

8.3 The process of outreach should be seen as one of developing skills not one of de-skilling.

8.4 A key recommendation from 'Comprehensive Critical Care' is the establishment of High Dependency Skills courses for ward staff with a target of 50% of staff to be trained by 2002 and 100% by 2004[1].

8.5 Education should be directed at the following levels:

Ward

Involving all ward staff both nursing and medical. This should include details of outreach and its purpose and will involve induction sessions on starting an appointment, as well as instruction on how the aims of outreach are achieved at the local level. Rotation of ward staff through critical care areas such as high dependency units should be encouraged to enable and consolidate re-skilling. Many hospitals have introduced rotational junior medical and surgical posts to critical care medicine and these should be widened. Multidisciplinary ward rounds should be encouraged focusing attention on level 1 patients on the ward area with outreach playing an active role alongside ward-based staff. The importance of audit of services and joint morbidity and mortality meetings, not only between medical staff but also inclusive of nursing and allied health professions staff, are essential so that lessons from delayed or suboptimal treatment can be shared, inadequacies highlighted and repetitive mistakes prevented. It will only be by developing a learning or safety culture that this will be achieved. Courses such as ALS (Advanced Life Support), CCrISP (Care of the Critically Ill Surgical Patient) and ALERT (Acute Life-threatening Events Recognition and Treatment) should be actively promoted at the local level by Trusts for staff development and also by the responsible Royal Colleges.

Outreach Service

Outreach is a new and evolving concept. It is imperative that there are nationally agreed standards and minimum levels of competence, both within existing and recently developed teams. These may take the form of advanced assessment skills. All of these should, however, draw on the existing skills of allied health professions such as physiotherapy, acute pain teams and dietetics. Future appointments should have an educational plan for the development of all Outreach Service members.

9 INITIATION OF SERVICE

9.1 An Outreach Service cannot and should not be set up without a contribution from ward-based staff. Agreement will have to be reached on operational running of the service. It is essential that referral guidelines are drawn up and agreed by all parties. The support of senior ward staff, and in particular the consultant body, is of great importance in the acceptance of these operational aspects. A considerable effort is required concentrating on why the service is being introduced. The aims of outreach should be presented to encourage ward staff to become involved in running aspects of the service. Standardisation of charts or incorporation of outreach objectives with existing documentation such as pain charts may be required. Outreach will need to be 'sold' to ward staff who are already short-staffed, inundated with forms to complete and who may feel threatened, under-valued or resentful that funding has been provided in such a manner. Experience has shown the benefit of selling the idea to nursing staff and stressing the advantage in the ability to focus attention on the right groups of patients at the right time with a mechanism to get an appropriate level of help. Initiation of the service in a defined area may be prudent as problems can be quickly identified and the number of staff that require training is limited. Loss of confidence in the system will happen readily if it is not continually monitored and any problems that arise are not addressed promptly. It will make a difficult task impossible if confidence is lost and disagreement ensues.

10 AUDIT AND RESEARCH

10.1 Additional monies from the government have funded outreach. It is essential that the introduction of services are fully audited both to justify the investment and to highlight areas of suboptimal care in the hospital. It will only be by robust and thorough data collection that future resources can be focused and the continued role of outreach justified. Of particular importance will be measuring the level of dependency of patients within an organisation in relation to critical care provision. This will require additional staff to assist with data input that should not form part of the role of the Outreach Services.

10.2 There should be a common minimum data set collected to assess the effect of introduction of outreach and allow comparison of service provision (see Appendix 1).

10.3 Consideration should be given to a national enquiry into care of the critically ill so that common causes of suboptimal care can be identified and systems introduced to highlight best practice.

11 CONCLUSIONS

11.1 These current guidelines are the first issued by the Intensive Care Society on the subject of Outreach Services and should be viewed as a guide. As Outreach Services evolve further, information and experience will be gained, and this will be reflected in future publications.

11.2 The development of Outreach Services cannot be taken in isolation from other critical care initiatives and should be part of an integrated, multidisciplinary hospital-wide delivery of Critical Care Services.

11.3 Ideally the success of an Outreach Service may be measured in an evolving role over time.

11.4 Emphasis should be placed on education and identification of patients developing critical illness.

12 REFERENCES

1 Department of Health. Comprehensive Critical Care: a review of adult critical care services. London: DoH 2000. http://www.doh.gov.uk/pdfs/criticalcare.pdf

2 Department of Health. A Health Service of all the talents: Developing the NHS workforce. London: DoH 2000. http://www.doh.gov.uk/wfprconsult

3 Department of Health. An organisation with a memory. London: DoH 2000. http://www.doh.gov.uk/orgmemreport/

4 Schein RM, Hazday N, Pena M, Ruben BH, Sprung CL. Clinical antecedents to in-hospital cardiopulmonary arrest. *Chest* 1990; **98**:1388-92.

5 Franklin C, Mathew J. Developing strategies to prevent inhospital cardiac arrest: analyzing responses of physicians and nurses in the hours before the event. *Crit Care Med* 1994; **22**: 244-47.

6 Buist MD, Jarmolowski E, Burton PR, Bernard SA, Waxman BP, Anderson J. Recognising clinical instability in hospital patients before cardiac arrest or unplanned admission to intensive care. *Med J Australia* 1999; **171**: 22-25.

7 Goldhill DR, White SA, Sumner A. Physiological values and procedures in the 24 h before ICU admission from the ward. *Anaesthesia* 1999; **54**: 529-34.

8 McQuillan P, Pilkington S, Allan A et al. Confidential inquiry into quality of care before admission to intensive care. *BMJ* 1998; **316**:1853-58.

9 Lee A, Bishop G, Hillman KM, Daffurn K. The Medical Emergency Team. *Anaesth Intensive Care* 1995; **23**: 183-86.

10 Goldhill DR, Worthington L, Mulcahy A, Tarling M, Sumner A. The patient-at risk team: identifying and managing seriously ill ward patients. *Anaesthesia* 1999; **54**: 853-60.

11 Morgan RJM, Williams F, Wright MM. An early warning scoring system for detecting developing critical illness. *Clin Intensive Care* 1997; **8** (2):100.

12 Stenhouse C, Coates S, Tivey M, Allsop P, Parker T. Prospective evaluation of a modified Early Warning Score to aid earlier detection of patients developing critical illness on a surgical ward. *Br J Anaesth* 2000; **84**: 663P.

13 Harrison GA, Hillman KM, Fulde GWO, Jacques TC. The need for undergraduate education in critical care. *Anaesth Intensive Care* 1999; **27**: 53-58.

14 Daffurn K, Lee A, Hillman KM, Bishop GF, Bauman A. Do nurses know when to summon emergency assistance. *Intensive Crit Care Nurs* 1994; **10**: 115-20.

15 The Audit Commission. Critical to Success. London,1999. htpp://www.audit-commission.gov.uk/publications/brccare.shtml

16 Hickey C, Allen MJ. A critical care liaison service. *Br J Anaesth* 1998; **81**: 650P.

17 Cioffi J. Recognition of patients who require emergency assistance: a descriptive study. *Heart Lung* 2000; **29**: 262-68.

Appendix 1

COMMON DATASET DEFINITIONS

Great emphasis is now placed on the collection of clinical data and with this has come an expansion in the quantity of information that is being collected. Some of the datasets, such as the Intensive Care National Audit and Research Centre (ICNARC), are well defined and carefully validated, while others (e.g. nurse dependency) exist in many variations. As a result, there is a substantial duplication of data entry while both comparisons between, and searches amongst, the datasets remains difficult.

The purpose of common dataset definitions is to permit the collection of information relevant to the many differing aspects of patient care in a way which:

- prevents duplication of data entry
- allows cross queries between datasets
- minimises the collection of information irrelevant to a particular set of circumstances.

Outreach represents a new concept in the care of patients who are, or who have the potential to become, critically ill. The way in which it has been implemented varies widely and the evidence to support the most effective approach is lacking. In such a climate, there must be flexibility both in the type and mechanisms of data collection, while still maintaining the greatest consistency in what is collected.

The Critical Care Information Advisory Group (CCIAG) is coordinating information collection within critical care on behalf of the Department of Health. This group is defining a dataset along the lines of an ACP (Augmented Care Period) for the ward setting which will be published during 2002.

Many aspects of outreach are concerned with qualitative as well as quantitative service provision such as creating educational packages for ward based staff. These are important areas that should be included in local audit of service provision, but are not addressed in this document.

The fundamental information which might be collected about each patient should include:

- Demographics – age/sex/race etc.
- Admission details – dates/specialty/pathology/outcome etc.
- Care episodes – extending the ACP notion of episodes
- Outreach contacts – nature and result of outreach intervention

The following is an example of a dataset (definitions will be published on the ICS website www.ics.ac.uk) that could be used for the collection of outreach data:

An Example Dataset Template

Surname	See field 'surnm'								
First name	See field 'fstnm'								
Unit No:	See field 'hospid'						Ethnic grp		
DOB	d d m m y y y y	Age:	years	Sex:	M	F	Weight:	kg kg kg	
DAH	d d m m y y y y	Consultant	See field 'cpcons'						
SOURCE:	See field 'SOURCE'	LPSOURCE:	See field 'LPSOURCE'				Planned	y/n	
Primary reason for adm:	See field 'ra1txt'								
Secondary reason for adm:	See field 'ra2txt'								
Surgery:	Y		N		Date & Time of Surgery:	d d m m y y y y		h h m m	
Operation:									
Mode of Surgery	Elective:		Scheduled:		Urgent:		Emergency		

Date of referral Outreach	d d m m y y y y	Time of referral Outreach	h h m m
Date of assess Outreach	d d m m y y y y	Time of assess Outreach	h h m m
Date previous contact	d d m m y y y y	Time previous contact	h h m m

Reason for assessment:	See field 'rvrsn' for definitions
Source of referral:	See field 'refby' for definitions
Seen by:	See field 'seenby' for definitions
Action taken:	See field 'action' for definitions
Patient referred by outreach team	If 'action' = 'R', see field 'referral' for definitions
Patient transferred:	If 'action' = 'T', see field 'transfer' for definitions
Level of care required:	See field 'level' for definitions
Level of care received:	See field 'levelrec' for definitions
Reason for level of care:	See field 'reasonlev' for definitions
Suggested follow up by outreach:	If 'action' = 'F', see field 'futiming' for definitions

Physiological Data **AT** time of assessment by outreach team:							
HR	hr	SBP	sbp	DBP	dbp	RR	rr
UO/hr	uop	AVPU	avpu	GCS	gcs	Temp	temp
FiO_2	FiO_2	SaO_2	SaO_2				

Physiological Data **PRIOR** to assessment by outreach team:											
HR	high	low	SBP	high	low	DBP	high	low	RR	high	low
U/O	high	low	AVPU	worst		GCS	worst		Temp	high	low
FiO_2	high	low	SaO_2	high	low						

Biochemistry & haematology prior to or at assessment by outreach team:									
Na		K		Urea		Creat		Hb	
WCC		Plt		INR		APTT		APTT ratio	
pH		PaO_2		$PaCO_2$		HCO_3		BE	

Research Tag	
Comment	

Outcome:	HDIS	A		D		DDH or DOD	d d m m y y y y

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