6. Referral process

Key findings

- **A high percentage of patients were referred to critical care by staff in training; 21% of referrals were made by SHOs.**
- **Consultant physicians had no knowledge or input into 57% of referrals to critical care.**
- **Delays between referral to critical care and review (5%) and between decision to admit to critical care and admission (16%) were common.**
- **A significant factor in delay was the lack of appropriate staff and ICU beds.**
- **18% of patients were admitted to ICU without prior review by the intensive care service.**

Introduction

To ensure optimum management of acutely ill patients it is important that the process of referral from the ward for critical care is well managed. This should allow timely referral of patients likely to benefit from critical care admission and should also minimise referral of patients for whom intensive care is thought to be inappropriate. These are difficult decisions and consultant involvement in the referral process is essential.

The referrer

Table 1 shows the health professional who referred the patient to the critical care service. Where it was possible to discern from the casenotes, 64% of patients were referred by SHOs or SpRs and consultant referral only took place in 23% of cases.

Table 1. Grade of referrer to ICU

Health professional who referred patient	Total	*(%)*
Consultant physician	256	*(23)*
Registered nurse	10	*(1)*
SHO	238	*(21)*
SpR year 1 or 2	255	*(23)*
SpR year 3+	229	*(20)*
Staff Grade / Associate Specialist	68	*(6)*
Other	74	*(7)*
Sub-total	**1,130**	
Not answered	105	
Total	**1,235**	

The direct referral of critically ill patients by staff in training may be appropriate and desirable in some settings, e.g. a young patient with severe acute asthma. However, in other settings more consultant physician involvement in assessment of the patient and the process of referral is probably required. This is particularly important in complex medical patients with multiple comorbidities, in whom decisions about the most appropriate treatment plan are difficult. This may take the form of a bedside review by the consultant or a telephone conversation between resident junior medical staff and the consultant who knows the patient. Table 2 shows that in the patients not referred to critical care by consultants, consultants were informed prior to referral in 43% of cases. This means that 422 patients were referred to critical care by junior doctors, without prior knowledge of a consultant physician.

Table 2. Patient referral to ICU by junior doctors

Physician notified	**Total**	***(%)***
Yes	320	*(43)*
No	422	*(57)*
Sub-total	**742**	
Unknown	181	
Not answered	56	
Total	**979**	

Case study

A patient in their early seventies with a history of severe chronic obstructive pulmonary disease was admitted as an emergency complaining of increasing breathlessness. The patient used oxygen at home and was unable to walk more than five metres on the flat due to dyspnoea and had a history of ischaemic heart disease and severe peripheral vascular disease. On admission the patient was drowsy, tachypnoeic and unable to speak. On high flow oxygen, arterial blood gas analysis showed pH 7.05, $PaCO_2$ 13.1 kPa, PaO_2 6.0 kPa. Initial therapy, instituted by the medical SHO, included steroids, bronchodilators, 24% oxygen and intravenous fluids. After the institution of controlled oxygen therapy the arterial oxygen saturation fell to 68%. As the patient remained drowsy and in respiratory distress the medical SHO referred the patient to the ICU. The ICU SHO admitted the patient and instituted non-invasive ventilatory support for this presumed acute exacerbation of chronic obstructive pulmonary disease. The patient had a cardiac arrest two hours later. Resuscitation was attempted but proved unsuccessful.

This case illustrates the difficulties of providing care without senior doctor input. Whilst the patient was very unwell (and may have met criteria for ICU admission because of acute physiological disturbance), they had significant comorbidities that made decision-making more difficult.
A consultant physician ought to have been involved in the decision to refer this patient or not, on the basis that the outlook was extremely poor. Similarly, an intensive care consultant should have participated in the decision to admit this patient and subject them to the process of intensive care.
In addition, the use of low concentrations of oxygen in an already hypoxic patient and the use of non-invasive ventilation in a patient with this degree of respiratory failure appear inappropriate.

The review

As discussed earlier, one possible measure to improve care of acutely unwell patients is the involvement of an outreach service. In this study 56% (116/208) of hospitals had an outreach service. However, only 23% of patients referred to critical care were reviewed by an outreach service (Table 3). The reasons for this apparent discrepancy are not clear but it may reflect the fact that outreach services have developed in an unstructured manner with no clear strategy. Indeed, few outreach services are available 24 hours per day, 7 days per week and often focus on patients from defined specialties, mainly surgical. It is therefore premature to rely on outreach services to meet the needs of acutely unwell inpatients, although the Royal College of Physicians and its members have suggested this approach [7,30].

Table 4 shows that 82% of patients were reviewed by the intensive care service prior to admission. This is a surprisingly low figure and whilst there may be good reasons to expedite ICU admission for severely ill patients, this should rarely be at the expense of a direct patient review. Table 5 shows that this review rate was not influenced by time of day.

Table 3. Patients reviewed by outreach services

Outreach review	Total	*(%)*
Yes	237	*(23)*
No	780	*(77)*
Sub-total	**1,017**	
Unknown	130	
Not answered	88	
Total	**1,235**	

Table 4. Patients reviewed by ICU staff prior to admission

Intensive care review	Total	*(%)*
Yes	858	*(82)*
No	191	*(18)*
Sub-total	**1,049**	
Unknown	126	
Not answered	60	
Total	**1,235**	

Table 5. Time of ICU review prior to referral to ICU										
Did patient have intensive care review?	**Number of patients by time slot**									
	Day	***(%)***	**Evening**	***(%)***	**Night**	***(%)***	**Unknown**	***(%)***	**Total**	***(%)***
Yes	284	*(85)*	306	*(81)*	182	*(82)*	86	*(74)*	858	*(82)*
No	49	*(15)*	71	*(19)*	40	*(18)*	31	*(26)*	191	*(18)*
Sub-total	**333**		**377**		**222**		**117**		**1,049**	
Unknown	36		36		21		33		126	
Not answered	13		9		5		33		60	
Total	**382**		**422**		**248**		**183**		**1,235**	

Delays

Delays, both in time to ICU review and time to ICU admission, were examined. Table 6 shows that delays between referral and review were reported by the referring physician in 5% of the cases.

Table 6. Delays between referral to ICU and ICU review		
Delay between referral and review?	**Total**	***(%)***
Yes	45	*(5)*
No	895	*(95)*
Sub-total	**940**	
Unknown	146	
Not answered	149	
Total	**1,235**	

The cause of delay was not specified in 20/45 cases and was attributed to lack of resources in 14/45 cases (primarily ICU beds and staff). The remainder were due to clinical reasons. Table 7 demonstrates that the time of day has little impact on the delay to ICU review.

Table 7. Delays in review by time of day										
Review delay?	**Review time slot**									
	Day	**(%)**	**Evening**	**(%)**	**Night**	**(%)**	**Unknown**	**(%)**	**Total**	**(%)**
Yes	12	*(5)*	19	*(6)*	10	*(5)*	4	*(5)*	45	*(5)*
No	299	*(96)*	325	*(95)*	189	*(95)*	82	*(95)*	895	*(95)*
Sub-total	**311**		**344**		**199**		**86**		**940**	
Unknown	34		41		24		47		146	
Not answered	37		37		25		50		149	
Total	**382**		**422**		**248**		**183**		**1,235**	

Table 8a shows the delay between decision to admit a patient to ICU and the actual admission.
As can be seen there is a problem with delayed admission in 16% of cases. Many of these cases were due to the need for stabilisation or investigation but worryingly 36% (59/162) were due to a lack of a critical care bed. The referring physician was asked to assess whether or not any delay had an adverse effect on patient outcome (Table 8b). This was thought to be likely in only one case. Critically ill patients have little physiological reserve and need prompt and appropriate therapy if they are to stand the best chance of recovery. The lack of perceived impact of delayed critical care review and admission is therefore surprising and may reflect poor expectations of a critical care service that has for years been underprovided.

Table 8a. Delays between decision to admit patient to ICU and actual admission		
Delay between ICU acceptance and admission?	**Total**	***(%)***
Yes	162	*(16)*
No	872	*(84)*
Sub-total	**1,034**	
Not answered	58	
Unknown	143	
Total	**1,235**	

Table 8b. Referring physician's assessment of whether delay affected outcome		
If delay, was outcome affected?	**Total**	***(%)***
Yes	1	*(1)*
No	139	*(99)*
Sub-total	**140**	
Unknown	15	
Not answered	7	
Total	**162**	

The advisor groups were asked to consider appropriateness and timeliness of critical care referral. Tables 9a and 9b show this data. It can be seen that in 92% (387/421) of cases, referrals were considered appropriate. The remainder were considered inappropriate due to poor predicted outcome. In addition, it was found that 22% (81/370) of referrals were not made in an appropriate timescale.
These were almost entirely considered to be patients who would have potentially benefited from early referral to critical care.

Table 9a. Appropriateness of critical care referral		
Referral appropriate	**Total**	***(%)***
Yes	387	*(92)*
No	34	*(8)*
Sub-total	**421**	
Insufficient data	18	
Total	**439**	

Table 9b. Timeliness of referral		
Referral at correct time	**Total**	***(%)***
Yes	289	*(78)*
No	81	*(22)*
Sub-total	**370**	
Insufficient data	69	
Total	**439**	

Recommendations

- **Consultant physicians should be more involved in the referral of patients under their care to ICU. The referral of an acutely unwell medical patient to ICU without involvement or knowledge of a consultant physician should rarely happen.**
- **It is inappropriate for referral and acceptance to ICU to happen at junior doctor (SHO) level.**
- **Any delay in admission to critical care should be recorded as a critical incident through the appropriate hospital incident monitoring and clinical governance system.**
- **All inpatient referrals to ICU should be assessed prior to ICU admission. Only in exceptional circumstances should a patient be accepted for ICU care without prior review.**