Managing capacity and workload in children's services

A system to escalate and monitor clinical capacity (STEAM) is helping staff in a neonatal unit to communicate and manage capacity as Matt Wyatt and Karen Healey explain

There's a fitting baby up on neonates, a flat one-year-old down in A&E, 30-weeker twins about to drop in maternity, disruptive parents in the assessment unit and a set of welli-boot level blood results on the children's ward – so what do you do first?

That was a real scenario facing staff at the Princess of Wales Hospital, Bridgend part of Bro Morgannwg NHS Trust in South Wales. A review of this complex situation revealed how difficult it can be to prioritise and communicate effectively with the whole team. With the magic of hindsight and a cup of coffee, it's easy to prioritise the care and direct the resources to get the best outcomes. But how do you do that sort of objective assessment of the care in five different places, under pressure and in real time, without a crystal ball?

Fig 1 STEAM assessment proforma

Staff identified the need for some kind of clinical assessment system to escalate and monitor activity, to try and predict problems, put contingencies in place and most importantly 'keep it safe'. This brief led to the development of the Bro Morgannwg *System To Escalate And Monitor: STEAM* described in this article.

Capacity assessment

Head counting or simply calculating occupancy rates has traditionally been the approved measurement of activity but such measures do not reflect the intensity of care being provided. There is a common misconception that capacity is about size or space (the number of beds) but in the clinical sense it is the ability to perform work. Capacity is a complex calculation with a number of variables including: intensity, urgency, expertise, probability as well as the extent of the facility.

STEAM is a paper-based tool that enables staff to record the level of intensity of care being provided to each patient within a department and use that measurement as the basis for a risk assessment of the clinical capacity of the department at the time of the assessment. The principal assessment proforma has a risk assessment matrix on the front and a series of tables for individual patient assessment, designed as a map of the department, so that every bed, bay and patient can be identified. These individual patient assessments form the basis of an overall assessment

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KEY WORDS

Children: services
Intensive care: neonatal
Risk management
Staffing levels

Each department's maximum score is fixed, agreed by the clinical director and calculated by designating every bed within the department a score from one to five

of the department's clinical status, which is then communicated using a traffic light methodology (see below).

An additional supplementary assessment proforma (Figure 1) with just the risk assessment matrix was also developed to enable a quick re-assessment of the clinical status when this is needed.

Using the STEAM tool

When to assess

Because of the nature of clinical activity there are endless possible scenarios that can influence the safe and effective provision of care. Guidance for staff on the use of STEAM suggests when they should consider undertaking an assessment rather than dictating appropriate intervals. The procedure is intended to uphold the principle of risk assessment – safety is best assessed using the joint experience of the senior clinical team available at the time. The tool provides a formal record of that assessment and subsequent decisions. A decision not to change, or to reduce status is equally relevant and should be recorded in the same detail as an assessment to escalate the status.

The principal assessment may be undertaken at any time, and as often as is considered necessary, but must be completed at least once a day, preferably at a scheduled handover. The clinical status is then communicated using a traffic light methodology to make it easily understandable. The clinical status (traffic light colour) is also displayed on large coloured cards at a prominent point within the department, so all staff entering the department are immediately aware of the status.

The supplementary assessment sheet can be used to re-assess the clinical status without rewriting the principal proforma, and the individual patient assessments can be simply and neatly updated. Both documents are medical records and must be filed and maintained in date order according to health records policy.

Box 1: Traffic light definitions

Green	Staffing is consistent with normal rota, STEAM is below 60 per cent No unusual contingencies are required to maintain normal and safe services
Amber	Normal skill mix is compromised, STEAM is above 60 per cent Some contingencies have been put in place but the department continues to function safely
Red	Normal skill mix is seriously compromised, STEAM is above 80 per cent All contingencies have been put into place and the department may need to be closed to admissions
Black	This level is very rarely used and denotes a major event instigated by the executive All organisational resources are made available and several departments function within a state of emergency

Individual patient assessments

Using the simple map of the department, every patient is identified and scored to provide a record of the clinical intensity of care being provided to each patient at the time of the assessment. The clinical score is based on levels of care from one (low) to five (high), referenced to each department's procedure for classification of casemix, which contains a more detailed definition for each specialty. The clinical scoring system that must be adhered to is as follows:

1 cases of minimal clinical care: unscheduled observations; personal care, education or support usually only provided upon request. For example a patient who is self-caring or awaiting routine discharge
2 cases of minor clinical care: scheduled observations; routine medication; with some personal care and support. For example recuperative or respite care (maximum status of outlier)
3 cases of routine (including specialist) clinical care: regular observations; prescribed medication; personal care, education and support. For example non-invasive treatments
4 cases considered to be high dependency, requiring specialist clinical care: frequent observations; advanced medication; respiratory support; with close physical and personal care. For example 12-hour post operative

5 cases considered to be intensive care: requiring a minimum of 1:1 clinical care, continuous observations; complex medication; artificial system support; complete physical and personal care. For example ventilated neonate, specialled cases.

This clinical scoring system provides two statistical measurements that form the basis of the overall assessment:

STEAM The overall clinical intensity, calculated as the sum of individual scores as a percentage of the maximum score

TAPS The Average Patient Score, calculated as the sum of individual scores divided by the number of patients.

Each department's maximum score is fixed, agreed by the clinical director and calculated by designating every bed within the department a score from one to five as above, for the maximum intensity that can be supported by the department's established staffing skill mix.

Clinical status and traffic light definitions

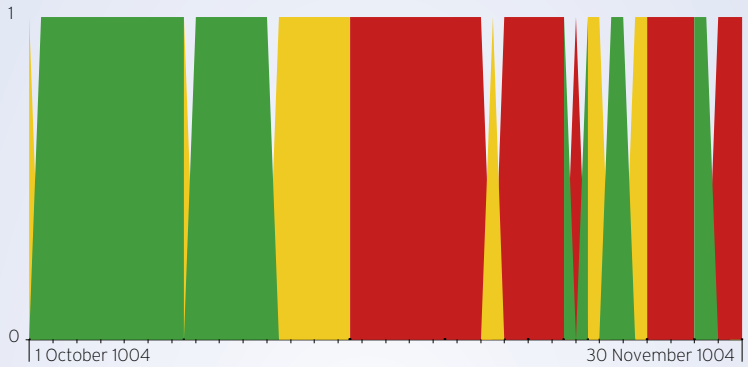
After completing the individual patient assessments, the overall matrix is annotated and the clinical status confirmed and communicated. The traffic light definitions (see box 1) are not exhaustive or fixed, but a guide under which the combination of factors at the time of the assessment should be considered. The decision to change status must be made on the basis of the combination of skill mix, individual patient requirements and available contingencies and not solely on the rate of STEAM.

Before changing status from Green to Amber, the following actions need to be considered/instigated:

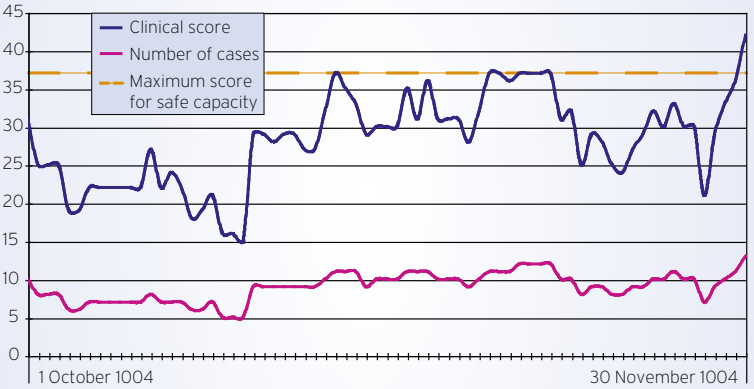
- complete the individual patient assessment for all cases
- review medical and nursing staffing rota/skill mix and reschedule staff appropriately where possible
- identify potential admissions and implications of activity across allied departments
- assess levels of operational and clinical equipment to ensure availability against increased activity
- delay or postpone non essential planned activities, meetings and appointments
- contact nursing bank (or agency) to enquire about availability of staff.

Fig 2 Status of the neonatal department for October and November 2004

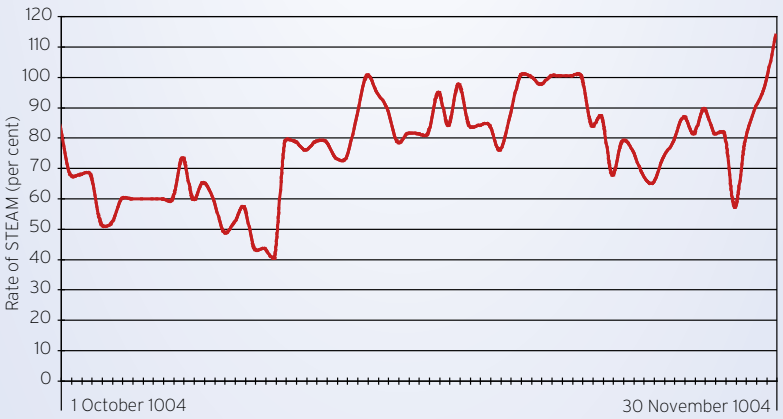
2a Traffic light status



2b Patient activity



2c Operational capacity



Before changing status up to Red, the following actions need to be considered/instigated:

- all of the above reviewed and reconsidered
- assess status of allied departments and where appropriate those of adjacent organisations within the clinical network
- contact the on-call senior nurse and consultant for advice or attendance
- secure additional bank, agency or locum staff.

The decision to close a department to admissions can only be made by the senior consultant or head of nursing. In the event of a closure, the department's closure protocol is instigated and communicated to all stakeholders. The rate of STEAM and the clinical status do not automatically constitute or discount the closure of a department: safety comes first.

> Staff feel more in control and better supported as situations escalate; they feel more confident in contacting senior staff with the evidence of the assessment

Implementing the STEAM system

Following awareness sessions for staff, STEAM was introduced on to the neonatal unit as a pilot for six weeks and was so well received that staff have continued to use the tool as normal practice. Figure 2a, traffic light status, demonstrates the status of the department for October and November 2004, which anecdotally was a reasonably normal period of activity. STEAM assessments were undertaken at least once a day and up to three times on some days.

Figure 2b, patient activity, shows the number of cases and total clinical score at the time of each assessment. The neonatal unit is structured to deal with two intensive, three high dependency and five special care cots and therefore the maximum clinical score in the department should not exceed 37. Clearly the intensity of care being provided fluctuates hour-by-hour and day-by-day; Figure 2c, patient activity, demonstrates the rate of STEAM, calculated as the total clinical score as a percentage of the maximum clinical score.

As can be seen in the patient activity graph, the department functioned at 100 per cent of the safe capacity on a number of occasions, and on average is functioning well above the 70 per cent recommended by the British Association of Perinatal Medicine (BAPM 2001).

Benefits and progress

The Directorate is currently looking to implement STEAM into four other inpatient departments and develop protocols for how the different assessments will interrelate and provide a picture of the total provision of care. We may also have created a bed management tool by mistake. Considerable benefits have been identified in direct feedback from staff who feel more in control and better supported as situations escalate; they feel more confident in contacting senior staff with the evidence of the assessment. But the real winner is that STEAM does not create any extra work. The principal assessment tool has been used to formalise handover as the information collected for the individual patient assessments on the department map is exactly what is needed to facilitate a multidisciplinary handover. Rather than inventing yet another procedure for recording what has happened after the fact, STEAM has become an essential part of the process of delivering care.

The importance of the STEAM assessment as a communication tool is highlighted in this quote from a manager: 'As a person with no clinical background, I can pick up an assessment from months ago and understand exactly what pressures were facing staff in the neonatal unit.' The tool enables the head of nursing services to understand the cot pressures as well as dependencies and activity, in real time. It supports engagement with senior colleagues and commissioners by objectively demonstrating the reality of managing the service and resource issues. To truly work in partnership as a management team we need a common language and, as far as we can tell, STEAM is more powerful than any business case PN

REFERENCES

British Association of Perinatal Medicine (2001) *Standards for Hospitals Providing Neonatal Intensive and High Dependency Care* (Second Edition) www.bapm.org/documents/publications/hosp_standards.pdf

Principal Assessment

When		Date	Time
Who		Signature	Designation

Reason For Assessment **Including whether the event has generated a clinical incident form**	
Medical Staffing Status **Including level of cover on and off site and any shortfall in the rota**	
Nursing Staffing Status **Including level of cover on and off site and any shortfall in the rota**	
Network Status **Transfers expected or planned internally and externally**	
Senior Staff **Advice from on-call consultant or other relevant senior staff**	

STEAM	%	Clinical Status	Green	Amber	Red	Black
TAPS		Admission Status	Open	Open Internal	Limited Internal	Closed

Communication Protocol **Note which allied departments and staff have been advised of status**	

Score	Patient's Name		Time & Date of Admission	Presenting Condition	Management Plan/Notes	Potential or Actual Discharge Time/Date
	Gestation	Birth Weight				
Mode of Ventilation	Corrected Age	Last Weight				
	Age (days)	Present Weight				
	Male/Female	Consultant				

Individual Patient Assessment - ITU Bay

Individual Patient Assessment - Double Cubicle

Score	Patient's Name		Time & Date of Admission	Presenting Condition	Management Plan/Notes	Potential or Actual Discharge Time/Date
	Gestation	Birth Weight				
Mode of Ventilation	Corrected Age	Last Weight				
	Age (days)	Present Weight				
	Male/Female	Consultant				

Individual Patient Assessment - HDU Bay

Individual Patient Assessment - Single Cubicle

Score	Patient's Name		Time & Date of Admission	Presenting Condition	Management Plan/Notes	Potential or Actual Discharge Time/Date
	Gestation	Birth Weight				
Mode of Ventilation	Corrected Age	Last Weight				
	Age (days)	Present Weight				
	Male/Female	Consultant				

Individual Patient Assessment - Nursery

Score	Patient's Name		Time & Date of Admission	Presenting Condition	Management Plan/Notes	Potential or Actual Discharge Time/Date
	Gestation	Birth Weight				
Mode of Ventilation	Corrected Age	Last Weight				
	Age (days)	Present Weight				
	Male/Female	Consultant				

Individual Patient Assessment – Outreach/Transitional Care

Notes Page

Principal Assessment

When		Date	Time
Who		Signature	Designation

Reason For Assessment **Including whether the event has generated a clinical incident form**	
Medical Staffing Status **Including level of cover on and off site and any shortfall in the rota**	
Nursing Staffing Status **Including level of cover on and off site and any shortfall in the rota**	
Network Status **Transfers expected or planned internally and externally**	
Senior Staff **Advice from on-call consultant or other relevant senior staff**	

STEAM	%	Clinical Status	Green	Amber	Red	Black
TAPS		Admission Status	Open	Open Internal	Limited Internal	Closed

Communication Protocol **Note which allied departments and staff have been advised of status**	

STEAM Guidance Notes

Due to the nature of clinical activity there are endless possible scenarios that can influence the safe and effective provision of care. Therefore, these notes are meant to be no more than guidance for staff to suggest when they should consider undertaking an assessment. This procedure is intended to uphold the principle of risk assessment in that at any point in time, safety is best assessed using the joint experience of the senior clinical team available at the time and as such; this is the formal record of that assessment and subsequent decisions. A decision not to change, or to reduce status is equally relevant and should be recorded in the same detail as an assessment to escalate the status. A principal assessment may be undertaken at any time and as often as it is considered necessary, but must be completed at least once a day preferably at a scheduled handover. The clinical status is then communicated using a Traffic Light methodology to make it easily understandable. The clinical status (traffic light colour) is also displayed on large coloured cards at a prominent point within the department, so all staff entering the department are immediately aware of the status.

This supplementary assessment sheet can be used to re-assess the clinical status without rewriting the principal proforma when the individual patient assessments can be simply and neatly updated however, this must be attached and filed together with the principal proforma. Both documents are medical records and must be filed and maintained in date order according to Health Records Policy.

Individual Patient Assessment

The framework inside the principal assessment is designed as a simple map of the department. Every patient must be identified and scored to provide a record of the clinical intensity of care being provided to each patient at the time of the assessment. The clinical score is based on this level of care from 1 (low) to 5 (high) and should be referenced to the departmental procedure for classification of casemix, which will contain a more detailed definition for each specialty. However, the clinical scoring system must be adhered to:

1 Denotes cases of minimal clinical care; unscheduled observations; with any personal care, education or support usually only provided upon request eg self-caring patient or awaiting routine discharge.
2 Denotes cases of minor clinical care; scheduled observations; routine medication; with some personal care and support eg recuperative or respite care (maximum status of outlier).
3 Denotes cases of routine (including specialist) clinical care; regular observations; prescribed medication; with personal care, education and support eg non-invasive treatments.
4 Denotes cases considered to be high dependency, requiring specialist clinical care, frequent observations; advanced medication; respiratory support; with close physical and personal care eg 12 hour post operative.
5 Denotes cases considered to be intensive care, requiring a minimum of 1:1 clinical care, continuous observations; complex medication; artificial system support; complete physical and personal care eg ventilated neonate, specialled cases.

This clinical scoring system provides two statistical measurements that form the basis of the overall assessment:

- **STEAM =** the overall clinical intensity, calculated as the sum of individual scores as a percentage of the maximum score
- **TAPS** = The Average Patient Score, calculated as the sum of individual scores divided by the number of patients

The department's maximum score is fixed, agreed by the Clinical Director and calculated by designating every bed within the department a score from 1 to 5 as above, for the maximum intensity that can be supported by the department's staffing skill mix.

Clinical Status & Traffic Light Definitions

After completing the individual patient assessments, the overall matrix on the front page must be annotated in the relevant sections and the clinical status confirmed and communicated. The traffic light definitions are not exhaustive or fixed, but a guide under which the combination of factors at the time of the assessment should be considered. The decision to change status must be made on the basis of the combination of skill mix, individual patient requirements and available contingencies and not solely on the rate of STEAM:

Green: Staffing is consistent with normal rota, STEAM is below 60%
No unusual contingencies are required to maintain normal and safe services.

Amber: Normal skill mix is compromised, STEAM is above 60%
Some contingencies have been put in place but the department continues to function safely.

Red: Normal skill mix is seriously compromised, STEAM is above 80%
All contingencies have been put into place and the department may need to be closed to admissions.

Black: This level is very rarely used and denotes a major event instigated by the Executive
All organisational resources are made available and several departments function within a state of emergency.

Prior to changing status up to Amber, the following should have already been considered and instigated:
a. Complete the individual patient assessment for all cases
b. Review medical and nursing staffing rota/skill mix and reschedule staff appropriately where possible
c. Identify potential admissions and implications of activity across allied departments
d. Assess levels of operational and clinical equipment to ensure availability against increased activity
e. Delay or postpone non essential planned activities, meetings and appointments
f. Contact Nursing Bank (or Agency) to enquire on availability of staff

Prior to changing status up to Red, the following should have already been considered and instigated:
g. All of the above, a to f, reviewed and reconsidered
h. Assess status of allied departments and where appropriate those of adjacent organisations within the clinical network
i. Contact the on-call Senior Nurse and Consultant for advice or attendance
j. Secure additional bank, agency or locum staff

Admission Status

The decision to close a department to admissions can only be made by the Senior Consultant or Head of Nursing. In the event of a closure, the department's Closure Protocol must be instigated and communicated to all stakeholders, as per those instructions. The rate of STEAM and the clinical status do not automatically constitute or discount the closure of a department. Safety comes first.