A review of nursing skill-mix to optimise care in an acute trust

developments, including:

- Initiatives introduced in accordance with The NHS Plan to develop new nursing roles that improve patient access and responsiveness, especially nurse-led services and diagnostic and referral procedures;
- Procedures previously performed by doctors being delegated to nursing staff due to the reduction of junior doctors’ working hours, in accordance with the European Working Time Directive;
- Recent attempts to make nursing students’ clinical learning experiences more meaningful by ensuring that 50 per cent of their preregistration training takes place in the practice environment;
- The introduction of new pathways into nursing that enable HCAs to enter preregistration nurse education via NVQ schemes, which also enable the HCAs to increase their clinical skills.

The skill-mix exercise

The main aims of the skill-mix exercise were:

- To review how the skills and competencies of nursing staff were currently deployed;
- To identify any potential for utilising the skills within nursing teams in inpatient areas more effectively;
- To conduct a workload analysis;
- To review the current skill-mix alongside the current nursing establishment;
- To provide a framework for future decision-making on the development of the nursing workforce.

A steering group was established to lead the project. This consisted of the trust’s director and assistant director of nursing, director of operations, clinical services unit manager, human resources manager, practice development nurse, a nurse consultant and the lead sister (modern matron). A sub-group was given the task of examining how nursing procedures were currently deployed within nursing teams, including both registered nurses and HCAs.

Method

A framework, adapted from a skill-mix study conducted by the Centre for Health Economics, University of York (Carr-Hill et al, 1992), was compiled listing 112 nursing tasks in 12 groups:

- Communication with patients;
- Nutrition;
- Hygiene;
- Elimination;
- Medication;
- Vital signs;
- Nursing procedures;
- Escorting patients;
- Admitting and discharging patients;
- Interprofessional communication;
- Teaching and supervising staff;
- Administration.

A copy of the framework was sent to all ward sisters/charge nurses in the trust, along with an explanatory letter asking them to indicate which grade of staff they considered competent to carry out each task. They were also asked to add any nursing tasks that had not been included in the framework, and invited to attend a consensus meeting organised for their specialty to discuss the framework and the skill-mix review. Attendance at the consensus meetings were as follows:

- Orthopaedics: five out of six ward sisters attended plus the lead sister;
- Elderly care: all five ward sisters attended plus the lead sister;
- Medicine: 12 out of 14 ward sisters attended plus two lead sisters;
- Surgery: three out of seven ward sisters attended plus four lead sisters.

Consensus meetings

A number of clinical procedures that had been identified by the ward sisters were added to the relevant sections at the consensus meetings. All existing items were also reviewed individually and consensus was reached as to which grade of staff was deemed competent to perform each procedure.

Discussion then took place to explore how many of the

<table>
<thead>
<tr>
<th>Specialty</th>
<th>Orthopaedics</th>
<th>Elderly care</th>
<th>Medicine</th>
<th>Surgery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of tasks</td>
<td>46</td>
<td>53</td>
<td>49</td>
<td>53</td>
</tr>
<tr>
<td>Percentage</td>
<td>41%</td>
<td>47%</td>
<td>43%</td>
<td>47%</td>
</tr>
</tbody>
</table>
TABLE 2. PROCEdures for which there was a lack of consensus as to who should perform them

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Health care assistant</th>
<th>RN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient teaching</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Urinary-catheter removal</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Applying prescribed topical</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>preparations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vascular limb observations</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Redressing wounds</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>3aseptically</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contributing to ward rounds</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Completing incident forms</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

TABLE 3. RESULTS OF THE DEPENDENCY AUDIT

<table>
<thead>
<tr>
<th>Dependency category</th>
<th>Number of patients (n=450)</th>
<th>Percentage of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>61</td>
<td>13.5%</td>
</tr>
<tr>
<td>2</td>
<td>137</td>
<td>30.4%</td>
</tr>
<tr>
<td>3</td>
<td>137</td>
<td>30.4%</td>
</tr>
<tr>
<td>4</td>
<td>93</td>
<td>20.6%</td>
</tr>
<tr>
<td>5</td>
<td>22</td>
<td>4.9%</td>
</tr>
</tbody>
</table>

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The main resource of the NHS is its workforce. However, achieving the correct mix of staff is crucial if it is to provide high-quality patient care in a cost-effective manner. When an acute trust was singled out in an independent analysis as having ‘too rich’ a skill-mix (compared with the rest of the strategic health authority), an internal review was undertaken to determine the ratio of qualified to unqualified nursing staff, and to compare these with acuity and dependency in each clinical area. The information was used to revise the nursing skill-mix within the trust.

Skill-mixing is an important part of workforce planning within the NHS and is crucial if cost-effective and appropriate care is to be delivered to all patients. In most trusts the nursing workforce – registered nurses and midwives, and health care assistants (HCAs) – represents the largest single staff group and their salaries constitute the largest item in the annual budget.

A poorly planned nursing skill-mix, therefore, can have a huge impact on trust finances and quickly lead to significant overspending. However, while it is vital to keep a close eye on nursing skill-mix, it cannot be assessed in isolation from a trust’s total skill-mix, as this is indicative of the actual workload assigned to the nursing workforce.

There has been significant variation in skill-mix among the different trusts across the Thames Valley Strategic Health Authority and other teaching trusts in the South East. The Royal Berkshire and Battle Hospitals NHS Trust (RBBH) provides acute district hospital services to a population of 500,000 in one of the most affluent areas of the UK and provides specialist cancer, ophthalmic and renal services to the whole of Berkshire. In an independent analysis of hospital care conducted by the Dr Foster Unit at the Imperial College of Science, Technology and Medicine, the trust was described as having a very ‘rich’ skill-mix in terms of the ratio of qualified to unqualified nursing staff.

A detailed exercise was therefore conducted across the trust to determine the optimum skill-mix within each ward and department. The exercise took account of workload and acuity within each clinical area, and the input of specialist nursing practice required. The information gathered was compared with the budgeted establishment to determine whether adjustments would be required and whether any nursing posts could be converted into HCA posts. The total nursing workforce was also scrutinised at the same time to determine the overall and local ratio of nurses to beds within the trust.

The results of this skill-mixing exercise were presented to the executive committee as part of the trust recovery plan requested by the trust board after it was realised that the trust had incurred a £10m financial deficit. Lead sisters and clinical service unit managers within each specialist area have been given the responsibility of acting on its findings.

Skill-mix reviews

Three skill-mix reviews of nursing staff have been undertaken at the RBBH over the past 10 years, at approximately three-year intervals. These reviews have been conducted by both in-house personnel and outside agencies, and have used various methodologies for collecting data on patient dependency and acuity across the trust. This data has been used to forecast the ratio of registered nurses to HCAs required within individual clinical areas.

The review reported here was undertaken at the request of the trust’s key stakeholders – the strategic health authority, primary care trusts and the trust board – to provide up-to-date information on the current nursing workforce. It was also considered important to determine the impact on the nursing workforce of recent NHS

REFERENCES


required. Examples might be patients who are dying or those with severe asthma.

**Acute maximum care**

This level of care is provided for patients who require periods of constant nursing supervision. Their requirements are similar to those of a patient in a high dependency unit. Support by technical equipment may also be required. A patient who is aggressive (perhaps as a result of head injury) would require this high level of care, for example.

Twenty-one wards (50 per cent) returned an audit form, meaning a total of 450 (50 per cent) patients were audited out of a possible 916 (Table 3). The ‘average’ dependency category for all patients was effectively 2.72.

Acuity can be demonstrated by sampling the patients and scoring their Modified Early-Warning System (MEWS) score (Morgan et al, 1997). This allocates a score to various observation results (Table 4). A total MEWS score of three or four means the patient requires outreach or medical intervention; five and above is more likely to result in the patient’s admission to critical care, or death.

MEWS scores were collected on all patients in the trust. Twenty-five of the patients were found to have scores of three or above (Table 5).

On average at any one time the trust could expect to be caring for 25 patients requiring outreach care or medical intervention. It would also have three patients at risk of serious deterioration and requiring input from a senior medical practitioner or support from the critical care outreach team.

**Nursing establishment**

Workforce data from finance and human resources was scrutinised to generate an overall picture of the trust’s nursing skill-mix. This was further analysed by ward and clinical area and other nursing staff in both nursing and non-nursing roles were identified (Table 6). Staff were put into four categories – general nursing, midwifery, clinical nurse specialists, and other.

Clinical nurse specialists performed enhanced clinical roles involving:

- Diagnostic responsibilities, following set protocols;
- Running nurse-led clinics;
- Therapeutic management.

They were also responsible for a range of tasks formerly undertaken by junior doctors, such as IV insertion, critical care outreach and long-line insertion.

The ‘other’ category consisted of senior or specialist nurses who provided core functions across the trust and remained on nursing grades. These functions included training and education, resuscitation, practice development and lecturer/practitioners. As this is a teaching trust these posts both enhanced practice within the clinical areas and learning in practice for both pre and post-registration nurses. All these staff maintained their practice by working regularly in the clinical areas attached to their specialty.

Other groups of senior staff included those involved in bed management and discharge facilitation, those carrying out the senior nursing roles across the whole trust, and the night sisters, who had a supervisory role across the trust’s two sites. Occupational health nurses provided services to staff within the trust and across west Berkshire. A small number of whole-time equivalent (WTE) posts (2.5) identified as nursing grades were not involved in direct care – these posts were involved with risk management and customer care in the information-management department.

Overall, 96 per cent (1,708.76 WTE) of the trust’s nurses worked in clinical roles, with four per cent (70.25 WTE) involved in non-ward or department-based activities. Of those there were 31 clinical nursing specialists whose enhanced nursing role enabled them to deliver

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**TABLE 4. MODIFIED EARLY-WARNING SYSTEM SCORES (ADAPTED FROM: MORGAN ET AL, 1997)**

<table>
<thead>
<tr>
<th>MEWS Score</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respiration per minute</td>
<td>8 or less</td>
<td>9–14</td>
<td>15–20</td>
<td>21–29</td>
<td>30 or more</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heart rate per minute</td>
<td>40 or less</td>
<td>41–50</td>
<td>51–100</td>
<td>101–110</td>
<td>111–129</td>
<td>130 or more</td>
<td></td>
</tr>
<tr>
<td>Blood pressure (systolic) mmHg</td>
<td>70 or less</td>
<td>71–80</td>
<td>81–100</td>
<td>101–199</td>
<td>200 or more</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consciousness level</td>
<td>Unresponsive</td>
<td>Responds to pain</td>
<td>Responds to voice or new confusion</td>
<td>Alert</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urine ml/hour in two hours</td>
<td>0</td>
<td>30 or less</td>
<td>31–41</td>
<td>45 or more</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
procedures currently only being undertaken by registered nurses could be delegated to C-grade HCAs who had received appropriate training.

At the time, 41–47 per cent of all nursing tasks were being carried out by A and B-grade HCAs (Table 1, p34). There was agreement across all specialties that a number of procedures should only be performed by registered nurses (RNs). These related to:

- Planning and evaluating patient care;
- Dispensing and administering medications;
- Complex or invasive nursing procedures.

However, there was a lack of consensus across the four specialties with regard to a number of the procedures. Table 2 (p35) lists the disputed procedures and the number of specialties recommending they should be performed by HCAs or nurses.

The sisters/charge nurses were invited to consider the potential for delegating tasks to C-grade HCAs that were currently only performed by RNs, providing the HCAs had received appropriate training and attained the necessary competencies. Although there was not unanimous agreement, some considered the following procedures as ones which could be delegated:

- Catheterising patients;
- Passing nasogastric tubes;
- Feeding a patient who has swallowing difficulties;
- Feeding a patient via gastrostomy/nasogastric tube;
- Removing clips or sutures;
- Recording neurological observations.

There was no general consensus as to which clinical procedures should or could be safely delegated to appropriately trained C-grade HCAs. It was agreed that the decision to increase an individual’s responsibilities should therefore be taken on the basis of a training-needs analysis, clinical-risk assessment and in further consultation with the nurses who would retain the accountability for patient care. It was acknowledged that the legal implications of delegating clinical tasks to non-professional staff would have to be considered in association with the NHS Litigation Authority.

Further discussions are now taking place about the possibility of C-grade HCAs being enabled to take on roles in risk management, the facilitation of back-care training and other mandatory training. The model being considered would involve designating one HCA per specialist area. These HCAs would not be part of any current specialist HCAs, although they would work in conjunction with the nurses who would retain the accountability for patient care.

The workload analysis

There is some variation in dependency and acuity of patients across the different wards and departments. A ward may appear to be ‘heavy’ with dependent patients, but may have an average low acuity. Similarly an acutely ill patient who appears to be quiet and undemanding may in fact be becoming critically ill. The skilled observation needed to nurse patients with a higher acuity are more specialised than those needed to care for heavily dependent patients, so wards treating a large number of patients with high acuity will need a higher ratio of registered nurses in their skill-mix.

The trust has recognised this and has audited both dependency and acuity in the past to determine the skill-mix required for each clinical area. It has done this using a dependency model created as part of an ongoing collaborative project between the Royal Berkshire Hospital and the University of Southampton.

It is important to undertake this audit regularly, as capacity and activity changes around the trust over time and wards are used in different ways to ensure maximum efficiency in each area. An audit was therefore conducted for this skill-mix exercise during a one-week period to ensure the information available to the project was up to date.

The Southampton dependency model defines five categories of dependency. These categories refer to patients nursed on a ward, day-case unit or similar, and are not intended to cover high dependency or intensive care.

**Minimal care**

This is for patients who are physically capable of caring for themselves and require minimal nursing supervision. They may require treatment and/or monitoring such as temperature, pulse, respiration and clinical observations.

**Moderate care**

Moderate care is appropriate for patients requiring a moderate amount of nursing care with nursing supervision. Some assistance with personal care, treatments and observations will also be required. Examples might be an independent patient requiring extensive investigative procedures or a patient recovering from an acute stage of an illness.

**Significant care**

This level of care is appropriate for patients requiring a considerable amount of nursing care with nursing supervision and encouragement. Almost complete assistance will be required to meet these patients’ personal care needs and sometimes the use of special equipment may be necessary.

**Maximum care**

Maximum care is provided for patients requiring very frequent or high-level nursing care with supervision or support from other members of the multidisciplinary team. Support by technical equipment may also be

| TABLE 5. PATIENTS WITH MEWS SCORES OF THREE OR ABOVE |
|-----------------|-----|-----|-----|-----|
| MEWS score      | 3   | 4   | 5   | 6   |
| Number of patients in general wards | 15  | 7   | 2   | 1   |
direct patient care, at both clinic and ward level. The trust had an overall ratio of 2.3 registered nurses to each patient bed (excluding day beds or outpatient beds).

Establishment by ward

The skill-mix was reviewed by ward and department by analysing both the budgeted and actual establishment of registered and HCAs in each area. Overall there were 1,521.81 WTE registered nurses, midwives and clinical nurse specialists and 434.54 WTE HCAs, a skill-mix ratio of 38:11.

Variations across the trust were noted, but in most cases the actual skill-mix was in line with the number of beds and related to the acuity of an area. There were, however, some exceptions where the number of registered nurses appeared disproportionate to the level of acuity within that clinical area.

Areas of higher acuity already had a higher skill-mix and much work had already been done within areas of high dependency, such as care of older people and orthopaedics, to increase the numbers of HCAs in relation to registered nurses.

Establishment was based on one nurse per bed within wards with an added margin of 20 per cent to allow for leave, sickness and mandatory training. Within clinics and departments this was based on workload and the numbers of sessions provided to patients, but the use of clinical nurse specialists had not been taken into consideration as these posts had evolved.

Recommendations

The exercise resulted in a number of recommendations. It has been recommended that a skill-mix ratio should be applied according to the acuity of each clinical area. Where acuity is higher there should be a skill-mix of 70:30 and where dependency is higher, 50:50. Areas where there is a disproportionate skill-mix ratio should be supported to address the imbalances.

The highest ratio of registered nurses to HCAs – 90:10 – was within the A&E department, yet a comparable ward emergency medical unit had a skill-mix of 64:36 registered nurses to HCAs. However, comparison with local hospitals revealed similar ratios within other A&E departments. The justification for such a rich mix has been that HCAs cannot undertake patient assessments. In order to reduce the skill-mix, clearer role definitions are required for all grades of HCAs, including updated job descriptions linked to competencies. The role of C-grade HCAs is currently being developed to enable them to take increased responsibility, but accountability for patient care will remain the responsibility of the registered nurse.

The other area of high skill-mix was within the outpatient areas. It was suggested that a full review of all staffing within ambulatory departments takes place to determine the roles of both registered nurses and HCAs within these departments. This should take into consideration the roles of the clinical nurse specialists.

It was also recommended that due to the high numbers of days lost through training and education all training leave be scrutinised by lead sisters, who would have overall responsibility for maintaining adequate staffing levels within their clinical areas. Some central guidance will be issued for this.

A review is to be undertaken of the trust’s nursing induction programme, annual mandatory training and courses run in-house, including the degree pathways that are validated by Thames Valley University. The content will be measured in hours and training grouped together to reduce days lost through training.

Implementation

The information obtained from this report will also be used to facilitate the placement of student nurses across the trust, as areas with high numbers of registered nurses will be expected to provide more placement opportunities. The trust currently offers 210 preregistration nursing and midwifery placement opportunities. The ratio of registered nurses to student placement opportunities is 6:1. However, the clinical placement facilitator believes that this should be reduced to 4:1 to increase the student placements across the trust.

The recommendations stemming from the review have been implemented locally by both the lead sisters/modern matrons and general managers with support from the skill-mix review steering group. This work has been seen as very collaborative and there is now a much greater understanding of the issues of workforce develop-

<table>
<thead>
<tr>
<th>Grade</th>
<th>A and B</th>
<th>C</th>
<th>D and E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
</tr>
</thead>
<tbody>
<tr>
<td>General</td>
<td>330.31</td>
<td>11.87</td>
<td>779.89</td>
<td>181.79</td>
<td>112</td>
<td>9.73</td>
<td>13.8</td>
</tr>
<tr>
<td>Midwifery</td>
<td>41.03</td>
<td>5.2</td>
<td>3.96</td>
<td>61.67</td>
<td>60.12</td>
<td>12.3</td>
<td>4</td>
</tr>
<tr>
<td>Clinical nurse specialists</td>
<td>1</td>
<td>3.47</td>
<td>23.74</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>8.78</td>
<td>15</td>
<td>12.26</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>371.24</td>
<td>17.0</td>
<td>783.8</td>
<td>253.2</td>
<td>190.5</td>
<td>58.0</td>
<td>23.8</td>
</tr>
</tbody>
</table>