# Safe staffing for nursing in A&E departments

## NICE safe staffing guideline

## Draft for consultation, 16 January to 12 February 2014

## Appendix 1: Evidence to recommendations tables

# 1 Organisational strategy

**Recommendations**

**Focus on patient care**

1.1.1 Ensure that patients attending A&E departments receive the nursing care they need at all times of the day and night, on weekdays and at weekends.

**Accountability for A&E nursing staff establishments**

1.1.2 Develop procedures to ensure that there are enough registered nurses and non-registered nursing staff (referred to as the A&E nursing staff establishment) to provide safe care at all times to patients attending A&E departments. The board should ensure that the budget for the A&E department covers the required nursing staff establishment.

1.1.3 Ensure that all A&E departments have the capacity to:

- Deliver the care that all patients need from the time of attendance at the department, through initial and on-going assessment, and care delivery to discharge.
- Provide triage, minor, major, resuscitation and paediatric A&E services, and where appropriate major trauma A&E services.
- Provide staff to cover all the nursing roles needed for each shift, including coordination and oversight of each shift.
- Provide specialist input for children by having a registered children's nurse on each shift or, where the level of service provided does not warrant this, at least 1 A&E nurse on each shift with education, training and competency in children's nursing.
- Provide specialist input for older people, people with learning disabilities, sensory impairment, mental health needs (including dementia) or complex psychosocial needs, and to address language barriers.
- Allow for the following:
    - Uplift (for example, annual leave, maternity leave, paternity leave, study leave and sickness absence).
    - Time for all A&E nursing staff to provide and receive specialty specific continuing professional development and statutory and mandatory training.
    - Time for all A&E registered nurses to provide training and mentorship for student nurses.
    - Time for all A&E registered nurses to provide training and supervision for non-registered nursing staff.
- Predict and respond to variation over time as indicated by records of A&E nursing staff requirements (for example, changes in demand for A&E services).

1.1.4 Develop procedures to ensure that the A&E nursing staff establishment is developed by registered nurses with:

- responsibility for determining nursing staff requirements at

A&E departmental level and

- experience and training in setting staffing establishments.

1.1.5 Procedures should ensure that the chief nurse (or delegated accountable staff) approves the A&E nursing staff establishment.

1.1.6 Ensure that senior nursing managers (for example, A&E matrons) are accountable for the A&E nursing staff roster that is developed from the A&E nursing staff establishment.

**Organisational level actions to enable A&E responsiveness**

1.1.7 Develop escalation plans to address risk to patient care posed by:

- variation in demand for A&E services
- variation in nursing needs
- departmental crowding.

1.1.8 Develop escalation plans in collaboration with A&E registered nurses with responsibility for determining nursing staff requirements at A&E departmental level.

1.1.9 Determine the level of risk at which escalation plans should take effect locally, taking into account the size of the A&E department and the availability of neighbouring services.

1.1.10 Ensure that escalation plans contain actions to address variation in demand for A&E services and nursing needs in the A&E department. These may include:

- addressing patient flow issues throughout the organisation
- moving patients out of the A&E department to an appropriate alternative location
- sourcing extra staff (for example, using an on-call system).

1.1.11 Ensure that escalation plans also contain actions to:

- make the A&E department safe if departmental crowding cannot be resolved
- respond to deficits in A&E nursing staff without compromising patient care in other parts of the hospital.

1.1.12 Procedures should ensure that the chief nurse (or delegated accountable staff) approves actions within escalation plans related to A&E nursing staff.

1.1.13 Develop action plans to address crowding in A&E departments in collaboration with other organisations to facilitate a whole system response. These might include:

- mental health trusts
- ambulance trusts
- primary and community services
- social care services.

1.1.14 Facilitate and promote multidisciplinary working in the A&E department.

**Monitor adequacy of A&E nursing staff establishments**

1.1.15 Review the A&E nursing staff establishment at board level

at least every 6 months, ensuring that the review includes analysis of:

- nursing red flag events (see box 3)
- safe nursing indicators
- data on variation in demand for A&E services.

1.1.16 Review the A&E nursing staff establishment at board level more frequently than every 6 months if:

- staff absenteeism is increasing
- departmental crowding occurs frequently
- A&E nursing staff deficits occur frequently
- escalation plans are implemented frequently
- local services are reconfigured and this may impact on demand for A&E services.

1.1.17 Change the A&E nursing staff establishment if the review indicates this is needed.

1.1.18 Discuss the A&E nursing staff establishment with commissioners at least every 12 months (this may be part of contract reviews).

**Monitor and respond to changes**

1.1.19 Ensure that there are procedures in place for monitoring and responding to unexpected changes in A&E nursing staff requirements throughout a shift.

1.1.20 Ensure that there are procedures in place for:

- informing members of staff, patients, family members and carers what nursing red flag events (see box 3) are (for example, by publicising them in the A&E waiting room)
- enabling members of staff, patients, family members and carers to report nursing red flag events (see box 3) to the A&E registered nurse in charge of the shift
- monitoring and responding to nursing red flag events (see box 3).

1.1.21 Ensure that responses to nursing red flag events and unexpected changes in A&E nursing staff requirements do not cause nursing red flag events in other parts of the hospital.

**Promote staff training and education**

1.1.22 Ensure that all A&E nursing staff receive training to deliver the care they are required to provide, including:

- specialty specific continuing professional development
- statutory and mandatory training
- training in providing care for children, older people, people with learning disabilities, sensory impairment, mental health needs (including dementia) or complex psychosocial needs, and in addressing language barriers.

1.1.23 Ensure that all A&E nursing staff have time allocated for:

- training and mentoring student nurses on placement in the

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| | A&E department or non-registered nursing staff<br>• supervising and assessing the competencies of non-registered nursing staff<br>• taking part in clinical governance activities (for example, audit).<br>1.1.24 Ensure that A&E registered nurses have time allocated for activities related to setting the A&E nursing staff establishment, and assessing the nursing staff needed for each shift, including collecting and analysing data.<br>1.1.25 Involve A&E nursing staff in developing and maintaining nursing staff policies and governance, including escalation planning. |
| **Evidence summary** | The evidence review addressed 5 review questions that aimed to explore what factors (staffing, patient, environmental and organisational) should be used to determine A&E nursing staff requirements. For organisational factors, 1 study with a weak quality rating met the inclusion criteria. No economic evidence was identified.<br><br>The included retrospective observational study used statistical modelling to explore the impact of changing organisational variables (such as annual average of nurses, physicians and physical bed capacity reported by the hospital) on patient care time. The study found that a combined increase in the number of nurses, physical bed capacity and the number of doctors at an organisational level, was associated with a reduction in the average waiting time of patients in ED. The study was conducted in Australia and the quality was weak for internal and moderate for external validity. |
| **Committee considerations** | **Consideration of the included evidence**<br>The committee discussed the included study and noted that the study counted the number of doctors within the hospital rather than within the A&E department specifically and did not take into account the time of day. It was also acknowledged that studies conducted in Australia may be more similar to UK based practice compared with other countries. Overall, the committee agreed that there was a lack of evidence directly examining the association between organisational factors and serious incidents such as death or medication errors.<br><br>**Minimum functions of A&E departments**<br>The group discussed the minimum functions that all A&E departments should be capable of carrying out. These functions included delivery of care needed, the provision of triage, resuscitation and paediatric A&E services, provision of staff to cover all nursing roles (including coordination and oversight of each shift) and the provision of specialist input for subgroups of the population such as children, older adults and people with learning difficulties.<br><br>**Variation in demand for A&E services** |

The committee also discussed variation in the demand for A&E services. It was agreed that some variation was predictable and staffing requirements could be adjusted for example to reflect an increased demand after bank holidays. However, it was also noted that some variation was unplanned (for example due to unplanned staff absence, unexpected fluctuations in patient demand or nursing needs or departmental crowding) and staffing levels would need to be adjusted quickly to meet this demand. The committee agreed that escalation procedures at an organisational level should be in place to enable A&E departments to meet unplanned increases in demand for services.

**Crowding**

The committee discussed the issue of crowding in A&E departments in detail. In particular it was noted that crowding is common in A&E departments in the UK and this is often due to problems with discharge from A&E or transfers to other wards. Furthermore, it was noted that most of the time crowding may be linked to poor outcomes such as increased waiting times and missed care.

**Escalation plans**

The committee agreed that escalation policies should be in place to address any risks to patient care which may be a result of variation in patient demand or nursing needs and to enable A&E departments to cope with crowding. It was recognised that these procedures may be difficult to translate into practice and therefore should be agreed locally in order to manage local service configurations and needs. The group agreed that all escalation plans should include details around the level of risk at which action should be taken, although it was recognised that this may vary locally depending on the size of the A&E and the availability of neighbouring services. The committee also discussed that escalation procedures should not impact on patients care in other parts of the hospital. For example using staff from other areas within the hospital may not be appropriate as they may not have the skills and experience required for A&E settings. In addition this approach may not be sufficient if appropriate staff are not available when an increase in demand is observed. Therefore the committee agreed that escalation plans should include a number of options that could be used and different levels of escalation. People should be able to use escalation plans progressively because in practice, actions may not always be successful in coping with the additional demand. The group also emphasised the importance of a whole system response to successfully implement actions to address crowding.

The committee felt the use of escalation plans may have some additional cost implications for some organisations (such as provision of additional staffing) but agreed that it is a necessary requirement for safe care to be delivered in A&E settings.

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| | **Accountability for implementation**<br>The committee agreed that it was of upmost importance to ensure that senior managers, board and commissioners are accountable for staffing decisions in order to support the implementation of the recommendations. As part of this discussion, the group agreed the implementation of some escalation plans may be difficult and accepted that some plans relying on additional temporary staffing may be costly to implement but would be needed to ensure safe care for all patients. The committee also agreed that the organisational context for A&E nursing staff is the same as the organisational context for nurse staffing in adult inpatient wards in acute hospitals. Therefore the committee extrapolated from the evidence and recommendations that were part of the organisational recommendations that were developed for the safe staffing for nursing in adult inpatient wards in acute hospitals. The committee reviewed each of the recommendations that were developed for the acute adult inpatient guideline. Recommendations that were based on evidence that was not relevant to A&E nursing staff were removed, and recommendations that could be adapted for A&E nursing staff were amended and used.<br><br>**Equality issues**<br>The committee discussed equality issues that may impact on the recommendations. Specifically, it was agreed that children and young people who attend A&E require access to specialist input from a children's nurse. Similarly it was also discussed that nurses may need additional training to provide care for people with additional support needs such as older adults and people with learning difficulties. |
| **Summary of link to recommendation area** | **Focus on patient care (recommendation 1.1.1)**<br>• Overall, the committee reviewed the recommendation on patient care that was used in the safe staffing guideline for nursing in adult inpatient wards in acute hospitals and agreed that this would also be relevant to A&E settings.<br><br>**Accountability for A&E nursing staff establishments (recommendations 1.1.2 to 1.1.6)**<br>• Overall, the committee reviewed organisational recommendations that were used in the safe staffing guideline for nursing in adult inpatient wards in acute hospitals and agreed that these would also be relevant to A&E settings. The committee made specific recommendations for the minimum functions that all A&E departments should be able to carry out.<br>• The committee agreed that the specific recommendations were unlikely to have a substantial cost impact and felt the recommendations should be easily implemented.<br><br>**Organisational level actions to enable A&E responsiveness (recommendations 1.1.7 to 1.1.14)**<br>• Overall, one included study showed that increased numbers |

of doctors, nurses and physical bed capacity in hospitals may be associated with a reduction in the average waiting time for patients.

- The committee agreed that specific recommendations on flexibility in A&E nursing staff provision and the use of escalation procedures were important to ensure departments were able to cope with unplanned variation in demand. In addition it was agreed that escalation plans should be determined locally to ensure they are specific to local service configurations and reflect local need. The committee made a specific recommendation to ensure escalation plans contained several possible actions and levels of escalation. This was considered important as not all actions taken to cope with increased demand will be successful in practice.
- The committee agreed that developing procedures to enable A&E responsiveness may have additional costs to and felt the recommendations may be challenging to implement in some organisations.

**Monitor adequacy of A&E nursing staff establishments (recommendations 1.1.15 to 1.1.18) and monitor and respond to changes (recommendations 1.1.19 and 1.1.21)**

- Specific recommendations were made to ensure nursing red flags, indicators, variation in A&E demand and feedback from other organisations involved in whole system responses to A&E crowding were included in the board's review of the nursing staff establishment. This was because the committee felt it was important to identify all possible risks to patient safety as early as possible.
- A specific recommendation to review A&E nursing staff establishments more frequently than 6 monthly was made to ensure that if needed, staffing requirements are amended to reflect changing local demands.
- The committee agreed that monitoring adequacy of A&E nursing staffing establishments on a 6 monthly basis may have a small increase in cost and may require development to develop robust systems for implementation.

**Promote staff training and education (recommendations 1.1.22 and 1.1.25)**

- Overall the committee felt that recommendations on training and education that were used in the safe staffing guideline for nursing in adult inpatient wards in acute hospitals were also relevant for A&E nursing staff.
- The committee agreed that the specific recommendations were unlikely to have a substantial cost impact and felt the recommendations should be easily implemented.

# 2 Setting the A&E department nursing staff establishment

**Recommendations**

1.2.1 Determine the nursing staff establishment for the A&E department at least every 6 months.

1.2.2 Use the following systematic assessment to calculate the A&E nursing staff establishment. Evidence-based toolkits endorsed by NICE could be used to support this assessment:

- Use historical data on demand for A&E services over at least the past 2 years to predict likely nursing hours for the next 6 months.
- Determine the average A&E nursing workload according to day of week and time of day over 7 days. Consider the following as a prompt:
  - patient, environmental and staffing factors (box 1)
  - nursing care tasks and activities (box 2).
- Estimate the nursing time needed to perform the nursing care tasks and activities (box 2).
- Calculate the total nursing hours that are needed over 7 days.
- Identify the nursing care activities for which A&E registered nurses are responsible and the activities that can be safely delegated to trained and competent non-registered nursing staff. Base this on the local configuration of services and range of staff available (such as registered nurses with specialist skills [for example, mental health]).
- Increase the weekly average number of nursing hours to account for the following:
  - uplift (annual leave, maternity leave, paternity leave, study leave and sickness absence); determine the rate of uplift locally
  - variation in predicted demand and the need for flexibility in deploying nursing staff across the A&E department (the daily average number of nursing hours should meet no less than the average daily demand [based on a similar day or the same day in previous years] plus at least 1 standard deviation)
- Divide the calculations by 37.5 to determine the number of whole time equivalents needed for the A&E nursing staff establishment.

1.2.3 Check that the calculations in recommendation 1.2.2 provide enough A&E nursing staff to meet the following minimum nurse-to-patient ratios and adjust if necessary:

- 1 registered nurse to 1 cubicle in triage
- 1 registered nurse to 4 cubicles in minors and majors
- 1 registered nurse to 2 cubicles in the resuscitation area.

1.2.4 Check that the calculations in recommendation 1.2.2 provide enough A&E nursing staff to meet the following nurse-to-

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| | patient ratios for the following situations when needed:<br>• major trauma (2 registered nurses to 1 patient)<br>• cardiac arrest (2 registered nurses to 1 patient)<br>• priority ambulance calls (1 registered nurse to 1 patient)<br>• family liaison (1 registered nurse to 1 patient's family/carers).<br>1.2.5 Ensure that 1 band 7 (or equivalent) registered nurse is included on every shift at all times to lead, supervise and oversee the shift.<br>1.2.6 Use professional judgement when undertaking the systematic assessment and checking the calculations for the A&E nursing staff establishment.<br>1.2.7 Base the A&E nursing staff roster on the A&E nursing staff establishment calculations, taking into account any specific times of the day or week when the A&E department is likely to be busy. Consider staggering shift start times of individual nursing staff to correspond with peaks in demand. |
| **Evidence summary** | The evidence review addressed 3 review questions that aimed to explore what factors (staffing, patient and environmental) should be used to determine A&E nursing staff requirements. The following studies were included;<br>• Staffing factors (2 studies included) - one study showed that the introduction of a specialist psychiatric nurse service was associated with more appropriate referrals but there was no impact on waiting times, repeat attendances or satisfaction. One further study showed that staff absenteeism was increased when fewer nurses were scheduled for a shift<br>• Patient factors (1 study included) - one study showed that as nursing workload increases, nurses spend the longest amount of time providing indirect patient care.<br>• Environmental factors (0 studies) - no evidence was identified<br><br>In addition there was a further review question that aimed to identify the method that should be used to determine nursing staff requirements. For this question, 2 studies were identified that met the inclusion criteria. There was no strong evidence to support a specific toolkit or approach to determine nursing staff requirement in A&E. Two studies were identified; one UK based study found the Jones Dependency Tool was reliable for assessing patient dependency and could be used for calculating nursing workload in A&E. There was a lack of information on the reliability or validity of the tools in the other study to ascertain their utility or quality in practice.<br><br>Generally, the quality of the included studies for these review questions was weak.<br><br>No economic studies were identified. The de novo economic analysis developed for this guideline showed that: |

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| | • Low nursing skill mix and low staff numbers will have a negative impact on outcomes (more patients leaving without being seen, higher average duration in A&E departments and higher occupancy).<br>• Variation in attendance volumes and spikes in attendance volume in A&E department can cause significant effects on outcomes.<br>• Moving towards a higher average skill mix of nurses might improve some patient and process outcomes. |
| **Committee considerations** | **Consideration of the included evidence**<br>The committee agreed that there was a lack of evidence directly examining the association between nursing staff and serious incidents such as death or medication errors. Therefore it is difficult to establish whether the use of particular factors to determine staffing requirements has an impact on safety.<br><br>The committee discussed the evidence relating to patient, environmental, staffing and organisational factors that should be used to determine nursing staff requirements. Overall, the evidence was difficult to interpret and findings were often unclear as some studies showed that particular factors were significantly related to A&E nursing staff, whereas other studies found the same factors were not significantly related to A&E nursing staff. In particular the committee discussed the following limitations of the evidence:<br>• Lack of data on rare events: many of the important safety outcomes that occur in A&E settings, such as death, are relatively rare. A very large sample would need to be examined to detect statistical differences in death rates according to variance in staffing numbers. This means that if a study is too small, it is difficult to establish if the lack of a statistically significant finding is because there is no relationship, or because the sample was too small to observe the relationship.<br>• Endogeneity: This problem can occur when an outcome is partly determined by an explanatory factor. For example, when adverse outcomes are felt more likely to happen in a particular area of care, more qualified staff might be allocated to that area of care. This means that the techniques used in research to analyse the data can over- or under- estimate the impact of a factor (such as staffing) on an outcome (such as adverse effects).<br>• Multicolinearity: This problem is caused when two or more explanatory factors being examined are highly correlated meaning that one can be closely predicted from the other (e.g. staffing and clinical risk, as it is likely that more staff will be required for higher risk cases).<br><br>**Consideration of economic evidence**<br>The committee carefully considered the implications of the de novo economic analysis produced for this guideline. It agreed that the overall model structure was representative of a typical A&E department. The committee agreed with the findings that variation |

in attendance volumes and that spikes in attendance volume in A&E department can cause significant effects on outcomes and felt that variation in attendances should be considered carefully in establishment planning and when considering responsiveness to patient demand. The committee agreed that low staffing levels and a lower skilled workforce would likely result in worse outcomes (longer average duration in A&E, number of patients per nursing staff, average occupancy, and proportion of patient who leave without being seen)

The committee debated the strength of the association between staff skill mix and pay (pay bands were used a proxy for productivity on the economic analysis). The committee agreed that using nurse pay bands as a proxy measure of a nurse's productivity and skills may be inaccurate because nurses on different bands (such as a band 7 nurse) would undertake different tasks and activities compared to nurses on other pay bands. The type of activities and tasks undertaken by nurses on different pay band will also be determined locally. However, the committee agreed, that more experienced and skilled nurses would likely be paid on higher bands, and thus more productive if they undertook similar activities and tasks. In conclusion, there the committee agreed that there was likely to be some positive relationship between pay bands and productivity of nurses and therefore skill mix and outcomes. However, the committee, were unable to determine which factor (skill mix of the nursing staff or the total staffing numbers) would be the most important contributor to changes in outcomes using the economic analysis results.

The committee also requested further clarification and amendments to explore the consequences of a weaker relationship between nurse pay and productivity – The amendments to the economic analysis report were undertaken and circulated to the committee in late December, for discussion at their final meeting in February 2015 (after the draft guideline consultation period has closed).

The committee agreed that given the limitations of the evidence, the results of studies included in the evidence reviews and the economic analysis alone could be misleading, and should be treated with caution. Thus, the committee used its knowledge and experience to list the factors that should be considered when determining the number of A&E nursing staff needed (see box 2 of the guideline).

**Total nursing hours**

The committee discussed the importance of using nursing hours required rather than the total number of patients. This is because the total number of patients does not accurately reflect the time spent on nursing activities, for example for patients with high dependency and acuity, the level of care provided is likely to be high and require increased nursing time. In addition, the number of patients does not take into account patients who have a long length

of stay. Therefore, it was agreed that total nursing hours should be used for all staffing calculations.

**Issues with current practice**

The committee discussed how staffing requirements are currently carried out and highlighted that staffing to the average patient attendance and profile was not adequate to meet demands. Specifically, staffing levels may not meet demand approximately half of the time. This issue is exacerbated by the lack of flexibility available for A&E departments, as using staff from other departments may not be appropriate as specific skills are required. The committee highlighted that it would be important to take this into account when calculating staffing requirement.

**Methods/approach to determine staffing requirement**

Although no evidence was identified that assessed the use, reliability and validity of any specific toolkits, the committee discussed the BEST tool. This tool is often used in practice to determine nursing staff levels in A&E settings. However, the committee acknowledged that there was no evidence identified to show that the use of BEST leads to an improvement in the safety or quality of care that is provided by nurses in A&E. Therefore, the committee did not explicitly recommend the use of BEST.

The committee also discussed that systematic processes should be used to help inform decisions about the number and skill mix of nurses and healthcare assistants needed. The committee acknowledged that there is a compromise between objectivity of systematic approaches compared to the subjectivity of professional judgement and agreed that it would be inappropriate to rely on professional judgement alone or decision support toolkits alone. The committee discussed the time taken for senior nurses to use a systematic process and agreed that additional training and time would be needed to use a systematic approach. Therefore, the committee agreed that it should recommend use of a systematic process that could be automated by a toolkit, and that the results of these approaches should be checked using professional judgment.

One UK based study found the Jones Dependency Tool (JDT) was reliable for assessing patient dependency and could be used for calculating nursing workload in A&E. The committee agreed that this tool assessed patient dependency (including additional nursing needs for people with additional needs such as people with mental health problems) and was a good indicator of actual nursing hours required. It was also agreed that the Jones Dependency Tool was currently in use across A&E departments in the UK to determine nursing workload. The committee agreed that this tool was an example of a validated patient dependency tool that could be used to assess patient factors when determining nursing requirements.

**Calculation for nursing staff requirement**

The details of the calculation that should be carried out to determine staff requirement were also discussed. Specifically, the need for historical data to predict the likely nursing hours for the subsequent 6 months was discussed. It was agreed that nursing care tasks and the associated time to carry out these tasks as well as patient, environmental and staffing factors would impact on average weekly nursing workload.

In order to address the drawbacks of staffing to the average patient attendance and profile, it was agreed that staffing levels should be above the average and ideally should be up to 2 standard deviations higher than the anticipated average daily demand to ensure that adequate staff are in place to deliver safe care. The committee were cautious about the implication of this recommendation, and recognised that this might result in persistent overstaffing if variation in daily attendances was large. For this reason the committee used daily averages on similar days, or the same day in previous years, rather than weekly averages to minimise the amount of variation and calculate staffing requirements that can be easily implemented.

The group agreed that the calculated staff requirement should be compared to minimum staffing ratios using professional judgement to ensure that these can be met and are appropriate.

**Staffing ratios**

The committee discussed that in clinical practice, general staffing ratios were often implemented in specific departments within A&E settings. In particular there was agreement that due to the high level of dependency and acuity, patient in major trauma and cardiac arrest would require a minimum of 2 registered nurses to provide care for each individual patient. Similarly, it was agreed that priority ambulance calls (which includes resuscitation) would require one registered nurse providing care for each individual patient. The committee also raised that families receiving life changing news would also require one to one care from a registered nurse and this should be included as part of the total nursing care requirement. The group also agreed that use of minimum ratios for registered nurse to cubicles would be appropriate. Specifically, 1 registered nurse to 1 cubicle in triage, 1 registered nurse to 4 cubicles in minors and majors and 1 registered nurse to 2 cubicles in the resuscitation area were agreed as the minimum staffing requirements. Overall, it was agreed that these ratios should be used as a minimum to ensure that staff from other areas were not used to cover these situations as this would have a knock on effect on other areas. However, it was also acknowledged that these ratios are not fixed as additional staff may be needed for example more than 2 nurses may be required for one patient undergoing resuscitation and these nurses will work in other areas when they are not required in resuscitation. The group also strongly supported a separate recommendation for the use of at least one band 7 registered nurse on each shift. It was agreed that this role provided leadership on the wards and in the

committee's experience was associated with higher levels of safe care.

**Patient factors**

The committee discussed patient factors that may be important when determining staffing levels. The evidence showed that as nursing workload increases, nurses spend the longest amount of time providing indirect patient care. The committee questioned the definitions of direct and indirect care and whether these activities would be related to nurse productivity in practice. The committee agreed that in clinical practice there are no established standards or guidelines for the proportion of nursing time that is spent on activities to provide patient care. The committee agreed that patients who have more needs (or higher dependency on others) would require more nursing time. The group discussed the Jones Dependency Tool which is used to determine patient dependency and agreed that this tool was appropriate for use within A&E. In addition to patient dependency the committee also recognised that patient demographics, for example the provision of additional support to patients whose first language is not English, would impact on staffing requirements. Specifically, the timely access and use of translators in A&E settings may impact on nursing requirements. The committee also discussed patient acuity and the nursing activities associated with different levels of acuity. The group differentiated between nursing activities required to address acute care needs that are immediate and need to be carried out in the A&E compared with needs that are ongoing and normally addressed when patients are admitted onto wards for longer-term care. It was agreed that while the A&E department is crowded (for example when there are problems with discharge and transfers to appropriate wards), A&E nursing staff are required to provide both immediate and longer term care. In addition, the committee discussed other factors such as the casemix of patients (for example the proportion of patients with high dependency and acuity would have an important impact on nursing staff requirements) who attend A&E and the amount of patient support provided.

**Environmental factors**

There was no evidence identified for environmental factors. The committee discussed that the location of other related units (for example diagnostic imaging) or inpatient wards were important in determining nursing staff requirements. This is because transfers are usually carried out by nursing staff and the time taken to physically transfer patients to units that are located further away from A&E results in less nursing time spent in A&E settings. It was also recognised that transferring patients to another hospital often has a bigger impact on staffing compared with transfers within the same hospital. For example, nursing support may be needed to undertake external transfers and this would significantly reduce the nursing time spent on A&E. The group also discussed the availability of other neighbouring services and the impact this may have on staffing needs. Specifically, the existence of mental health services or places of safety close to A&E may have a large impact

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| | on both the casemix of patients attending A&E and staffing requirements (for example nurses with experience in mental health settings). The committee also discussed the layout of A&E and agreed that this may also impact on nursing workload for example if there were several side rooms and patients cannot be directly observed from these rooms. Finally, the group also discussed the importance of planned events (for example new year, marathons and music festivals). It was noted that people attending these events will have different demographics but will impact on staffing requirements. For instance some A&E departments may cancel annual leave to ensure adequate nursing staff during planned events. Similarly, the group discussed seasonal variation and agreed that this would also impact on staffing needs if for example higher proportions of older adults attend A&E during the winter months.<br><br>**Staffing factors**<br>The evidence showed that the introduction of a psychiatric nurse was associated with appropriate referral but had no impact on other outcomes. The committee discussed this study and questioned whether the mental health nurse was part of the A&E nursing establishment. It was agreed that in practice, nurses with specialist skills (for example nurses with experience in mental health or paediatric settings) are often needed in A&E settings due to the wide ranging demographics of attending patients. When these staff are not available within the A&E nursing establishment, access to specialist input would need to take place through an alternative route. The committee agreed that the proportion of staff with specialist skills would be an important factor to consider when determining staffing need. A further study showed that staff absenteeism was increased when fewer nurses were scheduled for a shift. The committee discussed this study and noted that absenteeism may be related to increased stress and workload. The group also discussed that the amount of nursing activities other than direct patient can also have an important impact on determining nursing need. Specifically, it was agreed that transferring patients, communicating with relatives and carers and providing training and mentoring for student nurses would all require nursing time. |
| **Summary of link to recommendation area** | **Setting the A&E department nursing staff requirements (recommendations 1.2.1 to 1.2.7)**<br>• No evidence was identified that assessed the use, reliability and validity of any specific toolkits to calculate staffing requirements. However, one UK based study found the Jones Dependency Tool was reliable for assessing patient dependency.<br><br>• The committee made a specific recommendation for the use of a systematic approach as it was agreed that this would be an appropriate trade-off between subjective bias and the consistency and validity of a systematic approach. The key steps for determining staffing requirements were agreed and this included increasing the weekly average number of |

nursing hours to ensure enough staff to deliver safe care. It was also agreed that any calculations should be checked using professional judgement and be compared against minimum staffing ratios for specific areas where patient acuity and dependency are particularly high.

- The committee agreed the recommendations would have a small additional cost and implementation impact for larger A&E departments, however it acknowledged that staffing costs may be substantially increase in smaller units. The use of a systematic approach would have a small additional cost due to additional training and time needed to use any toolkit.

**Box 1 factors to consider when determining A&E nursing staff requirements**

**Patient factors**

- Overall, one included study for patient factors showed that as nursing workload increases, nurses spend the longest amount of time providing indirect patient care.
- The committee made specific reference to patient factors that are likely to result in increased nursing time. For example, higher patient acuity and dependency may result in increased numbers and longer duration of activities that are required to provide safe care.

**Environmental factors**

- No evidence was identified for environmental factors.
- The committee made specific reference to environmental factors that are likely to result in increased nursing time or increased demand. For example, transfers to other units that are located further away from the A&E department would result in increased nursing time. Similarly, during winter there may be increased demand for services from older adults.

**Staffing factors**

- Overall, two studies were included; one showed that the introduction of a specialist psychiatric nurse was associated with more appropriate referrals but had no impact on other outcomes. The other study found staff absenteeism was higher when fewer nurses were scheduled for a shift. These findings were likely to be confounded by stress and workload.
- The committee made specific reference to staffing factors that are likely to result in increased nursing time. For example training and mentoring student nurses require additional time during shifts.

# 3 Assessing differences in the number and skill mix of A&E nursing staff needed and number of A&E nursing staff available (recommendations 1.3.1 – 1.3.7) and Monitor and evaluate A&E nursing staff establishments (recommendations 1.4.1 – 1.4.3)

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| **Recommendations** | **Assessing differences in the number and skill mix of A&E nursing staff needed and number of A&E nursing staff available**<br>1.3.1 At the beginning of every shift assess differences between the A&E nursing staff needed for that shift and the following shift, and the number of staff available. This assessment could be facilitated by using an evidence-based toolkit endorsed by NICE. Take into account the patient, staffing and environmental factors outlined in box 1.<br>1.3.2 Use professional judgement when assessing the differences between A&E nursing staff requirements and the number of staff available.<br>1.3.3 Assess differences between the A&E nursing staff needed and the number of staff available during a shift when:<br>• there is unexpected variation in demand for A&E services or nursing needs<br>• there is unplanned staff absence<br>• patients are spending longer than needed in the A&E department (often because of departmental crowding)<br>• patients need extra support, specialist input or continuous nursing<br>• a nursing red flag event has occurred (see recommendation 1.3.5).<br>1.3.4 Follow escalation plans if the number of A&E nursing staff available is different from the number of staff needed. Action could include:<br>• moving patients out of the A&E department to an appropriate alternative location<br>• delegating activities to suitably trained and competent staff<br>• sourcing extra staff (for example, by allocating extra on-call or temporary staff).<br>1.3.5 Throughout each shift, monitor reported nursing red flag events shown in box 3. Monitor other events as agreed locally.<br>1.3.6 If a nursing red flag event is reported this should prompt an immediate escalation response by the registered nurse in charge of the shift. An appropriate response may to allocate additional nursing staff to the department.<br>1.3.7 Keep records of: |

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| | • differences between the number of A&E nursing staff needed and the number of staff available for each shift<br>• nursing red flag events reported and actions taken.<br>Use these records to inform planning of the future A&E nursing staff establishment.<br><br>**Monitor and evaluate A&E nursing staff establishments**<br>1.4.1 Monitor whether the A&E nursing staff establishment adequately meets patients' nursing needs using the safe nursing indicators in box 4. Consider continuous data collection of these safe nursing indicators (using data already routinely collected locally where available) and regularly analyse the results. See section 8 for more information on safe nursing indicators.<br>1.4.2 Compare the results of the safe nursing indicators with previous results at least every 6 months.<br>1.4.3 Analyse reported nursing red flag events (see box 3) when undertaking this monitoring and prompt an earlier examination of the adequacy of the A&E nursing staff establishment if this is indicated. |
| **Evidence summary** | The evidence review addressed one review question which explored the association between safe staffing and patient outcomes. 9 studies were included for this review question. Generally, the quality of the included studies was weak with the exception of one relatively strong retrospective observational study (Daniel 2012) which found a weak positive relationship between staffing proportions in the ED and patient satisfaction with nursing care. Overall, the evidence was conflicting at times but tended to show that lower nursing staff levels were associated with poor outcomes, these are summarised below;<br>• lower nursing staff was also associated with higher numbers of patients leaving without being seen and increased emergency department care time.<br>• there was conflicting evidence for the association between nursing staff levels and patient waiting times and time to antibiotics<br>• no association was found between staffing levels and medication errors or rate of aspirin administration following a cardiac event<br><br>No economic studies were identified. The de novo economic analysis developed for this guideline showed that:<br>• Low nursing skill mix and low staff numbers will have a negative impact on outcomes (more patients leaving without being seen, higher average duration in A&E departments and higher occupancy).<br>• There was no association trend between low nursing skill mix and low staff numbers with death, and a weak trend for patient leaving without being seen. |
| **Committee** | **Consideration of the included evidence** |

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| **considerations** | The committee agreed that the included evidence was conflicting but showed a general trend that lower nursing staff levels were associated with poor outcomes. The group discussed these findings with reference to the methodological limitations of evidence (see evidence to recommendations table for setting the A&E nursing staff establishment). It was also noted that there was a lack of evidence for important safety outcomes such as medication errors, death and other serious events.<br><br>**Nursing deficits**<br>The committee discussed that it would be important to identify when the number of A&E nursing staff available is lower than nursing staff requirements. It was agreed that this may happen when there is an unplanned increase in demand for services, staff sickness and crowding in the A&E department. It was also agreed that it would be important to carry out this assessment when safety incidents occur as this may be due to staff shortages.<br><br>The committee also emphasised that escalation plans should be implemented when nursing deficits have been identified (see evidence to recommendations for organisational strategy). It was discussed that these plans could be explored at a local level to facilitate innovative and flexible approaches. However the committee suggested that possible actions included the use of on-call staff, moving patient out of the A&E department and safely delegating activities to other staff with the appropriate skills and experience.<br><br>**Red flags and indicators**<br>The committee agreed that it was important that organisations should be alerted to potential safety issues so that appropriate responses can be actioned. This requires monitoring of events that can alert staff about harm that could be occurring, or is likely to occur because the number of available nursing staff is too low. This requires the use of both red flags which require immediate action if they occur, and indicators of safe staffing that can be monitored over a period of time to check if the planned nursing establishment is sufficient to provide safe care.<br><br>The committee agreed that a list of red flags and indicators should be developed but it was not confident in the findings of the evidence review and noted that some important outcomes were not reported. The evidence from the economic analysis and the knowledge and experience of the committee were also used to inform decision making for red flags and indicators. This information was used to develop a list of red flags (see box 3 in the guideline) and indicators (see box 4 in the guideline).<br><br>Specifically, the results of the economic analysis suggested that spikes in A&E attendance and average duration in A&E departments, showed relatively consistent associations with lower staffing levels and skill mixes. The committee felt that these may be |

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| | good indicators to use. In contrast, the results examining the association between death and staffing levels or skill mix were considered to be inconsistent. This may have been due to the small numbers of reported incidents in the evidence and the included data sources. The committee also highlighted the lack of primary research investigating the association of death with staffing levels or skill mix and therefore agreed that it was not appropriate to use death as an indicator for safe staffing. The committee also considered the outcome of patients leaving without being seen. The economic analysis results did not show a clear trend and were considered to be inconsistent in some scenarios, however, the evidence from primary studies and the overall results demonstrated that lower skill mixes and staffing levels were associated with more patients leaving without being seen. Therefore, the committee felt that patients leaving without being seen would be an appropriate indicator for safe staffing.<br><br>When red flags have taken place, the committee agreed that the numbers of nursing staff available, the red flags and the response should be recorded so that they can be used for future planning, alongside regular reviewing of safe nursing staffing indicators.<br><br>**Monitor and evaluate A&E nursing staff establishments**<br>The committee discussed monitoring of A&E nursing establishments and agreed that these should be regular enough to identify potential problems. The committee acknowledged the small added administrative burden associated with monitoring and evaluation (of red flags and indicators) but felt it was necessary to prevent safety incidents in the future and could potentially be cost-saving in the long run. Overall, it was agreed that 6 monthly monitoring would be the minimum required but more regular monitoring may be carried out. |
| **Summary of link to recommendation area** | **Assessing differences in the numbers and skill mix of A&E nursing staff needed and number of A&E nursing staff available (recommendations 1.3.1 to 1.3.7)**<br>• The evidence was conflicting at times but tended to show that lower nursing staff levels were associated with poor outcomes such as leaving without being seen. It is noted that there was no significant association with some clinical outcomes such as medication errors.<br>• The committee made specific recommendations on assessing nurse deficits using professional judgement and emphasised the importance of implementing possible actions as part of the escalation plan to prevent unsafe care. The use of a decision support toolkit endorsed by NICE was specifically recommended to facilitate this assessment.<br>• The committee acknowledged the small added administrative burden associated with red flag recording but felt it was necessary to prevent safety incidents in the future.<br>**Monitor and evaluate A&E nursing staff establishments** |

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| | **(recommendations 1.4.1 to 1.4.3)**<br>• The committee made a specific recommendation to compare safe nursing indicators with previous results at least 6 monthly to ensure safe care is being delivered<br><br>**Box 3 Nursing red flag events**<br>• The committee specifically referenced 7 red flags which should prompt immediate review of staffing levels. These were agreed based on trends from the evidence review and health economic modelling and the knowledge and experience of the committee<br><br>**Box 4 A&E Safe nursing indicators**<br>• The committee specifically referenced safe nursing indicators for patient experience, clinical quality, staff reported and staff establishment which should be monitored longer term to monitor potential issues with staffing levels. These were agreed based on trends from the evidence review and health economic modelling and the knowledge and experience of the committee |