

## Flexible nurse staffing in hospital wards: the effects on costs and patient outcomes

With nursing shortages and pressure to increase efficiency, hospital managers still need to ensure safe staffing levels in hospital wards. This means that resorting to flexible staffing resources is often necessary and could be beneficial. These resources can include agency nurses, overtime or the establishment of float teams to meet varying demand. However, there is uncertainty about the impacts for patients and organisational outcomes such as costs. This brief reports on evidence of the effect of flexible staffing.

### What is the problem?

Nurse staffing levels and skill mix are associated with the quality and safety of care in hospital wards. But in common with other healthcare systems, the NHS is facing increasing nursing shortages; a recent report highlighted that demand for nurses still exceeds supply, with an overall 6.5% vacancy rate across England [1]. At the same time, there is rising demand for healthcare with limited resources.

Establishing the most efficient approach to matching limited nursing resources to the often variable demand for care on hospital wards is an important priority. Flexible staffing policies have the potential to ensure that nurses are deployed to wards where the demand is greatest, avoiding the negative consequences for patients when staffing falls below the required level [2].

However, some flexible staffing approaches, such as use of agency staff, can represent an expensive solution for the NHS and, as a result, trusts are looking at options to reduce their temporary staffing costs [3]. Furthermore, there are some safety concerns related to the use of temporary staff, such as potential for less familiarity with ward practices and disruptions to continuity of care and team communication [4]. But use of external agency staff is not the only approach to flexible staffing and many hospitals 'float' nurses between wards to cover staffing shortfalls. This review aims to give an overview of evidence relating to how patient outcomes and organisational costs are affected by multiple aspects of flexible staffing including:

- Temporary staffing (agency, bank)
- Overtime
- "Floating"

The concept of "temporary staffing" has been used as an umbrella term for deployment of staff who are not permanently employed by the organisation. However, in the UK a hospital's own employees may be hired as temporary staff though an agency and employees of one unit may undertake extra work and be temporarily deployed to their own or another unit via a hospital's own 'bank', or may work exclusively as part of the bank with no permanent unit assignment. Thus, there is potential overlap between 'temporary staffing', 'overtime' and 'floating'. We have organised material by the primary focus.

### Data sources

We searched MEDLINE, CINAHL, PsycINFO, SCOPUS, & the Cochrane Library using terms such as "temporary / agency / bank/ supplemental", "float pool" linked with terms such as "safety", "error", "satisfaction", "costs", "mortality", "performance", "efficiency". We identified a moderate number of studies. Most studies were cross-sectional, and we selected two reviews focussing on float pools and temporary staffing in nursing as core sources [5, 6].

### Temporary staffing

The evidence around temporary staffing is largely from the US, with only two studies from the UK. Three large US studies report that higher use of temporary staff does not affect mortality [5] and higher levels of non-permanent staff are associated with lower levels of adverse events [4], fewer medication errors [7]. A single small UK study found lower occurrence of DVT & pressure ulcers was associated with higher levels of temporary staffing [8]. Other studies found no significant differences in quality outcomes when more temporary staff are deployed [9-11]. These findings suggest that the priority for patient safety is to maintain sufficiently high staffing levels. However, some findings indicate the opposite, so that increased use of temporary staffing is associated with increased patient falls with injury [12] and shortcomings in quality of care [13].

Studies from the UK and US highlighted that wards with more temporary staff are more expensive to run than wards with solely permanent nurses [14, 15], although one US study suggests that a modest use of supplemental nurses (average 0-0.2 Nursing Hours Per Patient day) was associated with slightly reduced total staffing costs [16].

### Overtime

There is evidence that increased use of overtime by nurses, that is time worked beyond the contracted hours for the shift and/or work week is, is associated with adverse outcomes. A large US study found that every additional 10 percent of overtime hours was associated with a 1.3 percent increase in hospital related mortality [17]. A further study found that needlestick injuries, work-related injuries, patients falls with injury, nosocomial infections, and medication errors were significantly related to nurses working more than 40 hours in the average week [18]. The negative effect of overtime

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appears to be independent of the length of shift that is worked [19].

## Floating

“Floating” refers to the practice of “assigning nurses to nursing units other than those they are regularly assigned to work”, sometimes drawing from a defined pool of nurses [17]. There are different ways in which float pools are organised and structured within hospitals (e.g. unrestricted unit floating vs clustered unit floating). The evidence about this practice is contrasting, and this may be due to the inability of some studies to disentangle float pool from other aspects of temporary staffing. The limited economic evidence on float pools suggests they are associated with a decrease in agency related costs and in vacancy rates [20] but there is some evidence that patients who are frequently cared for by a float nurse are at higher risk of bloodstream infections [17].

A number of modelling studies have tried to develop solutions to produce schedules that make the most efficient use of the available resources at a hospital-wide level. However, these give contrasting results. For example, one model explored the potential of employing float nurses to dynamically respond to the hospital’s fluctuating patient population and concluded it was beneficial [21]. However, another modelling study concluded that effectiveness of care is potentially jeopardised when allowing nurses to float between different wards with clear trade-offs between efficiency and effectiveness [22]. Both unconditional use of floating and a no tolerance policy led to sub optimal outcomes. A small pool of floating staff was recommended.

An extensive but dated review concluded that if floating is mandatory for nurses, they should be competent and skilled, and floated to similar clinical areas to the ones where they usually practice [6]. Cross training refers to a specific training to enable nurses to cover other units. Limited evidence indicates positive outcomes from cross training, such as reduction in overtime and use of agency nurses [23, 24].

## Conclusions

Flexible staffing can be implemented in several different ways. The evidence we have identified makes it clear that implementing flexible staffing requires a careful balance of the potential risks and benefits of different practices. Most of the available evidence comes from cross-sectional studies, which make determining cause and effect difficult. Furthermore, little evidence emanates from the UK.

Much of the available evidence relates to the effect of temporary staffing. Because the evidence is mixed, it would be wrong to make a firm conclusion about any effects of temporary staffing. However, while some studies suggest that there may be risks to patient safety, other studies imply that resource adequacy is the deeper underlying problem and that temporary nurses may compensate for nurse staffing deficiencies, albeit with a risk of reduced effectiveness and higher costs.

Float pools have been credited with decreases in overtime and reduced use of expensive agency staff, but the evidence around this practice’s outcomes is mixed. Limited use of float staff who are properly prepared seems more likely to succeed

than ad-hoc redeployment of staff. Some approaches to roster planning for flexible staffing have been proposed in modelling studies. However, none of these models has been tested and implemented routinely yet.

More detailed scrutiny of the limited but complex evidence is warranted, but the absence of evidence from the UK suggests more primary research is required.

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