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Conference Report

Safe Staffing in the Post Anaesthetic Care Unit: No Magic Formula

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REPORT FROM BARNA TALKS: STAFFING IN PACU, LONDON, 7TH NOVEMBER 2009

Staffing the post anaesthetic care unit (PACU) has for years remained one of the most intractable problems faced by PACU managers both in UK and abroad. Patient throughput in PACU is erratic, numbers and acuity are constantly changing, delays in admission and discharge result in traffic jams within the PACU. Each patient undergoes dynamic clinical change as they recover from the effects of anaesthesia and surgery. Adverse critical events can affect the 'simple' cases as well as the acute, high-risk patient. PACU staff must be flexible, ready for rapid redeployment as the numbers and clinical priorities change, and change again. How can the PACU manager ensure that at all times of the day, staffing levels and skills meet these challenges in order to ensure the safety and comfort of each patient?

Interest in finding a solution to these problems has long been expressed by PACU nurses both at home and abroad. The American Society of Peri-Anesthesia Nursing (ASPAN) Delphi Study cites staffing as a major priority for further research [Mamaril, 2009] while information about staffing is a regular request from British Anaesthetic and Recovery Nurses Association (BARNA) members. PACU managers need authoritative evidence about staffing to support their case for safer staffing ratios when negotiating with hospital management.

The lack of substantial evidence around this important problem certainly requires resolution. Within the quality agenda (standard setting: audit) there are published minimal safe staffing ratios for PACU including those from BARNA and ASPAN. However, evidence from published research and audit about safe staffing remains insubstantial. In the USA, recognition of this fact has prompted ASPAN in 2006 to initiate a Safe Staffing Strategic Work Team to conduct research into evidence available around this topic. Of 75 potential journal articles, only 3 studies related specifically to staffing in PACU. ASPAN has urged members to instigate research and audit into this topic.

To analyse the problems inherent in staffing the PACU and attempt to provide some workable solutions for managers, BARNA held the 'BARNA Talks' Symposium in November at the Thistle Hotel, London for both members and non-members. Participants were grouped and timed discussion around 6 groups of themed questions about staffing ensued. Discussion on each theme was timed and groups fed back to the whole assembly. Evidence to support discussion and to provide participants with knowledge about this topic was given at each stage. This presentation will examine the content discussed at this event following the themes put to the participants.

THEME 1: WHAT ARE THE MINIMUM SAFE STANDARDS FOR STAFFING PACU?

This was the first theme put to the participants who were asked specifically if they used national standards

for safe minimal staffing numbers to plan PACU staffing schedules. Published minimal safe staffing standards from the Royal College of Anaesthetists (RCOA), ASPAN and BARNA were given to each group to compare and discuss.

It was generally agreed that a recognised and authoritative, safe minimal standard of staffing is essential as a benchmark on which to compare current local performance and plan staff scheduling. As a start point for work force negotiation with hospital management the use of a standard is essential. Quite a few of the participants reported use of the RCOA staffing standard on the grounds that it is the most authoritative. It was generally agreed that the BARNA standard on minimal safe staffing levels could be reformulated after benchmarking the best content of all three standards. Terri Clifford, ASPAN President, when consulted about the latest ideas on staffing from the USA, confirmed that the ASPAN standard statement has provided quality care over the years and was the keystone to safe staffing in the USA.

THEME 2: IS STAFFING SUFFICIENT IN YOUR UNIT TO MATCH THE MINIMAL STANDARD OF SAFETY?

Specifically, the groups were asked whether staffing in their units was sufficient to cover peak activity and whether there were routine delays in admission and discharge from PACU. Overall participants agreed that enough staff were available to cope with the peak activity, which is very often in late morning and afternoon, as theatres wind up and patients still have not been returned to the wards. Staggering the shifts was reported to be the most effective way of covering these periods.

Probably the richest source of specialist PACU staffing evidence is to be found in the articles written by American anaesthesiologists. Staffing PACU is the most expensive part of anaesthesia costs and there is a need to match nurses to bed space with maximum efficiency. The need to drive services, avoid delays and extra costs, of course galvanises the US health care private health care system. Dexter *et al*. [2005] write that delay of one patient into PACU over one day represents insufficient staffing. Surgical scheduling, nurse scheduling and patient discharge are all key-factors in determining whether PACU staffing will match patient throughput and each presents its own problems. Surgical sequencing and delays in discharge are important factors outside the PACU manager's direct control and will be considered first.

Surgical scheduling

The day-to-day variability in timing of admissions from theatre is cited by Macirio *et al.* [1999], as a major determinant of PACU productivity. Dexter *et al.* [2005] reinforces the point that the order of surgical patients can maximise PACU efficiency. Optimising sequencing of cases to ensure a smooth, steady flow of admissions is not always easy. Many scheduling models exist: some advocate putting large cases first on the list, some last. Historically, surgeons do not want to lose control over their lists and it may be difficult for the PACU manager to influence scheduling. If surgical list sequencing could be better planned to space the heavier cases to PACU more evenly through the day, the PACU manager would be well advised to gather evidence to highlight current problems. An audit to plot the impact of individual and multiple list design impact on PACU staffing ratios would present specific information on which to base further discussion and negotiation.

Discharge: Is it speedy?

There is some contention among authors as to how important delayed discharge is in overstretching PACU staffing due to back up of patients. Tessler *et al*. [1999] assessed patient flow to see if patient were discharged when ready. Results showed that 76% of 336 patients assessed experienced delayed discharge from PACU. Five main causes contributed to this – orderly busy (41%): patient awaiting anaesthetic assessment (36%): PACU nurse busy (15%): ward not ready (6%): patient awaiting X-ray (2%). The system errors that delay patient discharge are well known to all PACU practitioners: in the UK lack of efficient portering is often a major element. Tessler *et al.* [1999] maintained that patient load (or overload) in PACU is due not primarily to admission factors but delayed discharge.

As with surgical sequencing, the PACU manager would be advised to consider discharge delay as a possible contributing factor in analysis of staffing problems. As above, audit is essential if hard data are to be used as proof of the nature and breadth of the problem. A simple audit tracking the time and cause of delays will soon pinpoint weak organisational areas. Both surgical sequencing and patient discharge to the wards are factors not directly controlled by the PACU manager. Change in both these areas must be effected by collaboration with all interested parties (surgeons and ward nurses alike).

THEME 3: HOW DOES YOUR MANAGER PLAN STAFFING IN PACU?

Nurse scheduling is key to the provision of safe nurse–patient ratios in the PACU. The groups were asked how far in advance off duty nursing schedules are drawn up prior to any given operational day: one month, one week, the day before or on the day itself. They are also asked whether their decisions taken by their managers about staffing were informed by expert opinion alone (i.e. managers experience) by audit or with the use of a statistical workforce-planning tool.

Overall the participants replied that managers used expert opinion to plan staff ratios a month ahead, but that routinely changes were made either the day before or on the day in question. To ensure the most flexible use of staff would necessitate completing the off duty on each day following publication of the surgical lists to ensure the best match to the day's activity. However, Macirio *et al*. [1999] pointed out that staff morale suffers if too many last minute demands are made on them. It would appear from empiric evidence that a long-term off duty with provision for daily adjustments would provide the best solution.

Expert opinion, used for years by experienced PACU managers to juggle staff numbers and skills to patient throughput and acuity on a daily basis, has long been the only means of ensuring safe staffing. Only the manager knows exactly how her/his staff perform, whether they need supervision, what patients they are competent to care for, etc. Only the manager holds in her head exactly how skilled and careful are the surgeons/anaesthetists performing on any given day and what potential problems she may have to deal with. However, the requirement for expert opinion to be underpinned by statistical evidence is increasingly acknowledged both in the UK and USA. In the UK workforce planning has gathered momentum as part of the government's quality agenda. Incorporating hard evidence requires education in the use of workforce planning tools and statistical packages to calculate staffing numbers along mathematical lines. The current culture of quality within the National Health Service (NHS) agenda increasingly expects managers to make strategic long-term plans around staffing, to carry out audit routinely, work alongside senior managers and use statistics to inform staff management. The difficulty of staff scheduling in PACU is more complex than that of a ward, with more stable patient populations.

Workforce planning methods	Characteristics
Professional judgement method	• *Convert duty rotas into whole time equivalents* • Quick, simple to use/apply to any speciality • Good springboard for more sophisticated analysis • But relationship between staffing levels and quality hard to explain • May be too subjective
Nurses per occupied bed method	• *Average nurses per occupied bed* • Simple, popular, quick to evaluate number and mix of staff • Determining ward's grade mix easy as formulas broken down by nursing grade • But insensitive to patient acuity
Acuity-Quality method (dependency-activity-quality)	• *Dependency-activity-quality method* • Useful where patient numbers/mix fluctuate • Provide floor below which nursing care standards should not fall • Formulas more complex to apply • Useful to apply to PACU where patient numbers and acuity fluctuate • Nursing benchmarks/performance indicators a natural spin off from this method
Timed-task/activity method	• *Measures type and frequency of nursing interventions awarding nursing minutes to reveal total number of nursing hours needed* • Suitable where nursing needs can be confidently predicted • Most expensive of all methods
Regression analysis method	• *Predict the required number of nurses for a given level of activity (predictor is independent variable and number of staff is dependent variable)* • Requires complex statistical analysis • Independent variables include number of theatre sessions and day surgery cases (number of nurses required rises as lists longer) • Suitable for situations where predications are possible

What kind of statistical tool could help the harassed PACU nurse manager maximise use of staff? US literature reveals complex, time-consuming models that require a good deal of expertise in the use of statistics and information technology (IT). Dexter *et al*. [2005] offer a bewildering statistical staffing solution

scenario: ten PACU nurses working daily in overlapping 8–10 hours shifts: making a total of 577 billion scheduling solutions! Waters and Andalo [2003] see the necessity of staffing solutions that need to be practical, accessible and seen to make a positive difference. Only by working at this level will staff become confident and knowledgeable and buy into the use of tools/statistical packages.

The Department of Health commissioned the Nuffield Institute at Leeds University in 2002 to undertake a literature review of the five commonly used work force tools (see table on previous page). Dr Keith Hurst led the project and rated the Acuity–Quality method as the best formula because it takes into account all three factors: dependency, activity and quality.

Although the above tools are useful, it should be noted here that there is no magic nurse workforce staffing formula for any speciality least of all the PACU. The many variables that impact on staffing make that impossible. The development of workforce planning tools specific to PACU staffing requires a good deal of investment and expert advice from statisticians. Hurst [2003, p. 17] states 'I think the days are now over where nurses can use professional judgement as a solitary tool. But it still has a life if it is used in tandem with another workforce planning method'.

For the PACU manager rigorous auditing of those known variables that affect staffing in PACU may optimise the use of staff in PACU. Routine audits on discharge, surgical scheduling, match of staff numbers to patient throughout will undoubtedly inform staff planning. Dexter *et al.* [2005] advised that audit of staffing over a specific period of time such as four months. He reports a marked improvement of performance by increasing the period of audit. Another valuable point he makes is that audit should be ongoing and routine. Setting up documentation and IT systems, which constantly monitor variables can only lead to constant service improvement and PACU manager's would be well advised to seek help in implementing these changes.

THEME 4: HOW DOES PATIENT ACUITY AND ADVERSE EVENTS EFFECT STAFF–PATIENT RATIOS?

Participants were asked if they were always staffed adequately to cover predicted complex cases. Specifically whether they witnessed adverse events routinely and how often they had to deal with acute events necessitating resuscitation. Finally, what effect did the above have on their staff–patient ratios and workload. Overall the group reported that while complications, both simple to complex occurred routinely, there were sufficient nurses to manage these situations.

Cohen *et al.* [1999] studied nursing workload associated with adverse effects in PACU and found that a higher number of adverse events required higher numbers of PACU staff. Kiekkas *et al.* [2005] stated that patients with high acuity need more nurses. Although the ASPAN standard integrates patient acuity into staffing ratios it is clear that there is not enough routine integration of patient acuity and adverse events factored into staffing analysis. However, adverse events can totally destabilise staff–patient ratios and skill mix. It would appear that the lead on acquiring routine sophisticated qualitative data on patient progress and outcomes during the perioperative pathway should be taken by the anaesthetists. PACU is the end part of the perioperative pathway and the role of the PACU nurse is 'in loco anaesthetist'. Assessing patient dependency on an ongoing basis could inform staff scheduling in the PACU. O'Brien and Benger [2007] report on the use of the Jones dependency model for use in Accident and Emergency department collecting data to assess the status of dependency of all patients on arrival and at certain points in their care. This sort of model could be adapted to reflect the dependency of the PACU patient even given the rapidly changing clinical status of the post-anaesthetic patient.

Just as the anaesthetic and surgeon risk-assess patients and plan care accordingly, so the PACU nurse performs her/his own patient risk assessment on arrival, considering medical, surgical and anaesthetic history to pre-empt complications. Continuing assessment and skilled intervention ensures an uneventful recovery with minimal discomfort due to pain or post operative nausea and vomiting (PONV) together with the rapid stabilisation of respiratory and cardio-vascular systems. Cohen *et al.* [1999] stated that risk analysis and pre-emptive treatment of PONV and pain ultimately saves on nurse's time. The important point here is that safe staffing solutions depend on nurse's skill and competence – not just on juggling numbers. The more competent the nursing team, the less frequent will be the frequency of adverse events and the time taken to deal with them, all of which impacts on staffing.

Timed task activity audit can be a major informant in staff planning. Kiekkas *et al.* [2005] study found that PACU nurses spent time as follows: 35% on direct care; 11.6% on assessment; 7% on patient communication; 7.2% on other communications; 8.6% on clerical duties; 9.3% on documentation; 2.3% on non nursing duties; and 18.8% on personal activities. He found that when nurse–patient ratios were inappropriate more time was spent on direct care and the other activities fell

off and that nurses reprioritise tasks around patient acuity if time is limited. Nurses instantly respond to situations appropriately. If a critical event occurs – inessentials are put in second priority. The above studies stimulate the question of how precious nurse time can be spared for skilled nurse's work. For example, could clerical support be used for documentation or Health Care Assistants for non-clinical duties to free up nursing time? Again audit is essential if the manager is to consider extending the roles of nonclinical staff in PACU. To have an informed knowledge of just how PACU nurses time is used on a daily basis hugely informs staff scheduling. We all know that PACU nurses enjoy a significant amount of 'down time' when there are no patients in the unit and that time is often wasted. Careful analysis of nurse activity could come up with some useful solutions to staffing problems.

THEME 5: DO PACU STAFF SKILLS ALWAYS MATCH PATIENT ACUITY IN YOUR UNIT?

Participants were asked about the ratio of experienced registered nurses (RN's) to junior staff and whether there were occasions when staffing numbers were satisfactory, but skill mix poor. Did their juniors feel adequately supported and mentored? Were Health Care Assistants employed, and if so, what was their function? Response indicated that staff skill mix was not always satisfactory. In some hospitals Health Care Assistants were used for non-clinical duties.

Rischbieth [2006] highlights the importance of matching nurse skill to patient acuity in intensive care units (ICU) accurately and states that often-staffing allocation decisions were based on insufficient knowledge. Inappropriate allocation together with poor training and inadequate supervision lead to staff tensions and fatigue issues. Although this study focuses on ICU there are many similarities between ICU and PACU, two distinct critical clinical areas. The necessity of considering not just basic qualifications but nurse's experience, ability to work with minimal supervision and familiarity with specific techniques must be considered in staff allocation. The regular use of 'unknown' agency or bank staff exacerbates this problem. However, in ICU, once the nurse has been deployed to one patient, she/he is there for many hours, whereas the PACU nurse is constantly re-deployed. For the PACU manager this makes staff allocation even more difficult as nurses are continually allocated to potentially unstable new admissions.

Iacono [2006] states that PACU staffing needs should not be based solely on daily numbers of anticipated patients but on workload intensity, acuity, nursing experience and competence – all factors must be brought into the equation. PACU is a complex clinical area and evidence fails to capture the fast paced critical care aspect. Competency packages must be in place to ensure all nurses are able to handle the rapid decision making integral to PACU nursing. Routine and constant audit of individual nursing skills is essential to ensure that any given shift employs the appropriate skill mix to care safely for patient acuity on each surgical list. One senior manager reported how she simply graded each of her PACU staff: as 1 (most experienced); 2 (moderate experienced); and 3 (least experienced) according to their PACU training and experience. Each day she would ensure a differing ratio of 1:2:3 according to the acuity of patients on the lists.

THEME 6: HOW DO YOU FEEL ABOUT YOUR JOB?

Participants were asked how satisfied they were with their job. Were they happy and confident at work or feeling insecure, burnt out or exhausted? If so, were any of these problems due to staffing? Participants overall felt secure and content in their work, while acknowledging that the PACU environment can, at times, be stressful.

There is increasing interest not only in auditing patient satisfaction, but also in finding out how nurses feel about their roles. Nursing Index Studies attempt to measure nursing environment factors that lead to level of job satisfaction. In an increasingly smaller pool of nurses this is crucial if we are to recruit and retain nurses into PACU. In the UK general nursing studies have shown a significant relationship between nurse–patient ratios and emotional exhaustion [Sheward *et al.*, 2005]. Undoubtedly, persistent understaffing will demoralise and exhaust staff as they are constantly asked to plug the gaps. The answer to a continual understaffing problem, however, is not just about finding more staff to cover peak times. Any manager must ask herself why staff either do not want to work in PACU or do not wish to stay. Building common awareness and ownership for staffing and offering incentives such as flexible hours and pay back system for staff overtime are important solutions. Any staffing system must be seen to be fair and transparent. Building a dynamic learning environment where all staff are supported in their clinical and professional development is enormously important. Support and mentorship

for juniors will develop confidence both in the mentor and student. The end result will be to create a happy work environment in which each team member feels valued. In any PACU unit with periods of inactivity, a poorly led team often has the time to develop factions, which may work against the manager particularly when it comes to staffing. Conversely strong leadership and a tightly knit team will go the extra mile in resolving daily problems that inevitably occur in staffing the PACU.

To summarise it must be said that there are no magic solutions to safe staffing in PACU. Staff scheduling is a multi-faceted problem with many variables. Deciding on a national standard for safe minimal staffing is the first step towards rationalising staffing schedules. Audit of as many variables as impact on staffing is the second major step. Professional expertise would always predominately inform safe staffing, however, this should be underpinned with the introduction of a suitable workforce planning tool to rationalise staff scheduling. Increasingly NHS Quality Commission will look to see managers collaborate to produce long-term, planned solutions. There is no doubt that evidence around PACU safe staffing is insubstantial and much more needs to be done to audit and research this area particularly with regard not only to staffing numbers, but staff skill mix. National Workforce planning initiatives are still generalised to ward populations and do not give sufficient advice about specialist areas such as PACU. The increasing interest in nurse job satisfaction is important to encourage management to build a progressive and above all happy work environment where each nurse achieves their full potential. This can only facilitate staff scheduling. PACU practitioners must work alongside their colleagues, particularly the anaesthetic and surgical teams. PACU nurses care for patients on their behalf; the anaesthetic and surgical teams must also take responsibility for staffing shortages in PACU and seek solutions alongside the PACU management staff.

BARNA: Future staffing strategy

As a result of the meeting it was proposed that BARNA scrutinises the BARNA standard on staffing and revises this document. A national audit on staffing has been designed and circulated to members via e-mail. If you have not yet done so, please complete and return it to patsmedley@hotmail.com. Information on staffing (evidence from literature/audit results) should be available to all PACU nursing staff in the UK via the BARNA website. The results of the audit and further initiatives will be reported back at the next BARNA Conference in Manchester: May 2010.

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