

# Setting the standard: the role of ACORN

## Part II: Counting, the gold standard to prevent the inadvertent retention of surgical items – or is it?

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This is the second paper that presents the results of research about the role and effectiveness of ACORN. The first paper, published in the last edition of the ACORN journal<sup>1</sup>, presented the data about the role of ACORN, which demonstrated the significance of the ACORN standards. The majority of respondents, who were perioperative nurse managers and former or current ACORN Board members, believed the standards had a positive effect on nursing practice and patient outcomes, and were the benchmark for perioperative nursing practice. Although most respondents professed the value of the standards, occasionally their beliefs were tempered by a number of other issues that emerged from the data about standards. The opinions of a minority of respondents contrasted with the beliefs of most of them; however, these 'minority' opinions were revealing, too.

This paper focuses on the results of analysis of the data collected about the ACORN counting standard<sup>2</sup>. These were in Part E of the NUM questionnaire (NUM Q)<sup>3</sup>. This part sought to ascertain if the ACORN counting standard was used to inform counting practices in the respondents' operating suites, and if respondents believed it prevented the inadvertent retention of a surgical item. Also elicited was information on how respondents reported and dealt with cases of incorrect counts and missing surgical items.

### Results

A total of 106 respondents (85.4%) indicated they always based their counting procedures on the ACORN standard, 13 (10.4%) indicated they used this standard sometimes. Three respondents were unsure and two did not answer this question. No-one stated that they never used the ACORN counting standard.

There were 33 comments; some respondents were unequivocal in their comments, namely "Basis of our practice standards" [NUM Q:88]. Other respondents, however, were more ambivalent, for example "Rationalised ACORN standard to meet needs of our department" [NUM Q:76]. Fourteen respondents from NSW (one third) commented that they used TS-10 either alone or in conjunction with the ACORN counting standard. The TS-10 is a NSW Health Department policy about counting<sup>4</sup>. There were various other comments made by the remaining 19 respondents. For example, two stated "tradition or habit" guided practice [NUM Q:4 & 64].

Respondents were asked to indicate if they had experienced any miscounts or incidents of lost items over the preceding year, how many times this occurred and the nature of the items missing. Sixty-seven respondents (54%) reported miscounts ranging from one episode to "10% of cases" [NUM Q:10]. This latter respondent's organisation completed more than 500 cases per month and therefore reported a minimum of 50 miscounts per month or 600 per year, if the 10% estimate was correct. This seems unusually high in comparison to other reports in the literature<sup>5</sup>. Eight respondents reporting an incident gave no number, for example "Very few incidents" [NUM Q:25].

A number noted that their response was an approximation and some respondents gave a range, for example 13-5 [NUM Q:40]. Forty-four respondents (35.4%) claimed they had no miscounts over the last year and three were unsure. Twelve respondents (9.6%) did not answer this question.

Most comments in this section, of which there were 13 (10%), indicated that some miscounts were documentation errors or that their initial miscount, when rechecked, was in fact *not* a miscount or lost item, for example "Needle lost but subsequently found on floor before patient departed theatre" [NUM Q:85]. Some respondents made other comments about the nature of lost items, for example "Micro-needles – usually lost by the surgeon" [NUM Q:108].

In reviewing the incidence of miscounts, the data were examined to see if there was any relationship between nursing staff mix and the number of reported incidents. More public hospital respondents than private hospital respondents, 56% versus 43% approximately, reported employing mostly registered nurses (RNs) in their operating suites, whereas private sector respondents were more likely to employ a mix of both RNs and enrolled nurses (ENs). These data are in Table 1.

The incidence of miscounts by staff mix is documented in Table 2. This table contains the number of incidents respondents claimed had occurred in the preceding year. Note that 20 respondents with a mostly RN staff mix (31.7%) and 24 with an RN/EN staff mix (40%) reported no incidents or miscounts.

A total of 37 of 63 (or 55.2% of operating suites with a mostly RN workforce) reported incidents compared with 30 out of 60 (or 44.8% of operating suites with a RN/EN staff mix). However, a chi square

test revealed the difference was not statistically significant,  $\chi^2 (1, n=190) = 3.841, p.05$

The respondents were also asked to rank a list of items in the order of frequency of loss or miscount. The items most frequently reported lost were needles, followed by gauze swabs, instruments and then sponges. However, the number of needles reported lost was about four times greater than the other three categories of items. Not all respondents completed each category. The results are shown in Table 3.

Respondents dealt with incorrect counts in several ways. These are displayed in Figure 1. Note that 85 respondents (68.5%) indicated they completed more than one of the activities. Completion of an incident form was reported by 116 respondents (93.5%) following miscount; for 35 (28.2%) respondents the miscount was reported via a quality activity, 54 (43.5%) indicated they made a direct entry into the patient's record and 50 (40.3%) reported incidents to their operating room management committee or similar. Twelve

**Table 1. Staff mix in the public versus private sector.**

Type of institution	Mostly RN staff	RN/EN staff mix
Public hospitals (n=79)	44 (55.7%)	35 (44.3%)
Private hospitals (n=44)	19 (43.2%)	25 (56.8%)
Total (n=123)	63 (51.2%)	60 (48.8%)

**Table 2. Number of incidents by staff mix.**

No. incidents reported in preceding year	Operating suites with a mostly RN staff mix (n=37)	Operating suites with an RN/EN staff mix (n=30)
1 incident	6	9
2 incidents	3	8
3-5 incidents	10	5
6-10 incidents	4	3
12-60+ incidents	9	2
Unknown number incidents	5	3
Total	37 (55.2%)	30 (44.8%)

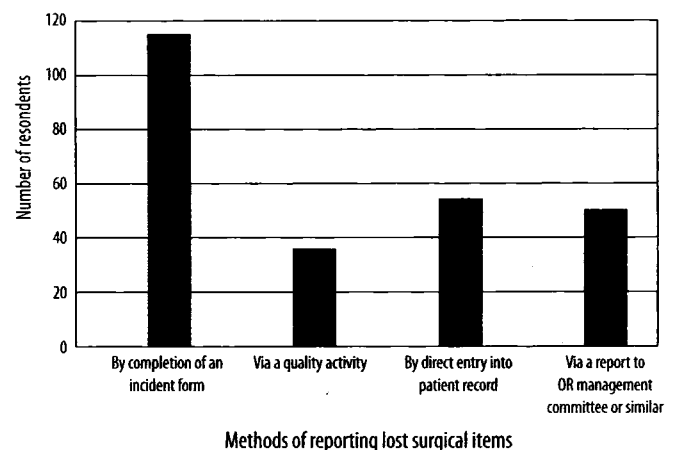
**Table 3. Ranking of items reported missing.**

Item	Most reported	2nd	3rd	4th
Needles	90	8	1	0
Gauze swabs	10	23	6	6
Instruments	5	5	22	6
Sponges	4	11	5	21

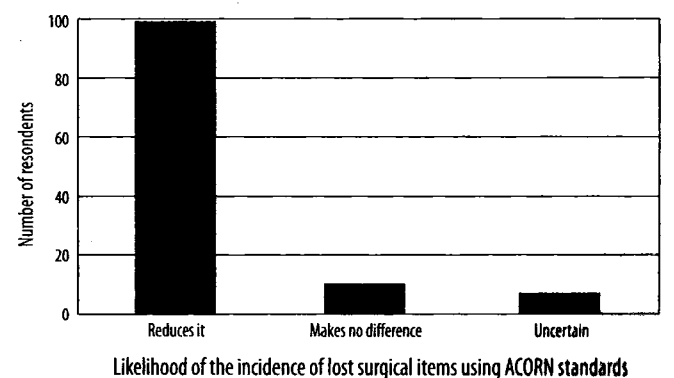
respondents also added a comment. Some noted they informed the surgeon and their director of nursing; others indicated an x-ray was completed. Some indicated incidents of this nature prompted full review of the case and/or staff "Education of staff member, etc" [NUM Q:56]. Finally, some commented that they followed up with their risk manager or clinical review committee e.g. "Incident reporting -- performance indicator" [NUM Q:96].

Respondents were asked if they believed that following the ACORN counting standard reduced the incidence or likelihood of a miscount or retained surgical item. Their responses are illustrated in Figure 2. Ninety-eight respondents (79%) believed it reduced the incidence of a miscount or retained surgical item. Ten respondents (8%) believed that following the standard made no difference. Of this group, eight stated they "always" followed the ACORN counting standard. Seven respondents (5.6%) were uncertain that following the ACORN standard reduced the likelihood of a miscount. Four of the seven who were uncertain always followed the ACORN counting standard, one followed it sometimes and the remaining two were uncertain what guided their count policy. Nine respondents (7.2%) did not answer this question. Twenty respondents also made a comment. More than half reiterated that using the ACORN counting standard reduced the risk of leaving a foreign body in a patient unintentionally, for example "Absolutely reduces risk" [NUM Q:88]. A small number of respondents noted that using the standard does not account for

**Figure 1. Methods of reporting lost surgical items.**



**Figure 2. Likelihood of the incidence of lost surgical items using the ACORN counting standard.**



human error, for example "Hopefully it reduces it (but) human error a major factor that no amount of risk management will ever stop" [NUM Q:73].

Finally, 28 responded to the last, open-ended question, which sought any other comment about the surgical count. These comments fell into three broad categories. Firstly, a number of respondents commented on the significance of the ACORN counting standard for practice, for example "The most important issue for perioperative nursing practice" [NUM Q:13]. In contrast, a third of those respondents choosing to comment questioned the need for a count for all cases or of all items, or they complained about how time-consuming the process was, for example "There seems to be a need to introduce a count policy on the basis of risk rather than mandatory counting for every case" [NUM Q:70]. Some also offered a reason why the standard may not always be used, for example "More uniformity would be nice, some places still don't do counts, it is amazing and having agency staff argue need for counts!" [NUM Q:17]. Lastly, a number commented on the role/actions of some surgeons about the count. One response follows "Bully surgeons insist RNs take short cuts. Pressure of time influences short cuts" [NUM Q:74].

These results prompted a review and analysis of the two documents that guided counting as there was a need to gain a deeper understanding of counting practices and to see what the requirements were for this practice. This analysis follows.

### Documentary review

The two documents reviewed were the *ACORN Standard A3-Counting of accountable items used during surgery* (2002)<sup>2</sup> (the ACORN counting standard), which was the specific counting standard referred to in the NUM questionnaire. Additionally, it was necessary to analyse the *Technical Series (TS)-10, Standard procedures for the handling of accountable items in operating suites* (2002)<sup>4</sup> (TS-10), a NSW Department of Health policy, as one third of NSW respondents, 14, indicated they used the latter, either alone or in conjunction with the ACORN counting standard. Both of these documents were in use at the time the research was undertaken. No other standards relating to the conduct of a surgical count were identified by any respondents. A summary of the analysis is now presented.

The ACORN counting standard contained a statement about adopting appropriate risk management strategies related to the diverse range of practice settings; however, what these strategies might be is not spelt out. It is also unclear what, if any, relationship there is between the various listed practice settings (such as operating rooms, endoscopy suites, other) and appropriate risk management strategies (or the count, for that matter). The TS-10 makes no mention of risk management strategies.

Secondly, the process described in both documents is prescriptive in nature; indeed, in some sections it is laborious. The result is that both standards impose serious limitations. By imposing this somewhat rigid, step-by-step process, both standards limit opportunities for individual perioperative nurses to exercise professional judgement about what and when to count.

Thirdly, there is no definition of an accountable item in either document. This seems important, if these are the only items the

perioperative nurse is exhorted to count. Also, neither states that the perioperative nurse should count all surgical items. Consequently, there are gaps in the processes described, as well as some contradictions in the standards.

Fourthly, in both documents it is not clear if the specific situations (called 'problem areas' in TS-10) when normal processes for the counting of accountable items cannot be followed, represent all potential problem areas. For example, one procedure may involve more than one incision site, each of which may be created and closed at different times, but how and when to track and document surgical items used in these cases is not explained. Given the prescriptive nature of the document, perioperative nurses, faced with an unusual count situation or one not listed in the document, are left with no process to follow. Further, if they have always 'followed the process', and have not had an opportunity to develop professional judgement then they may well flounder.

Fifthly, neither standard reflects the diversity and complexity of items used in surgery today, or the wide variety of materials used to produce them. The use of advanced technologies may mean these items are not easy to track or trace and require other, novel, ways of managing them safely. Simple examples include microscopic needles and complex (disposable) plastic items, neither of which are x-ray detectable. In this regard, both standards lag behind current surgical practice.

Finally, both standards are silent on other methods to manage the potentially catastrophic occurrence of an inadvertently retained surgical item other than by counting some items. There is no evidence that either counting standard is, or should be, part of a wider, systematic approach to managing this particular risk. Instead, the focus is on an isolated activity, counting, and the perioperative nurse is identified as responsible for this. It appears that the count is the only method he or she has recourse to, in order to protect the patient. These documents seem to encourage perioperative nurses to lose sight of why they count, and to focus instead on the activity itself, counting. In attempting to manage this risk, perhaps the critical question to be asked is not "Is the count correct?" but "Have we left any item in this patient?"<sup>6</sup>

Within the ACORN counting standard, mention is made of this standard being used as a benchmark in legal proceedings<sup>7</sup>. In the case of *Langley & Another v Glandore Pty Ltd (in liquidation) & Another* (1997) it was determined that the standard of care expected of nurses working in the operating suite in regard to the count is the ACORN counting standard. This case gives a clear understanding of the standard of care expected during surgery to ensure no harm befalls the surgical patient. While the surgeon must make a visual and manual inspection of the wound to ensure no surgical items remain inadvertently, it is the perioperative nurse who must confirm that all such items have been accounted for<sup>8</sup>. This ruling established that completing the count is the responsibility of the perioperative nurse and notes that the surgeon, having other activities to complete, should be able to rely on the nurse to do this.

In brief, the two documents were similar in nature and content and explicated a prescriptive process for conducting a surgical count. However, there were some differences, as well as weaknesses and gaps in the processes covered, and some contradictions.

## Discussion

It is noteworthy that the majority of respondents believed the use of the ACORN counting standard was effective in minimising the chance of inadvertently leaving a surgical item in a patient. It is generally believed that this particular activity – counting sponges and other items before, during and immediately prior to the end of surgery – helps ensure unwanted surgical items are not left behind in a patient. If such an event does occur, it can be catastrophic for the patient, causing serious illness, even death<sup>8,9</sup>. Given the gravity of the risk, processes to minimise it such as the systematic use of a counting standard are believed crucial<sup>5,8,10</sup>. Although the majority of respondents to this research believed that counting was an effective activity to enhance patient outcomes by preventing inadvertent retention of a foreign object, a minority did not.

The wide variety of responses about the incidence of miscounts and/or lost items reported in this study is worthy of closer examination. Responses ranged from nil reported by more than a third of respondents approximately 600 in a year reported by one respondent. The first finding is the high number of operating suites reporting no incidents in the preceding year. This included five operating suites where more than 500 cases are performed monthly, which is more than 6,000 cases annually. These results are inconsistent with the reports in the literature about the number of incidents of this nature. However, under-reporting of errors and adverse events is not new<sup>11,12</sup>. There is abundant literature which notes that fear of litigation encourages under-reporting, as does a culture that focuses on individual blame<sup>13-15</sup>. A handful of NUM respondents to this research noted these issues.

The second finding is related to those respondents reporting miscounts (especially those with large numbers of miscounts) or lost items, which potentially represent a retained surgical item. At first glance, this seems unacceptably high. However, a rate of about 50 incidents in one year has been reported by one large metropolitan Sydney teaching hospital completing about 7,500 operations annually<sup>5</sup>. The high number of incidents reported in this study might be indicative of complacency and/or failure to follow the standard consistently despite respondents' claims to the contrary. This has been noted elsewhere<sup>5,16</sup>. A significant minority of respondents, who did not know or who did not accurately report the number of incidents experienced (that is, they reported a range, such as 3-5), served to reinforce this notion. Alternatively, high levels of reporting may reflect environments that support those who do report incidents because this encourages openness and honesty.

Other situations that can affect the incidence of miscounts include pressure to maximise operating suite utilisation<sup>5</sup>. Although a few respondents mentioned this, it was not a significant finding here. Poor communication<sup>17</sup> and surgeons who ignore wrong counts<sup>13,18</sup> may also encourage laxness. Again, although mentioned by a small number of respondents, this was not a significant finding in this study. However, this high rate of incidents, as with those who reported no incidents, is a cause for concern.

Scrutiny of the NUM questionnaire data on the incidence of miscounts, both of the type of item most frequently lost (needles) and written comments, provided some insights. Some of these 'incidents' were claimed by respondents to be either documentation errors or cases where items initially believed lost were subsequently found. Therefore, they

were not 'lost' or left inside a patient. However, only a small number claimed this to be the case. In addition, the items reported 'lost' most often were needles; respondents claimed their size rendered them susceptible to misplacement, loss or to being miscounted. Counting and documentation errors are not uncommon and needles have been previously reported as the most frequently lost item<sup>5</sup>. The smaller sized ones are also difficult to detect on x-ray and some, such as micro-needles, cannot be detected<sup>14</sup>. Notwithstanding this, the ACORN standard notes that, in the event of a missing item, an x-ray should be performed unless contraindicated by the condition of the patient.

Finally, the question "What is the incidence of reported miscounts or incorrect counts in your OS over the last year?" solicited the highest number of non-responses, nearly 10%, which may indicate a culture of under-reporting and/or fear of blame<sup>13</sup>. These data, however, may be incomplete, as not all respondents completed all of the categories about lost items.

Overall, the results presented here are disquieting. Although on the one hand the high incidence of reporting may reflect an operating suite culture that encourages and supports such reporting, there may be other explanations. For example, those respondents who indicated they experienced incidents of miscounts but could not give a precise number may work in a culture where the accuracy of such information is not regarded seriously. A similar concern is that these results may reflect complacency, which has been reported before<sup>16</sup>. The high rate of miscounts reported could also be due to perioperative staff (nurses, doctors) working under pressure to increase operating suite utilisation, which in turn leads to carelessness. Alternatively, the high rate of incidents could be due to staff shortages resulting in nurses and others taking shortcuts or making mistakes because they are tired<sup>19</sup>. There was some evidence of all of these possible causes of the high incidence of miscounts in the data presented here.

On the other hand, the significant number, approximately one-third, who reported no incidents, along with those who failed to answer the question, is equally disturbing. It may reflect organisational under-reporting of a potentially adverse event because of fear of litigation, along with a culture that focuses on individual fault and blame<sup>13</sup>. The inadvertent retention of a surgical item is a sentinel event from a risk management/quality improvement perspective<sup>20,22</sup>. Yet little more than a quarter of respondents stated that they reported miscounts via a quality activity.

As noted earlier, counting is an activity for which the RN in charge of the case (and who is usually, but not always, the instrument nurse scrubbed assisting with the surgery) is solely responsible<sup>8</sup>. Failure to practise in accordance with the ACORN counting standard could render the perioperative nurse potentially liable in an action for civil negligence<sup>23</sup>. To help further explain the findings of this study, an exploration of the nature and incidence of this adverse event was undertaken; it is explored elsewhere<sup>3</sup>.

## Conclusion

This paper has reported the results of those data gathered from a number of sources to answer the question: is ACORN perceived to have an effect on patient outcomes in perioperative settings? The results are a compilation of beliefs and facts about the ACORN counting standard, and the incidence and nature of miscounts.

There was evidence of polarity in opinions and beliefs of the NUM respondents. While most believed in the effectiveness of the standards generally, as well as the ACORN counting standard in particular, a minority was ambivalent. The incidence of reported miscounts and lost items ranged from nil to more than 600 per year, a disturbing result but one reflected in the literature. The high number of respondents reporting no cases of lost items differed significantly from other adverse events data and may reflect a fear of reporting incidents which is catalogued elsewhere.

Despite respondents' stated beliefs about the value of the ACORN counting standard, these were sometimes at odds with their responses and comments about the nature and incidence of lost items. In conjunction with how they dealt with these mishaps, this may well indicate a wider malaise about the importance of completing an accurate count for every surgical case. Alternatively, lack of staff and pressure on resources, although not clearly identified in this study, may be causing a high error rate. However, the analysis of the two counting standards documents revealed contradictions, weaknesses and gaps in the procedures described and may contribute to respondents' varying beliefs about and use of the ACORN counting standard.

While it is necessary and proper to complete individual incident reports, which most respondents did, it is crucial for organisations to manage this kind of mishap systematically. This is via a systems approach to quality and risk management. Arguably, many of these mishaps occur because of systems failures, something now well recognised<sup>24</sup>. Yet there was evidence in this research that less than 30% of respondents dealt with incorrect counts and associated incident reports as a quality activity; however, that might have been defined, and only one or two took a risk management approach to them.

Overall, the findings from the data gathered from a number of sources to answer the question about the perceived effect of ACORN on patient outcomes are reassuring. In particular, the use of the ACORN counting standard was believed by the majority to reduce the likelihood of the incidence of a retained surgical item; a potentially catastrophic occurrence. This is a significant finding for ACORN.

However, the results also raise a number of concerns, which ACORN needs to address. These are the need for clarity and consistency in the ACORN counting standard, and for education about the necessity to adhere to the ACORN counting standard, indeed, to all standards, because they protect both the patient and the nurse. However, there needs to be acknowledgement that the ACORN counting standard should be a guideline and not a rigid, prescriptive process.

More significantly, there is a need for ACORN to broaden its approach to managing this particular risk. This could occur if additional ways and means were developed and incorporated into the standard, such as methods to detect and track all items used in surgery. This would need to be part of a systems approach, which is explored in detail in the author's unpublished thesis.

## References

1. Hamlin L (2005). Setting the standard: the role of the Australian College of Operating Room Nurses, part I. *ACORN Journal*, Vol.18, No.1, p.29-36.
2. Australian College of Operating Room Nurses (ACORN) (2002c). Standards, Guidelines and Policy Statements. Adelaide: ACORN.
3. Hamlin L (2005). Setting the standard: the role of the Australian College of Operating Room Nurses. Unpublished doctoral thesis, University of Technology, Sydney.
4. NSW Department of Health (2002). Technical Series (TS)-10, Standard Procedures for the Handling of Accountable Items in Operating Suites (5th ed). Sydney: NSW Department of Health.
5. Butler M, Boxer E & Sutherland-Fraser S (2003). The factors that contribute to count and documentation errors in counting: a pilot study. *ACORN Journal* Vol.15, No.1, p.10-14.
6. Gibbs V (2003). Retained surgical sponge. Agency for Healthcare Research and Quality, morbidity & mortality rounds on the web. Available: <http://www.webmm.ahrq.gov/cases.aspx> [accessed 12 July 2004].
7. Langley & Anor v Glandore Pty Ltd (in liq) & Anor (1997). *Australian Tort Reports*, 81-448.
8. Langslow A (2000). Getting the sponge count right. *Australian Nursing Journal* Vol.7, No.6, p.42-43.
9. Gawande A, Studdert D, Orav E, Brennan T & Zinner M (2003). Risk factors for retained instruments and sponges after surgery. *New England Journal of Medicine* Vol.348, No.3, p.229-235.
10. Junttila K, Salanterä S & Hupli M (2000). Perioperative documentation in Finland. *AORN Journal* Vol.72, No.5, p.862-877.
11. Buerhaus P (1999). Lucian Leape on the causes and prevention of errors and adverse events in health care. *Image – the Journal of Nursing Scholarship* Vol.31, No.3, p.281-286.
12. Meuric C (2000). Understanding the nature of errors in nursing: using a model to analyse critical incident reports of errors, which resulted in an adverse or potentially adverse event. *Journal of Advanced Nursing* Vol.32, No.1, p.202-207.
13. Gibbs V & Auerbach A (2001). The retained surgical sponge. In: Shojania K, Duncan B, McDonald K & Wachter R (Eds). *Making Healthcare Safer: A Critical Analysis of Patient Safety Practices*. Rockville, MD: Agency for Healthcare Research and Quality, p.255-257, AHRQ publication 01-EO58. Evidence report/technology assessment no. 43 [online]. Available: <http://www.ahrq.gov/clinic/ptsafety/chap22.htm> [28 August 2003].
14. Macilquham M, Riley R & Grossberg P (2003). Identifying lost surgical needles using radiographic techniques. *AORN Journal* Vol.78, No.1, p.73-78.
15. Wilson R, Harrison B, Gibberd R & Hamilton J (1999). An analysis of the cause of adverse events from the quality in Australian health care study. *Medical Journal of Australia* Vol.170, p.411-415.
16. Fogg D (1998). Clinical issues: OR counts. *AORN Journal* Vol.68, No.5, p.76.
17. Tingle J (1997). Evidence-based nursing and the law. Legal problems in the operating theatre: learning from mistakes. *British Journal of Nursing* Vol.6, No.15, p.889-891.
18. Smith C (2001 December 8). Surgical tools left in five patients, UW surgeons take precautions to ensure it doesn't happen again. *Seattle Post Intelligencer* (17 paragraphs) [online]. Available: [http://seattlepi.nwsource.com/local/49883\\_error08.html](http://seattlepi.nwsource.com/local/49883_error08.html) [28 August 2003].
19. Kaiser W, Friedman B, Spurling K, Slowick T & Kaiser H (1996). The retained surgical sponge. *Annals of Surgery* Vol.224, No.1, p.79-84.
20. State Government Department of Human Services Victoria (Quality branch) (2001). Clinical Risk Management Statewide Sentinel Event Reporting. Available: <http://www.health.vic.gov.au/clinrisk/sentin.htm> [1 October 2004].
21. State Government Department of Human Services Victoria (2004a, May). Sentinel Events Program: Annual Report 2002-03. Melbourne: Author.
22. State Government Department of Human Services Victoria (2004b, November). Sentinel Events Program: Annual Report 2003-04. Melbourne: Author.
23. Chiarella M (2002). *The Legal and Professional Status of Nursing*. Edinburgh: Churchill Livingstone.
24. Barraclough B (2001). Safety and quality in Australian healthcare: making progress. *Medical Journal of Australia* [online] 174, 616-617. Available: [http://www.mja.com.au/public/issues/174\\_12\\_180601/barraclough/Barraclough.html](http://www.mja.com.au/public/issues/174_12_180601/barraclough/Barraclough.html) [28 August 2003].