source of contamination. We notified the local and state health departments regarding our concern for a possible second contaminated source. During our investigation, we determined that the same manufacturer was linked to the supply of prefilled saline syringes. We immediately quarantined the prefilled saline syringes after the content of one of the syringes grew *S. marcescens* and confirmed our suspicion. On January 18, 2008, a wider national recall of all the products by the manufacturer was issued.[4]

Su et al[1] note that the probable reason that cases of *S. marcescens* bloodstream infection continued to occur through mid-December, despite discontinuation of the use of prefilled heparin syringes after November 22, was that heparin solution from lot A syringes was left in intravenous catheters and thus patients were exposed during flush procedures that occurred later. We agree with this possibility because in vitro studies[2] showed that both outbreak strains induce rather quickly a biofilm formation that can adhere to the catheter surface. However, we would like to point out another probable reason of the ongoing outbreak, in particular after the withdrawal of the implicated and first identified contaminated source: the prefilled saline syringes produced by the same manufacturer were also contaminated and they remained in use through mid-December 2007, until their eventual recall on January 18, 2008.[2]

Su et al[1] rightly emphasize the important role of public health entities in effectively communicating information and in linking any suspicious outbreaks among various institutions, to control outbreaks in a timely manner. In addition, we feel that the infection control teams played an equally important role in this outbreak. It was our infection control team that was able to identify a second unsuspected contaminated source, and we were able to take prompt action by immediately quarantining and removing it from use, thereby preventing more infections and saving lives locally and nationwide.[2]

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Simple Interventions Fail to Produce Sustained Reduction in Unnecessary Intravascular Device Dwell Time

To the Editor.—In a letter published in the May 2008 issue of the journal,[1] we showed that a set of simple, low-cost interventions produced a 7.8% reduction in unnecessary intravascular device days. The interventions were based on a daily reminder in the medical record that targeted medical and nursing staff and a daily pamphlet reminder delivered to patients. After consultation within Auckland City Hospital, a modified version of the interventions was implemented in 4 general medical wards and 2 orthopedic wards in 2008. The modifications to the interventions that had been used in the trial consisted of changing the responsibility for placing the chart reminders from clerical to nursing staff, changing from daily pamphlet reminders delivered to patients to having laminated A4-size posters placed at every patient's bedside, and minor wording changes to both reminders. An educational program about the interventions was conducted with staff before and after the introduction of the interventions.

To assess whether the effectiveness of these interventions was sustained over time, we gathered data on intravascular device (IVD) presence and necessity for a 5-day period before the introduction of the interventions and then for a 5-day period 4 months after the introduction of the interventions. Each patient on the wards involved was assessed daily, and the number of IVDs in situ was recorded. Each assessment of a patient was counted as a patient-day. Presence of an IVD was counted as an IVD day. If a patient had more than 1 IVD in place, an IVD day was counted for each device. During the second audit period, data were also gathered on whether the chart reminder was present in the notes in the medical record, whether the reminder had been completed, whether the completed reminder had been acted on, and whether the patient reminder was visible from the patient bedside (this was assessed only on day 1).

The results obtained during the baseline and intervention

periods are shown in Table 1. The percentage reduction in unnecessary IVD days after implementation of the interventions was 2.0%; this was not statistically significant ($P = .43$). On 619 patient-days, patients had been present on the ward at the time that reminders were placed in the notes; on 311 (50.2%) of those days, the reminder had been placed in the medical record notes. The reminder in the medical record notes was completed on 146 (46.9%) of those 311 patient-days. Eighty-two (56.2%) of the 146 reminders requested that any IVD present be removed. On 13 (15.9%) of the 82 days when IVD removal was requested, an IVD was still in place when reviewed. Patient reminders were visible at the bedside of 71 of the 124 (57.3%) patients assessed on day 1. In 46 (37.1%) of the 124 bedspaces, the patient reminder was optimally placed for patients to see, and in 25 (20.2%) the positioning was suboptimal (out of sight from usual patient position).

These results show that the initial effectiveness of our interventions[1] has not been sustained during continued implementation. Several factors may have contributed to this. The first factor is the modifications to the original interventions. Nursing staff (rather than clerical staff as in the original implementation) have been given the responsibility for placing reminders in patient's medical records; however, nurses have numerous responsibilities that may interfere with this task. The change from daily patient pamphlet reminders to reminder posters at the bedside may have reduced the effect of these reminders on patients.

The second factor is poor adherence of healthcare workers to the medical record reminder intervention, despite an educational program designed to improve awareness of and adherence to this intervention. Reminders were placed in the medical records of slightly more than half of the patients, and less than half of the reminders present in the notes in the medical records were completed. We could not fully assess removal of IVDs by nursing staff in response to the reminders in the medical records; however, on 15.9% of patient-days during which the chart reminder requested removal of an IVD if present, the IVD was still in situ at the time of assessment. The design of the medical record reminder intervention requires 3 separate actions at 3 separate times (nursing staff placing the reminder in the medical record, medical staff completing the medical record reminder, and nursing staff removing an IVD in response to the reminder) and may be too complicated to be successful in our hospital environment. With the current design of this intervention, if any 1 of the 3 steps is not completed, the intervention will fail.

The third factor is the poor placement of the reminder posters, which is likely to markedly diminish their effectiveness given that they were not at all visible in more than 40% of bedspaces. The fourth is that it is possible that our sample size was too small to show a statistically significant result.

Prevention of IVD-related infections, especially catheter-related bloodstream infections, is an important infection control issue.[2] The long-term implementation of our interventions, which were aimed at reducing unnecessary IVD dwell time, has not resulted in a sustained significant reduction. It is possible that some improvement in the effectiveness of our interventions might be gained by reverting to the original, unmodified interventions. It is also possible that feedback such as this audit may improve adherence by medical and nursing staff; however, the presence of an ongoing educational program encouraging adherence during the implementation of these interventions makes this seem unlikely. Other, more proscriptive and resource-intensive approaches such as mandatory daily use of checklists or review of all patients with IVDs by a dedicated intravenous access team may be required to achieve sustained reductions in unnecessary IVD dwell time at Auckland City Hospital.

TABLE 1. Total, Necessary, and Unnecessary Intravascular Device (IVD) Days during the Baseline and Intervention Periods

Variable	No. (%) of days		P[a]
	Baseline	Intervention	
Patient days	556 (100.0)	630 (100.0)	...
Total IVD days	333 (59.9)	372 (59.0)	.81
Necessary IVD days	215 (38.7)	251 (39.8)	.72
Unnecessary IVD days	118 (21.2)	121 (19.2)	.43

[a] Fisher exact test (2 tailed) was used.

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