Quality in practice: implementation of hospital guidelines for patient identification in Malawi

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Abstract

Quality problem or issue. Patient identification in a teaching hospital in Malawi.

Initial assessment. 34% of hospital staff recalled a misidentification event in the preceding year; less than 10% of staff described the use of unique patient identifiers other than name when taking blood samples and 98% of laboratory requests included no identifiers other than name.

Choice of solution. Hospital identification guidelines based on WHO guidelines to introduce identification wristbands; encourage routine use of an identifier in addition to name on laboratory requests and improve bedside identification procedures.

Implementation. Provision of wristbands, educational materials, workshops and distribution of written materials to promote the new guidelines with regular monitoring.

Evaluation. At 5 months 65% of in-patients wore wristbands compliant with WHO identification guidelines and 55% of cross-match forms used a second identifier. Only 10% of non-cross-match forms had a second identifier. The use of recommended bedside identification procedures was rarely observed. Guidelines were welcomed by both staff and patients; identification wristbands were found useful in difficult identification situations. Lack of time, staffing and unimportance of procedures were given as reasons for not following guidelines.

Lessons learned. Identification procedures can be rapidly introduced in a developing world context in a manner acceptable to patients and staff. Tangible tools such as wristbands appeared easier to implement than changing practice by education. Recommendations for wider implementation include increased engagement of patients in addition to healthcare and management staff; use of rejection criteria for inadequately labeled samples; generating further evidence about the prevalence, type and consequences of patient misidentification events.

Keywords: Malawi, developing countries, patient identification systems, safety management, education

Introduction

Background knowledge

Misidentification of patients is acknowledged as an important and preventable cause of patient harm. For example, patient misidentification remains the commonest cause of ABO incompatible blood transfusion despite preventative efforts [1, 2]. The extent of misidentification is under-recognized but in the USA, identification errors were found in around 1% of laboratory requests [3, 4] and were the root cause in over 100 incidents reported between 2000 and 2003 [5, 6]. The World Health Organization (WHO) considers identification a priority area for improving patient safety, recommending that all healthcare organizations should have systems for ensuring correct identification, provide staff training and offer patient education on identification [7].

Patient safety in general and identification in particular has received less attention in the developing world, even though the first impression of western trained staff is often the frequency of preventable adverse events [8]. The WHO have
started to address patient safety as an international concern [9] but published evidence remains scarce [10]. The WHO report ‘Patient Safety in African Health Services’ in 2008 [11] included the safety of blood, medicines and surgical procedures as key areas to improve; patient identification is integral to safety in all of these areas.

Patient identification is an attractive target for improving patient safety as it impacts on all areas of hospital care and does not need high technology resources. There is almost no published data regarding the prevalence of misidentification in the developing world. One study from South Africa [12] showed errors in identification recording in as many as 60% of critical laboratory result notifications, suggesting that identification is indeed a serious issue. However, there are many real and perceived challenges in implementing identification systems in developing countries, such as understaffing, lack of staff awareness of misidentification as a problem and the difficulty in establishing need, given the absence of systems for adverse event recording [13, 14]. Moreover, there is little information about the acceptability to patients of identification tools such as identity wristbands [15] (Table 1).

**Local problem**

Malawi is the 23rd least developed country according to the 2009 UN human development index and has a per capita health expenditure of $17 per year [16]. As in many other developing countries, systems for ensuring correct patient identification are weak or non-existent. As an example, the author’s experience over a year working in the major teaching hospital in the country prior to this intervention suggested the absence of formal guidance on patient identification, of tools such as wristbands to assist accurate identification and of use of identifiers other than patient name. At the same time, the care environment entailed a high risk of misidentification, with patients frequently having similar names and unknown dates of birth, overcrowded wards with several patients in the same bed or on the floor, and reliance on manual systems for sample reception and specimen identification in the laboratory.

**Intended improvement**

This paper describes a brief intervention strategy attempting to develop, implement and evaluate a package of interventions for improving patient identification in the major university teaching hospital in Malawi. The primary motivation behind the intervention was to reduce risk of sample misidentification in the laboratory, particularly for transfusion, by improving identification procedures. In addition, information was collected to estimate staff awareness of misidentification, perceived barriers to correct identification and use of identification procedures before and after intervention. The intervention was developed and implemented over 1 year as illustrated in Fig. 1.

**Methods**

**Ethical issues**

A formal study of staff attitudes and review of effectiveness to support the intervention was approved by the ethics committee of the College of Medicine, Blantyre.

**Baseline setting**

The baseline state of identification practices was measured by recording existing use of identifiers and by staff consultation.

**Planning the intervention**

Semi-structured interviews were used to determine the awareness of misidentification events, prior training in patient identification, self-reported identification practices and

![Table 1](https://academic.oup.com/intqhc/article-abstract/24/6/626/1823590)

**Table 1** Summary of self-reported identification practices. Respondents were asked to ‘Imagine that you are taking a blood sample from a patient. Describe how you would identify the patient and what details you would write on the request form and specimen tube’

<table>
<thead>
<tr>
<th>Use of identifiers</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Procedure: any ID other than name</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>Procedure: check documents</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Procedure: unique ID</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Form labeling: unique ID</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Specimen labelling: any ID</td>
<td>7</td>
<td>7</td>
</tr>
</tbody>
</table>

![Figure 1](https://academic.oup.com/intqhc/article-abstract/24/6/626/1823590)

**Figure 1** Timescale of the intervention.
attitudes towards proposed procedures, in particular the use of identity wristbands. The interview was conducted by two interviewers using a standard script, which was also given to the interviewee to read. Interviews were recorded on tape and transcribed verbatim using a structured template.

Objective data on baseline use of identifiers was obtained by review of laboratory request forms. All available blood transfusion requests over 1 month and all available laboratory requests over 1 week were retrospectively reviewed by a senior member of laboratory staff against WHO criteria (use of either date of birth or hospital number on the request forms).

Based on the findings of the baseline survey (Table 2), a package of interventions was developed to introduce hospital-wide recommendations for patient identification.

### Development of identification guidelines

Guidelines from WHO [16, 17] were used as the basis for the new recommendations, which were developed in consultation with the senior nursing staff and the hospital information system staff. Although the primary motivation was the improvement of identifier usage for laboratory requests, it was considered that the scope of the intervention should include other aspects of care where patient identification is critical. Three key areas for improvement were promoted in the following recommendations:

1. The use of at least two points of identification (name + either date of birth or unit/hospital number) on specimen request forms and samples.
2. Introduction of handwritten patient wristbands with standardized patient identification details: name, date of birth, hospital/unit number and ward.
3. Promotion of improved identification practices (positive verbal identification of patients and cross checking with wristbands and documentation) when performing identification-critical procedures. Procedures specifically mentioned included administration of medication, transfusion, venipuncture, anesthesia and surgery.

### Delivery of an educational programme

Educational materials were produced to introduce the recommendations and to address specific gaps in knowledge among hospital staff about patient identification. The materials included background information on the importance of identifying patients, suggestions for how to disseminate information in their own units, self-assessment questionnaires and suggestions for dealing with difficulties in following identification procedures.

The recommendations were publicized through workshops and presentation at clinical meetings. Written guidelines, training materials and posters were also widely distributed in the hospital. Training workshops were primarily targeted at senior nursing staff and were designed to facilitate and encourage staff attending to disseminate the recommendations to other staff. Nursing staff were chosen as the main group to target as they are the largest group of healthcare staff in the hospital, have the most frequent exposure to identity-critical procedures and are most closely involved with admission procedures where identification procedures can be initiated. A separate workshop was held for ward clerical staff, who were encouraged to ensure that all patients in their ward had hospital identification numbers and wristbands. Further training meetings were conducted monthly and were aimed at new staff or staff who missed the initial training sessions. Medical staff were informed of the policy through presentations at regular clinical meetings. No financial incentives were offered for attendance at workshops or for compliance with the recommendations.

### Implementation of patient identification tools

A 1-year supply of identification wristbands was provided to the hospital as a donation, on the understanding that the hospital would take over procurement subsequently. The use of improvised identification wristbands, for example using surgical tape, was also explicitly promoted in the guidelines in the event that wristbands were not available. Supplies of wristbands were made available on all wards and points of admission to the hospital.
Although not planned as part of this intervention, a further patient identification tool was also introduced between the baseline survey and implementation of guidelines. An improved transfusion cross-match form which included space to complete the date of birth and hospital number was implemented; the laboratory was encouraged to refuse requests which were not on the correct form.

Planning the study of the intervention

Evaluation was designed to be simple and minimally disruptive to daily working practices, with the aim of demonstrating qualitative improvement from an effectively zero baseline.

Evaluating usage of wristbands. The success of implementing the physical aspects of the intervention was monitored by estimating the proportion of in-patients wearing wristbands and the number of wristbands with two points of identification. This was estimated by directly examining all in-patients at a single timepoint on the admission ward and on one arbitrarily selected ward from each department. Monitoring was repeated monthly on the same wards.

Evaluating extent of practice change. The success of the intervention in effecting practice change was monitored by examining the use of identifiers on laboratory request forms and by direct observation of clinical practice.

Request forms or samples over a 1–2 day period sufficient to achieve ~100 observations were examined monthly. The standard monitored was compliance with the guideline recommendation for use of either date of birth or hospital number in addition to name.

Compliance with the recommended bedside identification practices was monitored by direct observation of procedures covered in the recommendations. In order to avoid changing practice by staff awareness of being observed, observation was performed opportunistically by the investigators during the course of their own routine work in the hospital. Consent for observation was not sought from staff but this was not felt to be unethical as their behavior would have been observed in any event and recording was anonymized.

Evaluating acceptability. The impact of the recommendations and training on staff attitudes was assessed by administering a structured questionnaire 5 months after implementation. Participants were asked to complete a written questionnaire in ‘agree with statement’ format with items covering training received, their current practice in identifying patients and their attitude to procedures implemented. The exact questions asked are presented in Tables 3 and 4. Subjects agreeing with the statement ‘wristbands have been useful in my daily practice’ were invited to give specific examples in free text. In addition, comments made by staff to the investigating team, either informally during the study period or during consultative workshops, were recorded in a diary.

Data analysis

Common themes were identified by the investigators by review of interview transcripts, and a coding system was used to record which themes were mentioned in each interview. Coded responses were stored in a database, together with illustrative examples. Statistics were calculated using Analyze-it and Microsoft Excel.

Results

Baseline environment

Baseline review of identifiers confirmed a very low usage of identifiers on laboratory forms. 592/603 (98%) of blood transfusion request forms and 531/537 (99%) of general laboratory requests used the patient name as the only identifier.

Structured interviews were conducted with a range of clinical staff (81 nursing staff, 9 medical/clinical staff and 5 students) covering all hospital departments. The median length

<table>
<thead>
<tr>
<th>Statement</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Total</th>
<th>Effect of workshop attendance (P)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>I need further training on how to check ID</td>
<td>25</td>
<td>32</td>
<td>8</td>
<td>10</td>
<td>46</td>
</tr>
<tr>
<td>I know my patient so I don’t need to check ID</td>
<td>62</td>
<td>78</td>
<td>11</td>
<td>14</td>
<td>7</td>
</tr>
<tr>
<td>Procedures for checking ID are too time consuming</td>
<td>53</td>
<td>66</td>
<td>12</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Patient ID is not easily available</td>
<td>62</td>
<td>78</td>
<td>9</td>
<td>11</td>
<td>9</td>
</tr>
<tr>
<td>Procedures for checking ID are not sustainable</td>
<td>44</td>
<td>59</td>
<td>20</td>
<td>27</td>
<td>11</td>
</tr>
<tr>
<td>There are more important issues on ID procedures</td>
<td>42</td>
<td>55</td>
<td>14</td>
<td>18</td>
<td>21</td>
</tr>
<tr>
<td>Wristbands have been helpful in my daily practice</td>
<td>11</td>
<td>14</td>
<td>18</td>
<td>23</td>
<td>24</td>
</tr>
</tbody>
</table>

A total of 83 subjects answered questionnaire which was given in single-choice format. Subjects who did not answer the question are not included in the data. Significance levels for the effect of workshop attendance on subsequent attitudes are obtained by chi-square test on a contingency table categorized by answer (yes/no) to the question ‘I attended a training session or presentation on patient identification’.
Table 4 Staff attitudes 5 months after implementation: self-reported identification practice in response to the stated question

<table>
<thead>
<tr>
<th>Statement</th>
<th>‘Usually’/‘always’</th>
<th>‘Sometimes/rarely/never’</th>
<th>Effect of workshop attendance (P)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>I write hospital no. or ward ID no. on request forms</td>
<td>64%</td>
<td>36%</td>
<td>0.11</td>
</tr>
<tr>
<td>I write date of birth on request forms</td>
<td>74%</td>
<td>26%</td>
<td>0.7</td>
</tr>
<tr>
<td>I ask patient to tell me name before taking a blood sample</td>
<td>70%</td>
<td>30%</td>
<td>0.53</td>
</tr>
<tr>
<td>I check wristband when taking a blood sample</td>
<td>49%</td>
<td>51%</td>
<td>0.07</td>
</tr>
<tr>
<td>I check wristband when giving medication</td>
<td>40%</td>
<td>60%</td>
<td>0.37</td>
</tr>
<tr>
<td>I check wristband when giving transfusion</td>
<td>65%</td>
<td>35%</td>
<td>0.91</td>
</tr>
</tbody>
</table>

A total of 83 subjects answered questionnaire which was given in single-choice format. Subjects who did not answer the question are not included in the data. Significance levels for the effect of workshop attendance on subsequent attitudes are obtained by chi-square test on a contingency table categorized by answer (yes/no) to the question ‘I attended a training session or presentation on patient identification’.

Changes associated with the intervention

Monitoring of wristband usage showed that implementation of physical hardware was successful, with a high proportion of correctly completed wristbands (Fig. 2A).

Change in identifier usage in laboratory requests

Change in identifier usage was less widespread at the end of the evaluation period. Few laboratory request forms or cross-match specimens used a second identifier other than name (Fig. 2B). The use of identifiers on cross-match request forms improved substantially, with usage of an additional identifier in around half. The marked improvement in identifier usage for transfusion requests using the new stationery compared with the minimal improvement for general laboratory requests using the older unmodified stationery suggests that the introduction of stationery with space to record identifiers was the primarily effective intervention. This is corroborated by a separate review of 44 unselected cross-match requests submitted on incorrect stationery—none had two points of identification.

Changes in bedside practice

Direct observation of staff practices also showed low levels of compliance with the recommendations. A positive identification request was observed in 0/5 blood transfusions and 1/29 phlebotomy events; cross-checking identification with wristbands was observed in 0/5 transfusions and 5/29 phlebotomy events. A total of 319 medication administration requests were observed in 22 independent ward visits. No positive identification requests were observed during medication administration; a cross check with wristband was observed ‘rarely’ in 3/22 visits and ‘never’ in 19/22.

Acceptability of the intervention

The post-implementation staff questionnaire indicated that almost all subjects (79/83) had seen some form of educational materials about identification recommendations. Respondents were mostly nursing staff (75/83), but covered all departments in the hospital. Comparison of responses between respondents who reported attending a training session and those who did not attend showed that participants who attended the workshop were more likely to have found wristband introduction useful (P = 0.02), and less likely to express the need for further training (P = 0.04). However, there was no significant effect on other attitudes or self-reported practice (Tables 3 and 4).

Nevertheless, 62% of respondents agreed with the statement that ‘wristbands have been helpful in my daily practice’. Although compliance with the intended hospital identification post-qualification was 16 years [range: <1–40 years]. 35/93 evaluable responses described having previous training in patient identification.

Self-reported practice for patient identification suggested a low baseline standard of patient identification practices: <10% described the use of an identifier other than name in bedside identity checks or when completing request forms and specimen labels for blood transfusion. There was some awareness of misidentification events. 22% of participants were able to ‘recall and describe’ at least one incident in their career where ‘a patient had received blood meant for another patient’; 34% of subjects gave an answer other than ‘none’ when asked to ‘estimate roughly the number of times that a patient might have received blood or medicine intended for another patient in your unit in the last year’. Awareness of actual harm was less evident, with only two events causing serious morbidity or death being recalled in the preceding year.
policy was low, staff had found wristbands useful in difficult identification situations such as the unconscious patient or where patients had similar names, and in additional circumstances not explicitly covered in the recommendations, for example distinguishing whether an individual was a genuine hospital in-patient rather than a visitor or an impostor seeking shelter. Importantly, one event where administration of blood to the wrong recipient was prevented was explicitly described.

Anecdotal observations were of interest, especially those concerning patient attitudes. Wristbands were mistrusted early in the study; patients were seen hiding wristbands under clothing or removing them. However, once a good level of coverage was achieved patients appeared to support the use of wristbands; indeed, patients themselves requested that wristbands be attached. In contrast, engagement of ward staff downstream of the admissions unit appeared harder to achieve; for example on one occasion when wristbands were unavailable on the admissions unit the number of patients on wards wearing wristbands fell rapidly almost to zero even though wristbands were available in the hospital stores.

Suggestions frequently given by staff for improving the policy and its uptake included more involvement of patients, the importance of continued supervision and training, local sourcing of wristbands, increased public education during health promotion sessions and increased media coverage.

**Discussion**

**Summary**

We have described a pilot intervention to improve patient identification in Malawi. We showed that patient misidentification was common; a third of staff interviewed recalled a misidentification incident in the preceding year; only 6% of staff reported using identifiers other than name to identify patients when carrying out procedures or completing laboratory forms.

Using self-evaluations, and continuous monitoring, we showed that the new patient identification practices were welcomed by staff and could be introduced rapidly. Within 5 months, two-thirds of patients were wearing a wristband: almost all of these wristbands had two unique identifiers and therefore complied with WHO recommendations. The use of unique identifiers on blood transfusion request forms improved markedly as a result of the education programme and the introduction of new forms. However, other aspects of practice remained at low levels post-intervention: correct completion of other types of laboratory forms and adequate labeling of laboratory specimens remained low at 10–20%.

**Relation to other evidence**

The wristband coverage achieved in our hospital compares very favorably to hospitals in the developed world [18, 19].
Poor concordance with bedside practices despite training has also been shown in several studies in the developed world [18–21].

Limitations

This paper presents experience from a single hospital and so care must be taken with generalizing the findings to other settings. Despite the limited monitoring processes which were designed with simplicity rather than academic rigor in mind, and the potential for bias due to non-blinded observation, the qualitative findings of improvement from zero are likely to be robust. Discrepancies between self-reported practice and observed practices suggest that the interview descriptions of practice should be considered as lower bound of the level of staff knowledge regarding desirable practice. Similarly, the recall rates for misidentification events underestimate the true level of misidentification, as events may either have been missed or suppressed. Nevertheless, the perceived level of misidentification is itself an important metric, as it reflects the awareness of the need for improvement.

Interpretation

Our study represents a first step in improving identification, demonstrating feasibility and acceptability of a number of strategies. Our experience suggests that some strategies had been more effective than others. Physical tools such as wristbands and identification forms appeared easy to implement and widely acceptable, but education and promotion of recommendations appeared less effective.

Long-term sustainability will require further work and the involvement of stakeholders at all levels, from patients and grassroots healthcare staff up to policy-making levels. Stronger evidence to quantify actual harm caused by misidentification is vital; although we have shown there is awareness of misidentification, the perceived level of actual harm remains small compared with daily experience of unavailable drugs, broken equipment and acute illness. Healthcare staff involvement can be improved by audit and continuous monitoring as has been shown in other African contexts [21, 22], and this has been shown to reduce identification errors [23]. The effectiveness of the new transfusion form in changing actual practice suggests that wider use of redesigned stationery and introduction of rejection criteria for inadequately labelled laboratory samples or drug prescriptions may be an effective tool. Finally, patient involvement should not be underestimated as a tool for improvement. It has been suggested that patients in Africa may have difficulty understanding healthcare interventions [7], but in our experience patients supported attempts to improve their own identification.

Conclusions

Our recommendations for wider and longer term implementation are summarized in Box 1. Many of the factors affecting compliance with the patient identification measures in Malawi, such as staff attitudes, lack of time and failure to perceive the safety procedures as important, have been described in other contexts [7, 23] and so it is likely that some of our findings may be useful elsewhere.

<table>
<thead>
<tr>
<th>Box 1. Key lessons for scaling-up patient identification practices.</th>
</tr>
</thead>
<tbody>
<tr>
<td>– Use tools such as wristbands and redesigned laboratory request forms.</td>
</tr>
<tr>
<td>– Ensure that patients, as well as nursing, laboratory, pharmacy and clinical staff and managers, are engaged in the patient identification process.</td>
</tr>
<tr>
<td>– Introduce rejection criteria for inadequately labelled laboratory samples or requests, and drug prescriptions.</td>
</tr>
<tr>
<td>– Include correct patient identification as a regular audit topic.</td>
</tr>
<tr>
<td>– Generate evidence about the prevalence, type and consequences of patient misidentification events.</td>
</tr>
</tbody>
</table>

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References


