40 YEARS OF EXCELLENCE MEDICLINIC

QUALITY IMPROVEMENT PROJECT

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INTRODUCTION

Hospitals are perceived as a safe place to which people come with the hope of regaining their health. Patients expect a speedy recovery and little or no complications. In a high care unit, setting alarms on cardiac monitors to assess vital data such as non-invasive blood pressure, respiratory rate, arterial blood pressure, central venous pressure and oxygen saturation enable nurses to take prompt action when there is a sudden change in the patient's condition. A high care unit is often experienced as a noisy environment due to ongoing alarms as well as the many daily activities happening in the unit. These life-saving machines' default alarm settings cannot be standardised to accommodate all patients, which is often the cause of excessive and avoidable alarms. It is imperative that all healthcare professionals are educated on the importance of setting alarms. Deactivation of alarms for vital data on cardiac monitors is a patient safety concern. Healthcare professionals can also develop alarm fatigue from excessive alarms.

PROBLEM STATEMENT

During Mediclinic Kloof's quality, resuscitation and mortality discussions, it was discovered that some resuscitations, escalations of treatment to the CCU and loss of life could have been prevented if cardiac monitor alarms were initially set according to specific patient clinical data on admission and per shift. This prompted the initiation of a quality improvement project (QIP) aimed at improving alarm accuracy in high care by setting alarms on the Dash2500 and Carescape 8450 cardiac monitors according to the specific conditions of patients. Complaints regarding noise in the unit were frequently voiced by patients and visitors through feedback received from patient experience surveys.

AIMS AND OBJECTIVES

This project commenced with the aim of enhancing quality nursing care. The specific objectives were:

- Accurate setting of cardiac monitor alarms measured to achieve 90% or higher. This will mitigate risks and help nurses act promptly and efficiently to save lives.
- Avoid unnecessary escalation of treatment to the CCU, accompanied by prolonged hospital stay.
- Minimise CCU psychosis in the unit.
- Improve patient experience regarding noise levels in the unit.

METHODOLOGY

This QIP commenced in March 2023 in the 15-bedded high care unit.

Research methods:

- In-service training and demonstrations were conducted for both permanent and agency staff in the unit during huddles, spot checks, bedside handovers and unit meetings. The value of alarm setting and prompt attention to alarms was explained to enable swift treatment and prevention of complications.
- Continuous communication and reinforcement were provided via the WhatsApp group channel. Feedback on progress made was given during monthly unit meetings and graphs were displayed on the noticeboard in the unit. Allied healthcare workers were verbally informed and asked for participation.
- Two measurements were used to evaluate the success of the project interventions: patient experience scores and the accuracy of alarm limits. Measurements were obtained by manually checking all the monitors in the unit for correct alarm-limit settings. A percentage was calculated to determine how many of the monitors' alarms were set according to patient-specific data. Trends for the previous 12 hours' alarm activities were also checked to ensure that alarm limits were set accurately for the entire shift. This had to be done as the results could not be printed for all monitors.

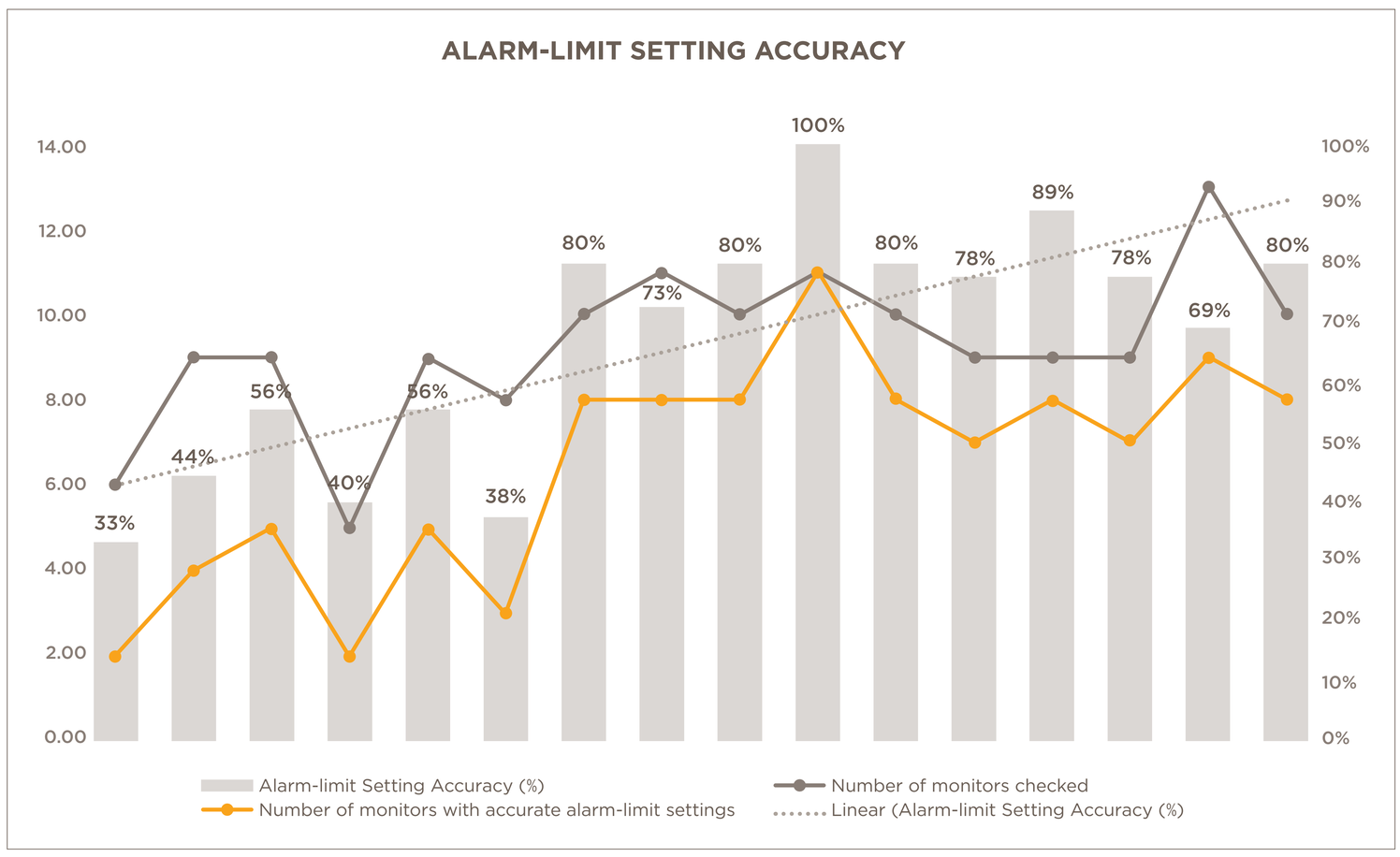
	Press Ganey Patient Experience	Accuracy of alarm-limit settings
Definition	Press Ganey is an international standard when it comes to measuring patient experience in healthcare. This measure is used to evaluate various aspects of the patient's stay in hospital. Each unit receives individual scores that represent the feedback from patients that were treated in the unit.	This measure indicates the % of monitors/patients where alarms were set at a level that is relevant to the patient. Accurate alarm settings are defined as alarms that were set to trigger when the reading of any of the measures (heart rate, blood pressure) is more than 10% above or below the normal reading. The normal reading is determined by the readings on the cardiac monitor, according to physiological levels per specific patient. Limits for all the measures/vitals must be set correctly to be seen as accurate. This is a manual measurement.
Frequency of measurement	Weekly scores are published. Daily measurement – all patients that consent to the survey will receive the survey soon after discharge.	Daily measurement. In total, 148 monitors were checked over a period of three months.
Calculation	Scores are calculated independently (by Press Ganey), based on the feedback received from patients.	% of monitors/patients per week. If there are 15 patients in the unit, and 13 of these patients' monitors were set with accurate alarm limits, then the % for the day will be 86%. The daily scores (not %) were added up to calculate the weekly % for the unit.

RESULTS AND DISCUSSION

Ongoing monitoring and observation on the progress of the project showed a positive response and interest in the implementation by nursing staff. Between the period April 2023 and July 2023, 148 monitors were checked for correct alarm-limit settings and 113 were compliant. This explains the health risk to which patients in this high care unit were exposed. The monitoring of alarm trends in the mornings during bedside handover also revealed that alarms went off mostly during the night for longer times.

Alarm-limit setting accuracy

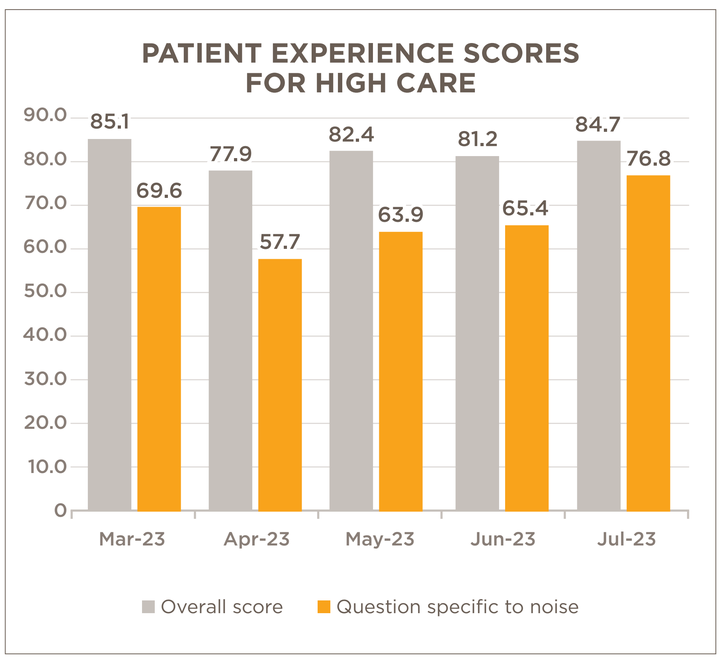
The accuracy percentage has increased satisfactorily from 33% in April 2023 to 80% in July 2023. An average weekly increased accuracy can also be seen when looking at the trend from March to July.



Month	Week starting on	Number of monitors checked	Number of monitors with accurate alarm limit settings	Alarm Limit Setting Accuracy (%)
Apr-23	10 Apr	6	2	33%
Apr-23	17 Apr	9	4	44%
Apr-23	24 Apr	9	5	55%
Apr-23	1 May	5	2	40%
May-23	8 May	9	5	55%
May-23	15 May	8	3	38%
May-23	22 May	10	8	80%
May-23	29 May	11	8	73%
Jun-23	5 Jun	10	8	80%
Jun-23	12 Jun	11	11	100%
Jun-23	19 Jun	10	8	80%
Jun-23	26 Jun	9	7	77%
Jul-23	3 Jul	9	8	89%
Jul-23	10 Jul	9	7	78%
Jul-23	17 Jul	13	9	69%
Jul-23	24 Jul	10	8	80%

Patient Experience scores

The overall patient experience score in the unit was stable over the five-month period, ranging between 78 and 85. The evaluation of the noise-level scores in the unit, however, increased over the period of the QIP interventions. The QIP has raised awareness and resulted in positive healthcare outcomes and an improved patient experience. The team-approach spirit has improved significantly as everyone takes responsibility in attending to alarms.



CONCLUSION AND RECOMMENDATIONS

Many research bodies in the field of medicine, environmental health and nursing have taken a keen interest in how unset alarm parameters on life-saving machines can result in sleep deprivation, anxiety, CCU psychosis, morbidity and mortality. It is recommended that such projects be disseminated in other CCUs and high care. CCU and high care unit managers should facilitate a drive for in-service training to staff and consider drafting guidelines and policies in this regard. By improving alarm accuracy, the high care unit is experienced as a quiet, healthy environment where patients feel safe and chances of resuscitations become less likely.

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