CONFERENCE ABSTRACT

Improving Compliance to Clinical Alarm Safety in Adult ICUs of a Tertiary Hospital in India

Minimole Varghese, Bincy Sunil Thomas

With increasing number of devices with alarms a corresponding increase in clinical alarm-related adverse events was witnessed in ICUs of given hospital. Events like missing of vital alarms, not responding promptly and indefinite suspending alarms, etc., were on rise. Checking alarm settings before admitting patient to ICU was not being routinely followed, at times alarm settings of previously admitted patients being followed for new patient.

ICU audits revealed that alarm settings for vital equipment like cardiac monitors & Ventilators were inconsistently documented (only 60%). The absence of appropriate documentation was identified as a safety threat. For instance, for ICU patients transferred-out to wards on non-Invasive ventilator (BiPAP), healthcare providers were not able to effectively manage alarm triggers due to lack of clarity regarding device settings.

A survey conducted among nurses (n-131) indicated that alarm fatigue had set in, indicating high numbers of false alarms, leading to actionable alarms not being promptly responded to. Another survey for ICU patients (n=20) elicited that 45% patients experienced unbearable noise levels with 75% citing high noise levels to equipment alarms.

The need for streamlining gaps led to rigorous brainstorming by relevant team members and designing of a protocol for clinical alarm safety. It involved identification of devices that triggered vital alarms, standardization of volumes & tone of alarms as per urgency, creation of default settings for cardiac monitors & need for documentation of ventilator as well as BiPAP settings by Clinicians, including the change of settings. Central monitoring system was uniformly installed in ICUs.

The protocol further required nurses to: (1) ensure adequate skin preparation before ECG lead application; (2) check all device alarm settings, leads and all connections on patient admission to the unit & start of every shift; (3) ensure updating of patient demographics on devices with each new patient, (4) change defective equipment & accessories as indicated; (5) escalate to Clinicians the need to change settings for acceptable deviation of patient's vital parameters. ICU team was alerted against suspending alarms without valid Clinician's prescription. Biomedical team performed weekly alarm checks and conducted equipment trainings with added focus on clinical alarm troubleshooting. Additionally, training was imparted on: possible reasons for alarms, priority-wise responding to alarms, escalation of patient condition as per need, monitoring and management of patients on transit with critical equipment support.

Post implementation of protocol there was improvement in compliance to alarm safety in adult ICUs, which increased from 61.42% (Nov-2023) to 90.25% (April-20240). Alarm related incidents reduced from an average of 1.54 per month to 0 post implementation of protocol.

The protocolling and standardization brought about improvement in clinical alarm safety in adult ICUs with zero instances of alarm-related adverse events. Considering the improvement in adult ICUs, the protocol was extended to pediatric ICUs with creation of age-based default device alarm settings.