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Alarm Fatigue

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PATIENT CARE ISSUE

- The phenomena of repeated false alarms over time causes nursing staff to become **desensitized**, responding less frequently and less punctually resulting in **compromised patient care and safety** [1]
- Characterized and caused by false positive and clinically insignificant alarms[1]
  - Referred to as the "crying wolf" effect [2]
- The Joint Commission (TJC) estimates 85-99% of alarms are insignificant[3]
  - Reinforced by Graham, who estimated < 1% of alarms resulted in nursing intervention[4]
- In 2013, TJC issued a Sentinel Event raising awareness about alarm fatigue, requiring hospitals to create guidelines for medical equipment alarms[3]
  - The new policies need revision and further study before a definitive answer can be recommended to reduce noise and increase nursing efficiency
- Florence Nightingale in *Nursing: What It Is, and What It Is Not*: "Unnecessary noise, then, is the most cruel absence of care which can be inflicted either on sick or well" [5]

REGISTERED NURSE INTERVIEW

- Healthcare team Interviewed: RN and RN team leader of Cardiac floor and RN on Pulmonary Advanced Care Unit of local magnet hospital[6]
- Awareness of issue: RNs were aware of the issue and daily experience the effects of alarms
- Knowledge of current policy: limited knowledge of hospital policy, no knowledge of EBP
- Effect on Nursing: decreased sense of teamwork, increased frustration, heavy reliance on clinical judgment as opposed to monitors and responding to every alarm
- Positive influences: team meeting awareness, soundproofing materials on walls, individual patient rooms, numerous hall monitors, and quick alarm response times

EVIDENCE-BASED PRACTICE QUESTION

Question: For hospital nurses, do structural system changes as compared to individualized monitoring decrease alarm fatigue and increase patient safety?

P = Hospital nurses
I = Structural changes
C = Individual monitoring
O = Alarm fatigue & Pt safety

METHODS

Database	Keyword	Limitations	Retrieved	Selected	Inclusion Criteria	Exclusion Criteria
CINAHL Plus with Full Text	"alarm fatigue"		90	3	Articles addressing hospital settings, patient monitoring alarms, alarm fatigue, and interventions were included	Articles not medically related, home care based, or measurements based on db. levels
CINAHL Plus with Full Text	"alarm fatigue and patient safety"	Full text, references, and abstract available	2	1		
CINAHL Plus with Full Text	"alarm fatigue"	Full text and abstract available	4	1		
CINAHL Plus with Full Text	"hospital noise"		450	2		
One Search	"nursing noise fatigue"	Full text, published 2009 or later	311	1		
One Search	"noise effects nurses"	Full text, published 2009 or later	246	3		
PubMed	"critical care noise"	Full text, published 2009 or later	361	1		

LIMITATIONS

Low Level of Evidence → 7 of 10 research articles LOE <5 → Findings only moderately generalizable

RESULTS

- **Architectural Changes.** Includes building new hospitals or remodeling existing hospitals with sound proof rooms, acoustic ceiling tiles, and location of alarm devices. Includes purchasing new equipment based on auditory impact and not just function and price, and placing multiple nurses stations throughout patient care units. [7,8,9,10]
- **Smart Alarms.** Take into account multiple parameters; includes balancing telemetry, oximetry, BP, pulse and rate of change to evaluate whether a change is clinically significant before sounding an alarm. [2,11,12]
- **Individualized Monitoring.** Outcome is to customize patient monitor default ranges to avoid repetitive alarms of previously known and documented information (e.g. pt normal of tachycardia). **Nurse Teaching.** Initial and ongoing teaching that promotes equipment competency and ease of monitor use. Training is unit-specific and enables the nurse to initiate individualized monitoring. [1,2,4,10,11,12,13,14]

SYNTHESIS OF EVIDENCE

- Architectural changes are effective in reducing overall noise and can contribute to better unit organization in general, producing a better environment for patient healing
  - However, they do not specifically address alarm fatigue
- Smart alarms greatly reduce the number of overall alarms, particularly false alarms, and can be very effective, alerting nurses to actionable alarms
  - New technology, equipment, and training leads to unreasonable costs
- Nurse training, geared toward teaching nurses to use current equipment more effectively, only moderately decreases excessive alarms
  - Debatable if cost of training and software updates outweighs benefits

EVIDENCE-BASED PRACTICE RECOMMENDATIONS

- **More high level research needs to be performed, particularly focusing on patient safety**

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