

# Clinical value of epilepsy alarms for improvement of patient safety

Christian P. Hansen, René Mathiasen, Jørgen Alving, Birgitte H. Jensen, Ellen H. Jensen and Signe Madsen.

Danish Epilepsy Centre, Dianalund  
Kolonivej 1, DK-4293 Dianalund, Denmark

## Purpose

To test the clinical value of bed alarms and pulse oxymeters in the Danish Epilepsy Centre, Dianalund.

## Methods

In-patients at increased risk of generalised convulsive seizures were supervised by video-cameras during the time spent in bed. The signals from the video-cameras were transmitted to a central supervision unit where a nurse was watching the screens with patients under supervision. Each bed was equipped with a seizure alarm, and the patient carried a pulse oxymeter. The sensitivity of the alarms (probability of alarming in case of seizure) and the occurrence of false alarms were registered.



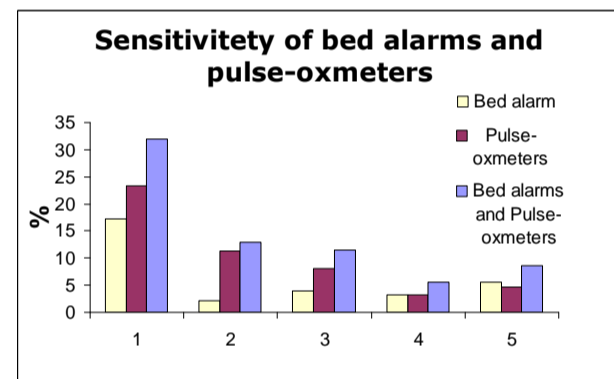
Pulse oxymeter Nonin Avant 960030



Epilepsy bed alarm KNOP 2000

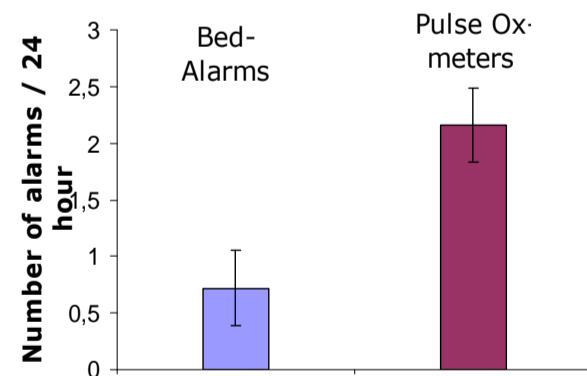
## Results

Parameter	Number
Patients	150 (71 F, 79 M)
Patient hours	11.610
Total number of seizures	2.640
Generalised tonic-clonic seizures	302
Tonic seizures	790
Focal seizures	381
Myoclonia	538
Other seizures	629



The figure shows the sensitivity (%) for bed alarms (yellow bars), pulse oxymeters (purple bars) and for the combined use of the two alarm types in generalised tonic-clonic seizures (1), focal seizures (2), tonic seizures (3), myoclonia (4), and other seizures (5).

## False Alarms



The figure shows the number of false alarms (means and standard deviations) per patient per 24 hours for bed alarms (blue bar) and pulse-oxymeters (purple bar).

## Conclusion

At the most, the combined use of bed alarms and pulse oxymeters leads to detection of a third of epileptic seizures in patients at high seizure risk. False alarms occur frequently. Consequently, the clinical value of the epilepsy alarms is limited. There is a need for development of better technology for the provision of safety for epilepsy patients