Epilepsy alarms and monitors

Introduction:

Epilepsy alarms and monitors are devices designed to detect seizures and alert caregivers when a person is experiencing a seizure. There isn't enough evidence yet to show that using a seizure alarm or monitor can guarantee someone's safety during a seizure or prevent sudden unexplained death in epilepsy (SUDEP) that is why some people with epilepsy have found using alarms and monitors helpful as part of a risk reduction plan.

Most seizure alarms are designed to detect tonic-clonic seizures. These seizures are easier to detect because they involve movement.

How to choose:

- ### infos:

  Most of the alarms and monitors systems detect movement, but some detect sound, heart-rate, urination, getting out of bed and, more recently, brain activity.

- ### Question to ask yourself:

  So fi you want to choose a system you must know what goal of detection you what by asking if you want:
  - Detection during specific period
  - Detection in or/and outside
  - Detection of the type of seizure

Type of alarms and monitoring system:

- Wearable seizure alarms and monitors
- Apps and seizure alert subscription services paired with a device
- Bed monitors
- Seizure alarms with video monitoring

How it works:

Some devices respond to repeated shaking movements, which may indicate the person is having a seizure.This can be useful for detecting tonic-clonic seizures, as well as focal motor seizures (if there is enough movement involved).

Case of common systems:

- Wearable devices, such as smartwatches or bracelets, often use accelerometers to detect abnormal movements that are common during seizures. When the system detects abnormal motion, it sends a signal to his care providers team.
  For example, the Embrace2 is a wrist-worn wearable device that detects possible convulsive seizures and instantly alerts caregivers, whether they are nearby or far away.

- Some devices utilize electrodermal activity (EDA) and photoplethysmography (PPG) to detect changes in skin conductance and blood flow, which can indicate a seizure. Machine learning algorithms can be applied to data from these sensors to improve detection accuracy.

- Bed alarms and mattress devices are placed under the mattress and use motion sensors to detect unusual movements during sleep. These devices can alert caregivers if a seizure is detected. Some bed monitors trigger an alert when it senses repetitive muscle spasms like that of a tonic-clonic/grand mal seizure.

- Seizure detection devices can also be non-wearable, such as camera devices that use infrared cameras to detect movements and trigger alarms when unusual movements are detected.