Implementation of ASET Skin Safety Guideline by Lehigh Valley Health Network Committee Improves Extended EEG Related Skin Breakdown

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BACKGROUND/ INTRODUCTION

Skin irritation has been reported during Electroencephalography (EEG) monitoring. Drees et al[1] reported skin irritation occurring in 235 (27.3%) of 861 studied patients during video-EEG monitoring; the condition was moderate or severe in 19.1%. Length of monitoring ≥4 days and electrode position on facial skin were associated with significantly higher risk. This important topic has also been looked at in the pediatric population. Pasupuleti et al[2] surveyed 7,920 patients who received continuous EEG (cEEG) from 2013 to 2015 and reported that skin injury- from scalp excoriation to deep tissue injury-occurred in 7 patients (0.09%). Intensive care unit (ICU) patients had a higher incidence of skin injury compared to non-ICU patients (0.28% vs 0.03%, p=0.002), particularly Neonatal ICU patients (0.6%, p<0.001) and Cardiac ICU patients (0.5%, p=0.003). The researchers concluded that critical illness and prolonged cEEG recordings are common in patients with skin injury.[2]

IDENTIFIED NEED

In 2015, Lehigh Valley Health Network (LVHN) neurophysiology lab noticed a considerable number of reported events of skin breakdown in the adults and pediatric population related to extended EEG procedures. LVHN recognized and identified the need to establish a committee to develop and implement a skin safety protocol across all age groups during extended EEG reading within the LVHN neurophysiology lab.

PURPOSE

Establish a Skin Safety Task Force to develop and implement a skin safety protocol within the LVHN neurophysiology lab to decrease the number of skin breakdown incidents during Long-term EEG procedures.

METHODS

The Skin Safety Task Force revised the current methods of applying EEG electrodes for Long-term EEG monitoring, and standardized a protocol for the neurophysiology lab at LVHN. A multidisciplinary committee of technologists, nurses, and doctors reviewed guidelines established by ASET – The Neurodiagnostic Society. The LVHN committee, adopting ASET guidelines, created the Skin Safety Protocol for LVHN. This protocol (summarized below) included revised procedures for skin preparation, electrode application and daily skin checks.

SKIN PREPARATION

- The skin is prepped with a less abrasive cleansing gel using quick strokes in one direction.
- Any residual gel is wiped from the patient's skin before applying the electrode.

ELECTRODE APPLICATION

- Light and thin electrodes are placed with a gauze pad under the hub to lessen the pressure exerted on the skin and secured to the patient's scalp with collodion.
- Excess collodion is to be avoided to decrease itchy skin.
- Stretch-net is placed on the patient's head covering the electrodes loosely allowing 2 fingers to fit underneath.
- The stretch-net is not taped to the patient's head and no material is to be wrapped around the patient's head.

SKIN SAFETY CHECKS

- All electrodes are maintained with daily checks and skin checks.
- Skin and maintenance checks are documented into patient's chart and onto a worksheet for the technologists to follow.

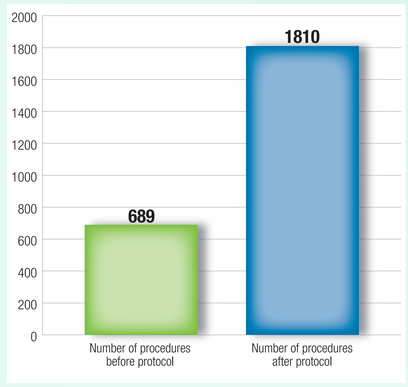
Going beyond ASET guidelines, the committee mandated the following critical changes:

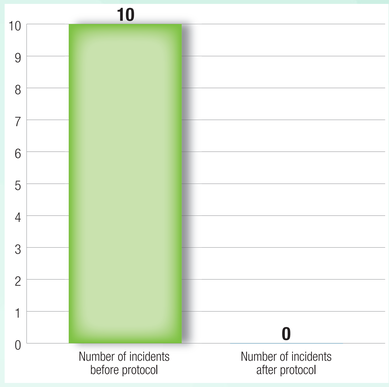
CRITICAL CHANGES IN OUR PROTOCOL

- Disposable leads for any patient under 12 months of age in addition to the ASET guidelines advising to consider disposable electrodes for use in critically ill patients.
- Electrode replacement every 72 hours for adults and 48 hours for pediatrics versus ASET guidelines indicating that the electrode site should be cleaned and the electrode moved away from the original site.
- Tape is only permitted over eye leads and T1/T2 electrodes and is replaced daily (as well as EKG leads) rather than ASET guidelines discouraging non-breathable tape.

RESULTS

As shown below, following implementation of the Skin Safety Protocol in September 2016, the number of reported skin breakdown incidents decreased from 10 out of 689 in the time period from January, 2016 to September, 2016 to 0 out of 1810 in the period from September, 2016 to March , 2018 . Thus, there have been none reported in the 19 months since this process improvement was initiated in September 2016.





CONCLUSIONS

Implementation of the LVHN Skin Safety Protocol has had a positive impact on skin breakdown incidences related to extended EEG procedures. This important ASET Skin Safety Guideline / LVHN Skin Safety Protocol can be replicated in other EEG labs to improve skin safety outcomes for Long-term/extended EEG procedures. Additional multi-centered, double-blind and vehicle-controlled research is needed to validate the critical points instrumented differently in our protocol from the ASET guidelines.

REFERENCES

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