

# Investigating Cuff Inflation Effects on Sleep Arousal and Sleep Stage Changes

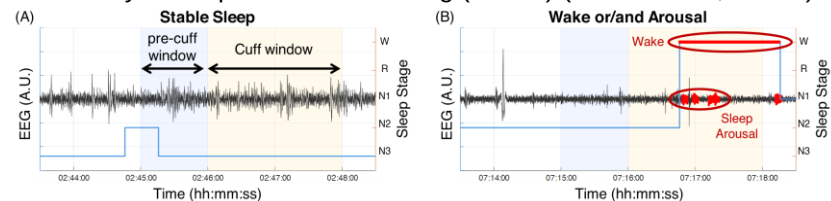
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This study used a dataset from Yilmaz et al., including 91 subjects who underwent two nights of polysomnography (PSG) with EEG (C3, C4), PPG, and ECG. On one randomly selected night, subjects underwent ambulatory blood pressure monitoring (ABPM) (Yilmaz et al., 2023a).



**Figure 1. Three response types during the cuff window with the EEG signal: (A) stable sleep, (B) wake or/and arousal**

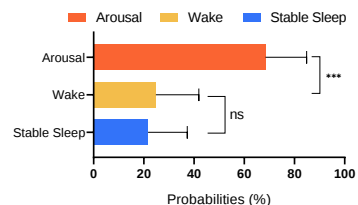
Only ABPM-night data were analyzed. For each measurement, a cuff-effect window was defined as two epochs before and after the event. A pre-cuff (one-epoch) excluded whether is with arousal or wake.

Sleep stages were obtained from annotations. As arousal labels were unavailable, an EEG-based detection algorithm based on AASM criteria (Berry et al., 2012; Chylinski et al., 2020) was applied to NREM sleep. Events occurred the REM sleep in the pre-cuff too.

Subjects with at least five valid events were included. EEG response types were categorized as stable sleep, arousal, or wake (Fig. 1), and proportions were calculated.

Two paired t-tests compared arousal and wake relative to stable sleep (Fig. 2). Arousal proportion was significantly higher after cuff inflation, whereas wake was not significantly different.

These findings suggest that cuff inflation during ABPM may trigger transient arousal during sleep.



**Figure 2. Bar chart of the proportions of cuff response types (\*p <.05, \*\*p<.01, \*\*\*p<.001)**