

## E-supplement for the original article:

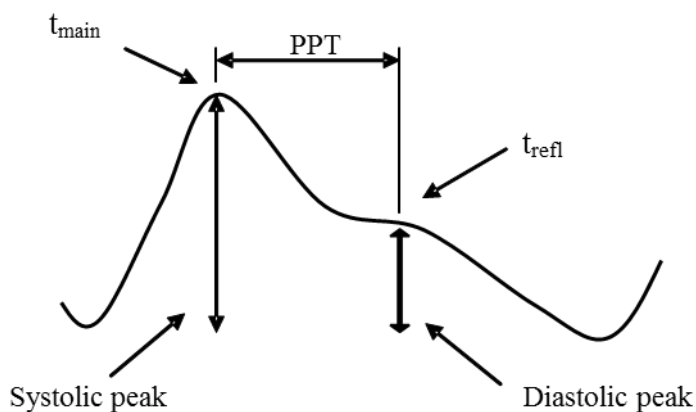
### REM sleep imposes a vascular load in COPD patients independent of sleep apnea

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Methods: Information related to the ethical approvals from the centers involved in the multicenter study.

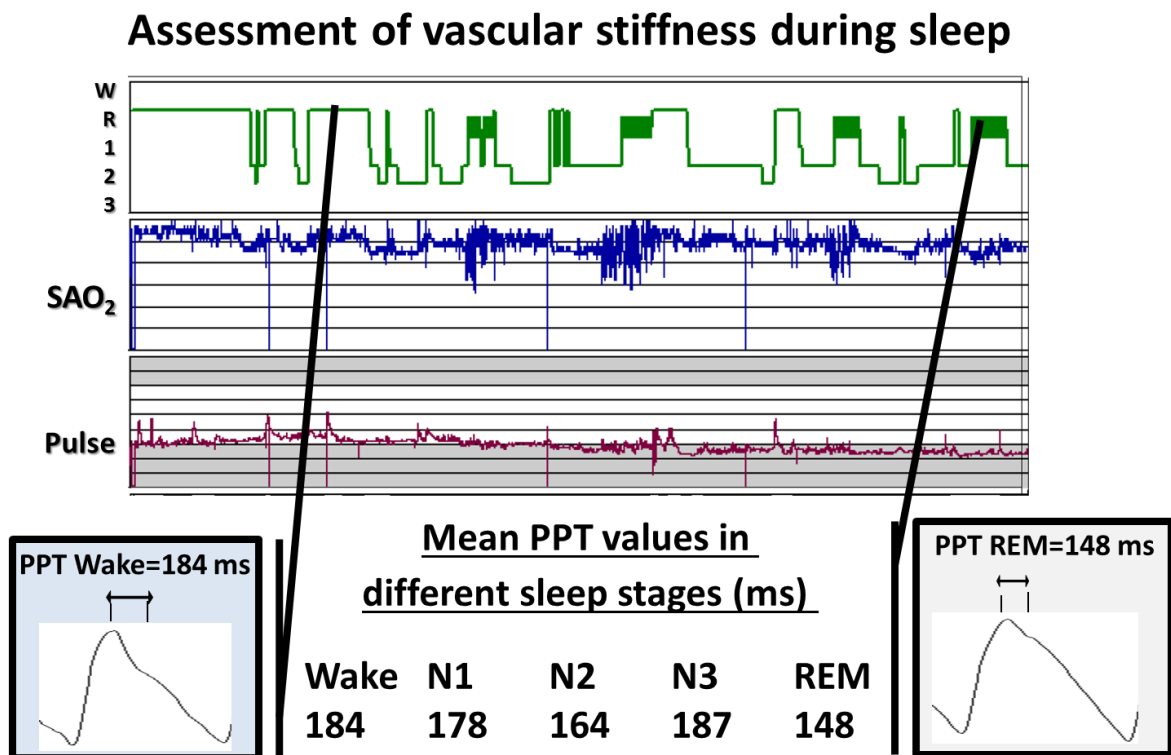
- Gothenburg: Regional Etikprövningsnämnden (EPN) Göteborg: No 415-09
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- Nuremberg: Ethikkommission der Friedrich-Alexander-Universität Erlangen-Nürnberg, No. 4219-CH, 4.5.2010
- Solingen: Ethikkommission der Universität Witten/Herdecke e.V., no 14/2010

**Figure 1 E-supplement:** Analysis of Pulse Propagation Time (PPT) from the digital pulse wave. The calculation formula is  $PPT = t_{refl} - t_{main}$ .



**Figure 2, e-supplement**

Recording example in one patient with COPD. Mean PPT was calculated for wakefulness and the different sleep stages N1, N2, N3, and REM. The two windows from wakefulness and REM sleep show one typical pulse curve and the method of PPT calculation applied in the study.



**Figure 3, e-supplement**

Illustrated are the variations of Pulse Propagation Time (PPT, ms, y-axis, upper red error bars) and Time SaO<sub>2</sub><90% (T<90%, z-axis, lower green error bars) during wakefulness and the different sleep stages. Shown are means  $\pm$  standard error of the mean for matched COPD patients (n=12, right figure) and for matched non-COPD Controls (n=12, left figure). The within-group differences in T<90% between the sleep stages N1 to REM were not significant in both groups. PPT (=inverse arterial stiffness) increased significantly during NREM sleep in the controls and decreased significantly in REM sleep in COPD patients when compared with wakefulness.

