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Title: Forensic oximetry: Is it possible to confirm that the same patient has worn an oximeter on 2 nights?

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Body: Introduction: We suspected a patient had performed home oximetry on their partner as they did not wish to receive treatment or be stopped from driving due to their obstructive sleep apnoea hypopnoea syndrome (OSAHS). We wanted to see if it was possible to recognise a pulse rate "fingerprint" in patients who had performed two consecutive sleep studies. We wanted to determine the normal variation in pulse rate (PR) on 2 nights in the same subject. The mean PR or the SD of the PR should be close enough to tell that the same patient is using the device. Method: We reviewed mean and standard deviation (SD) of the pulse rates recorded during routine overnight oximetry and a multi-channel study in 37 patients [17F:20M Mean (SD); Age 50.8 (13.9) years;) with suspected OSAHS 16.4 (28.4) >4% dips per hour.] 37% of patients had confirmed OSAHS. Results: The results (Table 1) show that mean difference in heart rate was 3.5 bpm (+/- 7.1) and that statistically there was no little difference between the 2 nights. However, analysis by Bland & Altman (Fig 1) shows that the variation in pulse rate was 9-12%.

Table 1

	Night 1	Night 2	Diff*
Mean PR	63.9	67.4	3.5 +/- 7.1
SD PR	7.3	7.8	0.5 +/- 3.0
COV % PR	9.0 +/- 3.0	10.0 +/- 2.0	7.0 +/- 36.0

*Values shown as Mean (SD) No significant difference were found between Nights 1 & 2

Discussion: The variation in pulse rate between any two oximetry studys is on average 10% or between +/-7 bpm difference in the mean PR. However, 3 out of 37 patients had greater variation than this. Conclusion: It is not possible on an individual basis to confirm if the same patient has performed an oximetry study. We have shown the expected normal range in PR for the same patient.