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MICROSENSOR TECHNOLOGY TO MONITOR COMPLIANCE WITH REMOVABLE ORAL APPLIANCES

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Objective: The aim of this study is to evaluate the reliability of thermo-sensitive microsensors which record "wear-time" of removable OA and help clinicians evaluate patient adherence.

Methods: DentiTrac (Sensor D, n=16), TheraMon (Sensor T, n=20) and Air-Aid Sleep microsensors (Sensor A, n=30) placed in a water bath (34-380C) to simulate "wear-time" of OA. In trial 1, sensors were in the water bath for 7 hours/day. In trial 2, sensors were in the water bath for 2 hours, removed for 1 hour, and replaced for 2 hours/day. In trial 3, the sensors were embedded into 3 different materials, acrylic, polyvinylchloride, and thermoactive acrylic and were placed into the water bath for 7 hours/day. Each trial was conducted for 10 days.

Results: In trial 1, there was no significant difference between the actual log time and the computed time readouts for Sensor T (0.90 ± 12.37 min/day) and Sensor A (-0.42 ± 4.69 min/day). Sensor D significantly overestimated time (3.53 ± 2.42 min/day) during long durations of "wear". In trial 2, there was no significant difference between the actual log time and the computed time for Sensor T (0.15 ± 3.00 min/day). Sensor A significantly underestimated time (3.67 ± 9.34 min/day) and Sensor D significantly overestimated time (8.34 ± 3.62 min/day) during short durations of "wear". In trial 3, only Sensors D computed readout were significantly different depending on the material.

Conclusion: All 3 microsensors are comparable in their accuracy. While some statistically significant differences were found between the microsensors, clinically these differences are not significant. All 3 materials are suitable to be used with these microsensors in clinical settings.