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Title: Continuous pulse oximetry in the breath-hold diving women of Korea and Japan

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Abstract: Arterial oxygen saturation during breath-hold diving has not previously been measured continuously. We devised a submersible, waterproof, backpack computer to continuously record heart rate, depth, and arterial oxygen saturation (SPO₂) as determined by earlobe pulse oximetry. Our measurements showed that one assisted (Funado) diver had reduced SPO₂ values immediately after surfacing from 22 dives which lasted 23-76 s, from a mean of 99 +/- 1% SPO₂ to 96 +/- 3% SPO₂. SPO₂ returned to 97 +/- 2% within 15 s after surfacing (P < 0.05 surface value differs from pre-dive base line). Four unassisted (Cachido) divers showed no significant reduction of mean pre-dive SPO₂ below 98 +/- 2% at any time during the dive or recovery period in 92 routine dives lasting from 15 to 44 s. Upon surfacing from diving, mean SPO₂ was 98 +/- 2% and the mean SPO₂ 15 s after surfacing was 97 +/- 3% for the unassisted divers. Three Cachido divers were asked to dive and breath hold for as long as possible. Mean SPO₂ at the conclusion of breath holding was 73% after an average dive and breath hold lasting 69 s.

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