

COVID-19 has significantly impacted on diving operations globally. After initial major concerns about long term impact on diver health, 2022 has restored some sanity to assessment of divers seeking to return to diving after COVID-19. Australia and New Zealand have highly vaccinated populations and the omicron strain has proven less pathogenic but more infectious than previous strains. The South Pacific Underwater Medicine Society (SPUMS) first posted guidelines for return to diving after COVID on its website in March 2022 (<https://www.spums.org.au/content/covid-19-updates>). Before January 2022, there was minimal need for COVID-19 diving guidance in Australia and New Zealand because both countries had been isolated. After opening up, a dramatic rise in locally acquired infections necessitated guidance for members. A pragmatic approach was initially taken, using some key references from other groups.¹⁻³ However, SPUMS processes allowed for greater doctor discretion than procedures from the northern hemisphere which required high rates of mandated imaging and exercise testing. A management flowchart, COVID questionnaire and medical certificate were made available to SPUMS members in March 2022.

The author reports a quality assurance review of a single practice, following SPUMS guidance, which supports the category of ‘very mild COVID illness’ as being apparently low risk and having minimal impact on diver health and fitness. Sixty occupational divers, 52 male, eight female, mean age 33.1 years were assessed 2–4 weeks post-COVID over three months from 1 January 2022. Thirty-four had two vaccinations, 26 were triple vaccinated. Divers were assessed for suitability for returning to occupational diving using SPUMS guidance. At the time of these assessments the SPUMS ‘mild’ COVID-19 illness criteria required a pre-return-to-diving face-to-face medicine consultation after recovery including spirometry and measurement of peripheral oxygen saturation (S_pO_2) but imaging was not undertaken if spirometry was stable (when compared to the diver’s most recent pre-COVID measurement).

Subsequently, these divers were retrospectively assessed against the ‘very mild COVID illness’ criteria promulgated by Sadler et al., on 31 March 2022,⁴ and embraced in modified SPUMS guidelines promulgated in June 2022.⁵ These criteria are:

1. Completed mandatory isolation (7 days), asymptomatic when assessed;

2. Symptoms < 7 days, solely outpatient management, no oxygen requirement;
3. No lower respiratory symptoms – no dyspnoea or productive cough; (but myalgia, headache, fever or fatigue were allowable);
4. Return to former full exercise capacity.

Fifty-seven of the 60 divers met the very mild criteria, had stable spirometry parameters (not $\geq 5\%$ reduction) since the last medical and had an $S_pO_2 \geq 96\%$ at the time of the post-COVID diving consultation. All successfully returned to diving at one month. All divers continued to successfully dive through to three months post clearance. Direct return for review by the author was required if divers experienced difficulties after returning to diving but none were reported. No health issues were reported during telephone follow-up with dive supervisors to three months. Analysis of FEV_1 , FVC and ratios measured at the post-COVID pre-diving consultation and compared to the most recent pre-COVID measurements revealed no significant difference for the population (t -test = NS). Correlation was linear for pre- and post-COVID measurements with coefficients of 1.0 ± 0.02 for FVC and 1.0 ± 0.006 for FEV_1 .

Three divers (5%) had delayed return to diving. Two had persistent respiratory symptoms at the 4-week review, both had spirometry impairment 5–10%, but $S_pO_2 \geq 96\%$. Both became asymptomatic had normal clinical examinations and spirometry normalised by two months. No imaging was undertaken for these divers. It is acknowledged that other authors may not agree with this approach, and may mandate imaging.⁶ One diver had chest pain and was cleared at two months after normal echocardiography, ECG and biochemistry. None of these delayed divers met the ‘very mild’ classification.

This quality assurance review supports the recent guideline update incorporating a ‘very mild’ category for COVID-illness.⁴ In vaccinated individuals COVID-19 is having less impact on divers than was initially feared, and this has resulted in introduction of the very mild classification. However, the data cannot be extrapolated to unvaccinated divers.

SPUMS has now updated its guidelines to permit clearance of divers who satisfy ‘very mild’ COVID illness criteria at two weeks, using a telephone questionnaire administered

by the diving doctor.^{5,6} The most recent iterations of DMAC-33 (Rev.4 – June 2022) and Sadler's group broadly agree with SPUMS in accepting classifications of milder COVID illness.^{2,4} This report contrasts with the much higher rates of detection of pathology by Mirasoglu et al.⁶ Further research is required in this evolving diver health issue.

References

- 1 Sadler C, Alvarez-Villela M, Van Hoesen K, Grover I, Lang M, Neuman T, et al. Diving after SARS-CoV-2(COVID-19) infection: Fitness to dive assessment and medical guidance. *Diving Hyperb Med.* 2020;50:278–87. doi: [10.28920/dhm50.3.278-287](https://doi.org/10.28920/dhm50.3.278-287). PMID: [32957131](https://pubmed.ncbi.nlm.nih.gov/32957131/). PMCID: [PMC7755459](https://pubmed.ncbi.nlm.nih.gov/PMC7755459/).
- 2 Diving Medical Advisory Committee. Return to diving after COVID-19. DMAC 33 Rev.2 – December 2021. London, UK: Diving Medical Advisory Committee. [cited 2022 Jan 05]. Available from: <https://www.dmac-diving.org/guidance/DMAC33.pdf>.
- 3 Société Belge de Médecine Hyperbare et Subaquatique. Position of the Belgian Society for diving and hyperbaric medicine (SBMHS-BVOOG) on diving after Covid-19 pulmonary infection [18.10.2021]. [cited 2022 Jul 25]. Available from: <http://www.sbmhs.be/2020%200412%20Position%20of%20the%20BVOOG.pdf>.
- 4 Sadler C, Alvarez-Villela M, Van Hoesen K, Grover I, Lang M, Neuman T, et al. Diving after COVID-19: an update to fitness to dive assessment and medical guidance. *Diving Hyperb Med.* 2022;52:66–7. doi: [10.28920/dhm52.1.66-67](https://doi.org/10.28920/dhm52.1.66-67). PMID: [35313377](https://pubmed.ncbi.nlm.nih.gov/35313377/). PMCID: [PMC9016139](https://pubmed.ncbi.nlm.nih.gov/PMC9016139/).
- 5 Smart D, Elliott E, Lockley S. Occupational/recreational diver clearance post COVID illness. [cited 2022 Jul 25]. Available from: https://spums.org.au/sites/default/files/2022-06-30FLOWCHART-COVID-GUIDELINES-SPUMS_Vrsn2_June%202022.pdf.
- 6 Mirasoglu B, Yetis G, Erelel M, Toklu AS. Post COVID-19 fitness to dive assessment findings in occupational and recreational divers. *Diving Hyperb Med.* 2022;52:35–43. doi: [10.28920/dhm52.1.35-43](https://doi.org/10.28920/dhm52.1.35-43). PMID: [35313371](https://pubmed.ncbi.nlm.nih.gov/35313371/). PMCID: [PMC9177431](https://pubmed.ncbi.nlm.nih.gov/PMC9177431/).

Submitted: 25 July 2022

Accepted after revision: 10 August 2022

doi: [10.28920/dhm52.3.222-223](https://doi.org/10.28920/dhm52.3.222-223). PMID: [36100936](https://pubmed.ncbi.nlm.nih.gov/36100936/).

David Smart

Department of Diving and Hyperbaric Medicine, Royal Hobart Hospital, 26 Campbell St, Hobart, Tasmania 7000, Australia

Address for correspondence: *Clinical Professor David Smart, iN2Deep Medical Consulting, GPO Box 463, Hobart, Tasmania 7001, Australia.*

dsmart@iinet.net.au

Keywords

Diving Medicine; Health surveillance; Medicals-diving; SARS-CoV-2; Lung function

Copyright: This article is the copyright of the author who grants *Diving and Hyperbaric Medicine* a non-exclusive licence to publish the article in electronic and other forms.