

## Letters to the editors



### MORE ON SCUBA DIVING AND BLEOMYCIN

To the editors:

144,000 hits on Google for the two words “bleomycin” and “scuba” demonstrate the continued interest in the subject of diving after bleomycin therapy; some very conservative, and some more liberal regarding recommendations. My thanks to *UHM*, which published “Scuba diving post-bleomycin therapy” (*UHM* 2010, Vol. 37, No. 6, p. 455), documenting a recreational diver’s return to scuba after his chemotherapy with bleomycin. The article focused on objective evidence in the form of pulmonary function tests, and I wanted to update that information with another set of data points,

as recorded in the accompanying table, eight years after chemotherapy and five years after returning to depths of 90 feet. Since 2010 the now 61-year-old index diver has done an additional 154 dives ranging from 37 to 137 feet (average 63 feet), all on air (no nitrox).

I again call on the medical community to perform large-scale studies to develop parameters that would allow divers to safely return to scuba post-bleomycin therapy.

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### FOR ADDITIONAL INFORMATION . . .

in *UHM* on scuba diving after bleomycin therapy, see “Safe administration of hyperbaric oxygen after bleomycin: A case series of 15 patients” by Klaus D. Torp, Martha Sue Carraway, Michael C. Ott, Bryant W. Stolp, Richard E. Moon, Claude A. Piantadosi and John J. Freiberger, which appeared in the September-October 2012 issue, Vol. 39 issue 5, p. 873-879.

— *Editors*

Date	SVC (in L)	percent predicted	FEV1 (in L)	percent predicted	DLCO (ml/min/mmHg)	percent predicted
10/04/2006 Baseline	5.46	104	4.52	120	41.92	115
10/23/2006	5.86	112			31.37	86
11/13/2006	5.96	114			31.17	86
11/28/2007	5.87	113	4.7	126	31.21	86
08/06/2008	6.26	121	4.96	134	35.39	97
02/20/2009	6.06	117	4.81	132	31.89	88
01/08/2010	6.12	119	4.89	133	30.92	85
07/01/2014	5.73	112			36.21	103

### OXYGEN TOXIC SEIZURES DURING HYPERBARIC OXYGEN THERAPY

To the editors:

I have concerns about the recent report by Heyboer, *et al.*, reporting their experience with oxygen toxic seizures among patients undergoing hyperbaric oxygen therapy [1]. They report an overall incidence of seizure at one in 2,121 treatments, based upon zero in 16,430 treatments at 2.0 atmospheres absolute (atm abs), 10 in 6,700 treatments at 2.4/2.5 atm abs, and one in 198 treatments at 2.8 atm abs.

The authors claim that their incidence of one seizure in 2,121 treatments is similar to prior reports by Welslau [2] and Pflaki [3], reportedly demonstrating rates of one in 1,800 treatments and one in 2,844 treatments, respectively. It is correct that Welslau reported two seizures in 3,603 treatments delivering 60 consecutive minutes of oxygen without air breaks at 2.5-2.6 atm abs, for a rate of one in 1,802 treatments. However, Heyboer and co-authors appear to have chosen to report this subgroup of Welslau’s patients with a seizure incidence similar to their own experience, even though they treated no patients on this protocol.

In the Welslau paper, seizure incidences of one in 3,725 treatments delivering 90 minutes of oxygen at 2.4 atm abs in three 30-minute periods with two air breaks and one in 9,358 treatments delivering 60 minutes of oxygen at 2.5 atm abs in two 30-minute periods with one air break were also reported. Heyboer, *et al.* derived the incidence of one seizure in 2,121 treatments from their combined treatment experience using all protocols. Welslau's seizure incidence when combining all protocols was 16 in 107,264 treatments, for a rate of one in 6,704 treatments, one-third that of Heyboer.

Second, Heyboer and colleagues claim that their report is "one of the few to demonstrate a statistically significant increased risk of oxygen toxic seizure at higher treatment pressures." To my knowledge, oxygen toxic seizures have never been reported during routine treatments performed at 2.0 atm abs. It is not surprising that the incidence was 0% in this group. Since 98% of their treatments performed at 2.8 atm abs were for emergent indications and 87% of their emergency treatments were for carbon monoxide poisoning, a higher seizure incidence for these patients with acute brain injury than for patients receiving routine treatments performed at 2.4 atm abs also should not be surprising. We reported this over a decade ago [4,5].

My third and greatest concern relates to the fact that the seizure incidence in Heyboer's population could be anywhere close to that reported by others who did not include any 2.0 atm abs treatments in their study populations. Heyboer's population is diluted by 70% of these patients with no risk for seizure, suggesting that they must have seen an extremely high incidence of seizure in other subgroups. In fact, he reports a seizure incidence of one in 231 among patients treated at 2.4/2.5 atm abs and receiving 90 minutes of oxygen in three 30-minute periods with two air breaks. This rate is unheard of in the literature and is the protocol for which seizure incidences of one in 3,725 treatments was reported by Welslau, one in 2,844 by Pflaki, and one in 3,388 by our group [5]. How do the authors explain a rate of CNS oxygen toxicity over 15-fold greater for the protocol used most often to treat patients with routine indications in multiplace chambers in the U.S.?

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## References

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## RESPONSE :

### OXYGEN TOXIC SEIZURES DURING HYPERBARIC OXYGEN THERAPY

*To the editors:*

We would like to thank Dr. Hampson for his carefully crafted and detailed letter. As he implies, the hyperbaric research field is often confused by differences in protocol specification, application methodologies, and the interpretation and implications of research findings. As we all continue to develop the hard data research framework we look forward to working with Dr. Hampson and others to continually clarify investigative findings, to place the findings in proper context, and to grow the necessary evidence clearly demonstrating the medical advantages of hyperbaric therapy.

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