

Search Rubicon

[Advanced Search](#)

[Home](#)

Browse

[Communities & Collections](#)

[Titles](#)

[Authors](#)

[By Date](#)

Sign on to:

[Receive email updates](#)

[My Rubicon](#)
authorized users

[Edit Profile](#)

[Help](#)

[Rubicon Research Repository](#) >
[Rubicon Foundation Archive](#) >
[Undersea and Hyperbaric Medicine Journal](#) >

Please use this identifier to cite or link to this item:

<http://archive.rubicon-foundation.org/2187>

Title: Does the time course of bubble evolution explain decompression sickness risk?

Authors: Ball, R
Himm, J
Homer, LD
Thalmann, ED

Keywords: decompression
linear exponential
model
human
air
nitrox
bubble

Issue Date: 1995

Abstract: A probabilistic model of decompression sickness (DCS) risk based on linear-exponential (LE) kinetics has given the best fit of the human air and nitrox DCS database. To test the hypothesis that its success may be due to the formation of a gas phase during decompression, we developed a physiologically based bubble evolution model using a numerical solution of a partial differential equation system. Because of the computational intensity of this method, it could not be used to fully explore our hypothesis. Consequently, we compared the solution with that of a computationally simpler approximation that was previously published by Van Liew and found the two approaches gave similar results. Using the simpler model, assuming bubble densities of 1 and 1,000 bubbles/cm³, we found a tissue time constant of at least 80 min (equivalent to perfusion of 1/80 ml.g⁻¹.min⁻¹) was required to achieve a delay in bubble dissolution comparable to the prolonged risk of DCS predicted by the LE model. We suggest that the persistence of single bubbles in a uniformly perfused homogeneous tissue alone is unlikely to explain persistent DCS risk.

Description: Undersea and Hyperbaric Medical Society, Inc.
(<http://www.uhms.org>)

URI: [PMID: 7580767](https://pubmed.ncbi.nlm.nih.gov/7580767/)

Appears in Collections: [Undersea and Hyperbaric Medicine Journal](#)

Files in This Item:

File	Size	Format	
7580767.pdf	2686Kb	Adobe PDF	View/Open

[Show full item record](#)

All items in DSpace are protected by copyright, with all rights reserved.