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Title: Pressure-reduction limits for rats following steady-state exposures between 6 and 60 ATA

Authors: Berghage, TE
Gomez, JA
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Abstract: The role of pressure reduction in the formation and growth of bubbles is universally recognized and its significance in decompression theory has been accepted. Yet the allowable limits of pressure reduction for man and animal are uncertain. This study sought to evaluate the pressure-reduction limits for rats following steady-state exposures at pressures greater than 1 atm. To define the relationship, 350 albino rats were exposed to 1 of 12 specified pressure levels between 6 and 60 ATA and then abruptly decompressed to a preselected reduced pressure level for observation. The pressure-reduction levels were selected to determine for each saturation-exposure level an ED-50 (i.e. the effective dose that will produce decompression sickness in 50 percent of the animals). The results demonstrate three consistent findings: (1) there is a linear relationship ($r = .99$) between the magnitude of a safe pressure reduction and the saturation exposures between 6 and 43 ATA; (2) at pressures greater than 43 ATA, there is a qualitative change in the decompression sickness symptoms and a reduction in the precision of the mathematical relationship ($r = .44$); and (3) the magnitude of the pressure change required to increase the incidence of decompression sickness from 10percent to 90percent is directly related to the magnitude of the exposure pressure. The implications of these results for deep operational diving are discussed. Animals Atmosphere Exposure Chambers *Atmospheric

Pressure *Decompression Sickness Disease Models,
Animal Male Rats Support, U.S. Gov't, Non-P.H.S.

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