CHAPTER 21

Hyperbaric Oxygen Therapy

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REFERENCES

1. Weaver LK (ed): Section II, hyperbaric oxygen: definition, in *Undersea and Hyperbaric Medical Society Hyperbaric Oxygen Therapy Indications,* 13th ed. North Palm Beach, FL: Best Publishing Company; 2014.
2. Thom SR: Hyperbaric oxygen: its mechanisms and efficacy. *Plast Reconstr Surg* 127 (Suppl) 1: 131S, 2011. [PMID: 21200283]
3. Tepic S, Petkovic A, Srejovic I, et al: Impact of hyperbaric oxygenation on oxidative stress in diabetic patients. *Undersea Hyper Med* 45: 9, 2018. [PMID: 29571227]
4. Camporesi EM, Bosco G: Mechanisms of action. In: Weaver LK (ed): *Undersea and Hyperbaric Medical Society Hyperbaric Oxygen Therapy Indications,* 13th ed. North Palm Beach, FL: Best Publishing Company; 2014:241-246.
5. Weaver LK (ed): *Undersea and Hyperbaric Medical Society Hyperbaric Oxygen Therapy Indications,* 13th ed. North Palm Beach, FL: Best Publishing Company; 2014.
6. Massey EW, Moon RE: Neurology and diving. *Handb Clin Neurol* 120: 959, 2014. [PMID: 24365363]
7. Sila C: Neurologic complications of cardiac tests and procedures. *Handb Clin Neurol* 119: 41, 2014. [PMID: 24365287]
8. Kim CS, Liu J, Kwon JY, Shin SK, Kim KJ: Venous air embolism during surgery, especially cesarean delivery. *J Korean Med Sci* 23: 753, 2008. [PMID: 18955777]
9. Muth CM, Shank ES: Gas embolism. *N Eng J Med* 342: 476, 2000. [PMID: 10675429]
10. Moon RE: Air or gas embolism. In: Weaver LK (ed): *Undersea and Hyperbaric Medical Society Hyperbaric Oxygen Therapy Indications,* 13th ed. North Palm Beach, FL: Best Publishing Company; 2014:1-9.
11. McCarthy CJ, Behravesh S, Naidu SG, Oklu R: Air embolism: diagnosis, clinical management and outcomes. *Diagnostics (Basel)* 7: 5, 2017. [PMID: 28106717]
12. Mirski MA, Lele AV, Fitzsimmons L, Toung TJ: Diagnosis and treatment of vascular air embolism. *Anesthesiology* 106: 164, 2007. [PMID: 17197859]
13. Niyibizi E, Kembi GE, Lae C, Pignel R, Sologashvili T: Delayed hyperbaric oxygen therapy for air emboli after open heart surgery: case report and review of a success story. *J Cardiothorac Surg* 11: 167, 2016. [PMID: 27919270]
14. Wherrett CG, Mehran RJ, Beaulieu MA: Cerebral arterial gas embolism following diagnostic bronchoscopy: delayed treatment with hyperbaric oxygen. *Can J Anaesth* 49: 96, 2002. [PMID: 11782337]
15. Bitterman H, Melamed Y: Delayed hyperbaric treatment of cerebral air embolism. *Isr J Med Sci* 29: 22, 1993. [PMID: 8454441]
16. Moon RE: Decompression sickness. In: Weaver LK (ed): *Undersea and Hyperbaric Medical Society Hyperbaric Oxygen Therapy Indications*, 13th ed. North Palm Beach, FL: Best Publishing Company; 2014:105-112.
17. Bennett MH, Lehm JP, Mitchell SJ, Wasiak J: Recompression and adjunctive therapy for decompression illness. *Cochrane Database Syst Rev* 5: CD005277, 2012. [PMID: 22592704]
18. Murphy-Lavoie H, Butler F, Hagan C: Central retinal artery occlusion. In: Weaver LK (ed): *Undersea and Hyperbaric Medical Society Hyperbaric Oxygen Therapy Indications,* 13th ed. North Palm Beach, FL: Best Publishing Company; 2014:11-23.
19. Beiran I, Reissman P, Scharf J, Nahum Z, Miller B: Hyperbaric oxygenation combined with nifedipine treatment for recent-onset retinal artery occlusion. *Eur J Ophthalmol* 3: 89, 1992. [PMID: 8353436]
20. Murphy-Lavoie H, Butler F, Hagan C: Central retinal artery occlusion treated with oxygen: a literature review and treatment algorithm. *Undersea Hyperb Med* 39: 943, 2012. [PMID: 23045923]
21. Haberkamp TJ, Tanyeri HM: Management of idiopathic sudden sensorineural hearing loss. *Am J Otol* 20: 587, 1999. [PMID: 10503580]
22. LeGros TL, Murphy-Lavoie H: Idiopathic sudden sensorineural hearing loss. In: Whelan HT, Kindwall EP (eds): *Hyperbaric Medicine Practice*, 4th ed. North Palm Beach, FL: Best Publishing; 2017:325-360.
23. Bennett MH, Kertesz T, Perleth M, Yeung P, Lehm JP: Hyperbaric oxygen for idiopathic sudden sensorineural hearing loss and tinnitus. *Cochrane Database Syst Rev* 10: CD004739, 2012. [PMID: 23076907]
24. Murphy-Lavoie H, Piper S, Moon RE, LeGros T: Hyperbaric oxygen therapy for idiopathic sudden sensorineural hearing loss. *Undersea Hyperb Med* 39: 777, 2012. [PMID: 22670557]
25. Stachler R, Chandrasekhar S, Archer S, at al: Clinical practice guidelines: sudden hearing loss. *Otolayrngol Head Neck Surg* 146: S1, 2012. [PMID: 22383545]
26. Van Meter KW: The effect of hyperbaric oxygen on severe anemia. *Undersea Hyperb Med* 39: 937, 2012. [PMID: 23045922]
27. Amonic RS, Cockett AT, Lorhan PH, Thompson JC: Hyperbaric oxygen in chronic hemorrhagic shock. *JAMA* 208: 2051, 1969. [PMID: 5305672]
28. Hart GB: Exceptional blood loss anemia. Treatment with hyperbaric oxygen. *JAMA* 228: 1028, 1974. [PMID: 4406342]
29. McLoughlin P, Cope T, Harrison J: Hyperbaric oxygen therapy in the management of severe acute anaemia in a Jehovah's witness. *Anaesthesia* 54: 879, 1999. [PMID: 10460565]
30. Myking O, Schreiner A: Hyperbaric oxygen in hemolytic crisis. *JAMA* 227: 1161, 1974. [PMID: 4405898]
31. Van Meter KW: Severe anemia. In: Weaver LK (ed): *Undersea and Hyperbaric Medical Society Hyperbaric Oxygen Therapy Indications*, 13th ed. North Palm Beach, FL: Best Publishing Company; 2014:209-215.
32. Bouachour G, Cronier P, Gouello JP, Tolemonde JL, Talha A, Alquier PH: Hyperbaric oxygen therapy in the management of crush injuries: a randomized double-blind placebo-controlled clinical trial. *J Trauma* 41: 333, 1996. [PMID: 8760546]
33. Strauss MB: Crush injuries and skeletal muscle-compartment syndromes. In: Weaver LK (ed): *Undersea and Hyperbaric Medical Society Hyperbaric Oxygen Therapy Indications,* 13th ed. North Palm Beach, FL: Best Publishing Company; 2014:91-103.
34. Strauss MB: The effect of hyperbaric oxygen in crush injuries and skeletal muscle-compartment syndromes. *Undersea Hyperb Med* 39: 847, 2012. [PMID: 22908841]
35. Strauss MB, Hargens AR, Gershuni DH, et al: Reduction of skeletal muscle necrosis using intermittent hyperbaric oxygen in a model compartment syndrome. *J Bone Joint Surg Am* 65: 656, 1983. [PMID: 6853571]
36. Strauss MD: Cost-effective issues in hyperbaric oxygen therapy: complicated fractures (editorial). *J Hyperb Med* 3: 199, 1988.
37. Imray C, Grieve A, Dhillon S, The Caudwell Xtreme Everest Research Group: Cold damage to the extremities: frostbite and non-freezing cold injuries. *Postgrad Med J* 85: 481, 2009. [PMID: 19734516]
38. Kemper TC, de Jong VM, Anema HA, van den Brink A, van Hulst RA: Frostbite of both first digits of the foot treated with delayed hyperbaric oxygen: a case report and review of the literature. *Undersea Hyperb Med* 41: 65, 2014. [PMID: 24649719]
39. Baynosa RC, Zammboni WA: Compromised grafts and flaps. In: Weaver LK (ed): *Undersea and Hyperbaric Medical Society Hyperbaric Oxygen Therapy Indications,* 13th ed. North Palm Beach, FL: Best Publishing Company; 2014:77-90.
40. Eo S, Hur G, Cho S, Azari KK: Successful composite graft for fingertip amputations using ice-cooling and lipo-prostaglandin E1. *J Plast Reconstr Aesthet Surg* 62: 764, 2009. [PMID: 18407819]
41. Renner G, McClane SD, Early E, Bell P, Shaw B: Enhancement of auricular composite graft survival with hyperbaric oxygen therapy. *Arch Facial Plast Surg* 4: 102, 2002. [PMID: 12020204]
42. Marik V, Kurial P: Successful replantation of a completely amputated ear on a child. *Acta Chir Plast* 54: 19, 2012. [PMID: 23170943]
43. Bada AM, Pope GH: Use of hyperbaric oxygen as adjunct in salvage of near-complete ear amputation. *Plast Reconstr Surg Glob Open* pii: e1, 2013. [PMID: 2528915]
44. Cantarella G, Mazzola RF, Pagani D: The fate of an amputated nose after replantation. *Am J Otolaryngol* 26: 344, 2005. [PMID: 16137535]
45. Pou JD, Graham HD: Pediatric nasal tip amputation successfully treated with nonmicrovascular replantation and hyperbaric oxygen therapy. *Ochsner J* 17: 204, 2017. [PMID: 28638297]
46. Faydaci G, Ugur K, Osman C, Sermin S, Bilal E: Amputation of glans penis: a rare circumcision complication and successful management with primary anastomosis and hyperbaric oxygen therapy. *Korean J Urol* 52: 147, 2011. [PMID: 21379434]
47. Bejany DE, Perito PE, Lustgarten M, Rhamy RK: Gangrene of the penis after implantation of penile prosthesis: case reports, treatment recommendations and review of the literature. *J Urol* 150: 190, 1993. [PMID: 8510251]
48. Mydlo JH, Harris CF, Brown JG: Blunt, penetrating and ischemic injuries to the penis. *J Urol* 168: 1433, 2002. [PMID: 12352411]
49. Zhong Z, Dong Z, Lu Q, et al: Successful penile replantation with adjuvant hyperbaric oxygen treatment. *Urology* 69: 983.e3, 2007. [PMID: 17482954]
50. Rainer PP, Kaufmann P, Smolle-Juettner FM, Krejs CJ: Case report: hyperbaric oxygen in the treatment of puff adder (*Bitis arietans*) bite. *Undersea Hyperb Med* 37: 395, 2010. [PMID: 21226389]
51. Calhoun JH, Gogan WJ, Viegas SE, Mader JT: Treatment of high-pressure water gun injection injury of the foot with adjunctive hyperbaric oxygen: a case report. *Foot Ankle* 10: 40, 1989. [PMID: 2570010]
52. Cimsit M, Aktas S: Adjunctive hyperbaric oxygen therapy contributes healing in electrical injury: a case report of high voltage electrical injury. *Ulus Travma Acil Cerrahi Derg* 11: 172, 2005. [PMID: 15877252]
53. Burd F, Chiu T: Allogenic skin in the treatment of burns. *Clin Dermatol* 23: 376, 2005. [PMID: 16023933]
54. Grossman AR: Hyperbaric oxygen in the treatment of burns. *Ann Plast Surg* 1: 163, 1978. [PMID: 365048]
55. Wiseman DH, Grossman AR: Hyperbaric oxygen in the treatment of burns. *Crit Care Clin* 1: 129, 1985. [PMID: 3916774]
56. Waisbren BA, Schutz D, Collentine G, Banaszak E: Hyperbaric oxygen in severe burns. *Burns Incl Therm Inj* 8: 176, 1980. [PMID: 7059858]
57. Wada J, Ikeda T, Kamata K, Ebuoka M: Oxygen hyperbaric treatment for carbon monoxide poisoning and severe burn in coal mine (hokutanyubari) gas explosion. *Igakunoaymi (Japan)* 5: 53, 1965.
58. Hart GB, O'Reilly RR, Broussard ND, Cave RH, Goodman DB, Yanda RI: Treatment of burns with hyperbaric oxygen. *Surg Gynecol Obstet* 139: 693, 1974. [PMID: 4610853]
59. Grossman AR, Grossman AJ: Update on hyperbaric oxygen and treatment of burns. *Hyperbaric Oxygen Rev* 3: 51, 1982.
60. Cianci P, Lueders HW, Lee H, et al: Adjunctive hyperbaric oxygen therapy reduces length of hospitalization in thermal burns. *J Burn Care Rehabil* 10: 432, 1989. [PMID: 2793923]
61. Cianci P, Sato R, Green B: Adjunctive hyperbaric oxygen reduces length of hospital stay, surgery and the cost of care in severe burns. *Undersea Biomed Research Suppl* 18: 108, 1991.
62. Niu AKC, Yang C, Lee HC, Chen SH, Chang LP: Burns treated with adjunctive hyperbaric oxygen therapy: a comparative study in humans. *J Hyperbar Med* 2: 75, 1987.

63. Cianci P, Sato R: Adjunctive hyperbaric oxygen therapy in the treatment of thermal burns: a review. *Burns* 20: 5, 1994. [PMID: 8148076]
64. Cianci P, Lueders H, Lee H, et al: Adjunctive hyperbaric oxygen reduces the need for surgery in 40-80% burns. *J Hyperbar Med* 3: 97, 1988.
65. Cianci P, Slade JB Jr, Sato RM, Faulker J: Thermal burns. In: Weaver LK (ed): *Undersea and Hyperbaric Medical Society Hyperbaric Oxygen Therapy Indications,* 13th ed. North Palm Beach, FL: Best Publishing Company; 2014:91-103.
66. Weaver LK (ed): Carbon monoxide poisoning. In: *Undersea and Hyperbaric Medical Society Hyperbaric Oxygen Therapy Indications,* 13th ed. North Palm Beach, FL: Best Publishing Company; 2014:47-65.
67. Mathieu D, Marroni A, Kot J: Tenth European Consensus Conference on Hyperbaric Medicine: recommendations for accepted and non-accepted clinical indications and practice of hyperbaric oxygen treatment. *Diving Hyperb Med* 47: 24, 2017. [PMID: 28357821]
68. Weaver LK, Hopkins RO, Chan KJ, et al: Hyperbaric oxygen for acute carbon monoxide poisoning. *N Engl J Med* 347: 1057, 2002. [PMID: 12362006]
69. Thom SR, Taber RL, Mendiguren II, Clark JM, Hardy KR, Fisher AB: Delayed neuropsychologic sequelae after carbon monoxide poisoning: prevention by treatment with hyperbaric oxygen. *Ann Emerg Med* 25: 474, 1995. [PMID: 7710151]
70. Ballantyne B: Hydrogen cyanide as a product of combustion and a factor in morbidity and mortality from fires. In: Ballantyne B, Marrs T (eds): *Clinical and Experimental Toxicology of Cyanides*. Bristol, United Kingdom: John Wright; 1987:248.
71. Norris JC, Moore SJ, Hume AS: Synergistic lethality induced by the combination of carbon monoxide and cyanide. *Toxicology* 40: 121, 1986. [PMID: 3726889]
72. Pitt BR, Radford EP, Gurtner GH, Traystman RJ: Interaction of carbon monoxide and cyanide on cerebral circulation and metabolism. *Arch Environ Health* 34: 354, 1979. [PMID: 496432]
73. Skene WG, Norman JN, Smith G: Effect of hyperbaric oxygen in cyanide poisoning. In: Brown IW, Cox B (eds): *Proceedings of the Third International Congress on Hyperbaric Medicine*. Washington, DC: National Academy of Sciences, National Research Council; 1966:705.
74. Lawson-Smith P, Jansen EC, Hilsted L, Johnsen AH, Hyldegaard O: Effect of acute and delayed hyperbaric oxygen therapy on cyanide whole blood levels during acute cyanide intoxication. *Undersea Hyperb Med* 38: 17, 2011. [PMID: 21384760]
75. Lawson-Smith P, Olsen NV, Hyldegaard O: Hyperbaric oxygen therapy or hydroxycobalamin attenuates surges in brain interstitial lactate and glucose; and hyperbaric oxygen improves respiratory status in cyanide-intoxicated rats. *Undersea Hyperb Med* 38: 223, 2011. [PMID: 21877551]
76. Goodhart GL: Patient treated with antidote kit and hyperbaric oxygen survives cyanide poisoning. *South Med J* 87: 814, 1994. [PMID: 8052890]
77. Scolnick B, Hamel D, Woolf AD: Successful treatment of life-threatening propionitrile exposure with sodium nitrite/sodium thiosulfate followed by hyperbaric oxygen. *J Occup Med* 35: 577, 1993. [PMID: 8331438]
78. Hart GB, Strauss MB, Lennon PA, Whitcraft DD: Treatment of smoke inhalation by hyperbaric oxygen. *J Emerg Med* 3: 211, 1985. [PMID: 4093574]
79. Litovitz TL, Larkin RF, Myers RAM: Cyanide poisoning treated with hyperbaric oxygen. *Am J Emerg Med* 1: 94, 1983. [PMID: 6680611]
80. Trapp WG, Lepawsky M: 100% survival in five life-threatening acute cyanide poisoning victims treated by a therapeutic spectrum including hyperbaric oxygen. Paper presented at the First European Conference on Hyperbaric Medicine, Amsterdam, the Netherlands, 1983.
81. Mader J: Mixed anaerobic and aerobic soft tissue infections. In: Davis JC, Hunt TK (eds): *Problem Wounds: The Role of Oxygen.* New York: Elsevier; 1988.
82. Riseman JA, Zamboni WA, Curtis A, Graham DR, Konrad HR, Ross DS: Hyperbaric oxygen therapy for necrotizing fasciitis reduces mortality and the need for debridements. *Surgery* 108: 847, 1990. [PMID: 2237764]
83. Brown DR, Davis NL, Lepawsky M, Cunningham J, Kortbeek J: A multicenter review of the treatment of major truncal necrotizing infections with and without hyperbaric oxygen therapy. *Am J Surg* 167: 485, 1994. [PMID: 8185032]
84. Hollabaugh RS Jr, Dmochowski RR, Hickerson WL, Cox CE: Fournier's gangrene: therapeutic impact of hyperbaric oxygen. *Plast Reconstruct Surg* 101: 94, 1998. [PMID: 9427921]
85. Wilkinson D, Doolette D: Hyperbaric oxygen treatment and survival from necrotizing soft tissue infection. *Arch Surg* 139: 1339, 2004. [PMID: 15611459]
86. Escobar SJ, Slade JB Jr, Hunt TK, Cianci P: Adjuvant hyperbaric oxygen therapy (HBO2) for treatment of necrotizing fasciitis reduces mortality and amputation rate. *Undersea Hyperb Med* 32: 437, 2003. [PMID: 16509286]
87. Soh CR, Pietrobon R, Freiberger JJ, et al: Hyperbaric oxygen therapy in necrotizing soft tissue infections: a study of patients in the United States Nationwide Inpatient Sample. *Intensive Care Med* 38: 1143, 2012. [PMID: 22527074]
88. Shaw JJ, Psoinos C, Emhoff TA, Shah SA, Santry HP: Not just full of hot air: hyperbaric oxygen therapy increases survival in cases of necrotizing soft tissue infections. *Surg Infect (Larchmt)* 15: 328, 2014. [PMID: 24786980]
89. Devaney B, Frawley G, Frawley L, Pilcher DV: Necrotising soft tissue infections: the effect of hyperbaric oxygen on mortality. *Anaesth Intensive Care* 43: 685, 2015. [PMID: 26603791]
90. Jacoby IJ: Necrotizing soft tissue infections. In: Weaver LK (ed): *Undersea and Hyperbaric Medical Society Hyperbaric Oxygen Therapy Indications,* 13th ed. North Palm Beach, FL: Best Publishing Company; 2014.
91. Brown OR: Reversible inhibition of respiration of *Escherichia coli* by hyperoxia. *Microbios* 5: 7, 1972. [PMID: 4616140]
92. Hill GB, Osterhout S: Experimental effects of hyperbaric oxygen on selected clostridial species. I. In-vitro studies. *J Infect Dis* 125: 17, 1972. [PMID: 4332847]
93. Mader JT, Brown GL, Guckian JC, Wells CH, Reinarz JA: A mechanism for the amelioration by hyperbaric oxygen of experimental staphylococcal osteomyelitis in rabbits. *J Infect Dis* 142: 915, 1980. [PMID: 7462700]
94. Park MK, Muhvich KH, Myers RA, Marzella L: Hyperoxia prolongs the aminoglycoside-induced post antibiotic effect in *Pseudomonas aeruginosa*. *Antimicrob Agents Chemother* 35: 691, 1995. [PMID: 1906262]
95. Stevens DL: The pathogenesis of clostridial myonecrosis. *Int J Med Microbiol* 290: 497, 2000. [PMID: 11111933]
96. Bakker DJ: Clostridial myonecrosis (gas gangrene). In: Weaver LK (ed): *Undersea and Hyperbaric Medical Society Hyperbaric Oxygen Therapy Indications,* 13th ed. North Palm Beach, FL: Best Publishing Company; 2014:67-75.
97. MacLennan JD: The histotoxic clostridial infections of man. *Bacteriol Rev* 26: 177, 1962. [PMID: 14468017]
98. Hitchcock CR, Demello FJ, Haglin JJ: Gas gangrene: new approaches to an old disease. *Surg Clin N Am* 55: 1403, 1975. [PMID: 1198297]
99. Heimbach RD: Gas gangrene. In: Kindwall EP (ed): *Hyperbaric Medicine Practice.* Flagstaff, AZ: Best Publishing Company; 1994.
100. Willis AT: *Clostridia of Wound Infection.* London: Butterworth; 1969.
101. Schoemaker G: Oxygen tension measurements under hyperbaric conditions. In: Boerema I, Brummelkamp WH, Meijne NG (eds): *Clinical Applications of Hyperbaric Oxygen.* Amsterdam: Elsevier; 1964.
102. Kivisaari J, Ninnkoski J: Use of silastic tube and capillary sampling technique in the measurement of tissue PO2 and PCO2. *Am J Surg* 125: 623, 1973. [PMID: 4699206]
103. Sheffield PJ: Tissue oxygen measurements. In: Davis JC, Hunt TK (eds): *Problem Wounds: The Role of Oxygen.* New York: Elsevier; 1988.
104. Hill GB, Osterhout S: Experimental effects of hyperbaric oxygen on selected clostridial species. I. In-vitro studies. *J Infect Dis* 125: 17, 1972. [PMID: 4322847]
105. Van Unnika AJM: Inhibition of toxin production in clostridium perfringens in vitro by hyperbaric oxygen. *Antonie Van Leeuwenhoek* 31: 181, 1965. [PMID: 14315638]
106. Kaye D: Effect of hyperbaric oxygen on clostridia in vitro and in vivo. *Proc Soc Exp Biol Med* 124: 360, 1967. [PMID: 4289714]
107. Nora PF, Mousavipour M, Laufman H: Mechanisms of action of high pressure oxygen in *Clostridium perfringens* exotoxin toxicity. In: Brown JW, Cox BG (eds): *Hyperbaric Medicine* (publication 1404). Washington, DC: National Academy of Science National Research Council; 1966.
108. Nora PF, Mousavipour M, Mittlepunkt A, Rosenburg M, Laufman H: Brain as target organ in clostridium perfringens cytotoxin. *Arch Surg* 92: 243, 1966. [PMID: 4285493]
109. Muhvich KH, Anderson LH, Mehm WJ: Evaluation of antimicrobials combined with hyperbaric oxygen in a mouse model of clostridial myonecrosis. *J Trauma* 36: 7, 1994. [PMID: 8295252]
110. Demello FJ, Hashimoto T, Hitchcock CR, Haglin JJ: The effect of hyperbaric oxygen on the germination and toxin production of clostridium perfringens spores. In: Wada J, Iwa JT (eds): *Proceedings of the Fourth International Congress on Hyperbaric Medicine.* Baltimore, MD: Williams and Wilkins; 1970:270.
111. Hart GB, Lamb RC, Strauss MD: Gas gangrene: a collective review. *J Trauma* 23: 991, 1983. [PMID: 6355502]
112. Hirn M, Niinikoski J: Hyperbaric oxygen in the treatment of clostridial gas gangrene. *Ann Chir Gynaecol* 77: 37, 1988. [PMID: 3207345]
113. Desola J, Escola E, Moreno E, Munoz MA, Sanchez U, Murillo F: Combined treatment of gaseous gangrene with hyperbaric oxygen therapy, surgery and antibiotics. A national cooperative multicenter study. *Med Clin (Barc)* 94: 641, 1990. [PMID: 2200935]
114. Bakker DJ: The use of hyperbaric oxygen in the treatment of certain infectious diseases, especially gas gangrene and acute dermal gangrene. Wageningen, Holland: Drukkerij Veenman BV; 1984.
115. Bakker DJ: Clostridial myonecrosis. In: Bakker DJ, Cramer FS (eds): *Hyperbaric Surgery: Perioperative Care.* Flagstaff, AZ: Best Publishing Company; 2002:283-316.
116. Brummelkamp WH, Hogendijk J, Boerema I: Treatment of anaerobic infections (clostridial myositis) by drenching the tissues with oxygen under high atmospheric pressure. *Surgery* 49: 299, 1961.
117. Brummelkamp WH: Considerations on hyperbaric oxygen therapy at three atmospheres absolute for clostridial infections type welchii. *Ann NY Acad Sci* 117: 688, 1965. [PMID: 14252018]
118. Ertmann M, Havemann D: Behandlung de gasodems. Ergebnisse einer retro- und prospektiven analyse des unfallchirurgischen krankenguts aus 20 jahren. *Unfallchir* 95: 471, 1992.
119. Carlson S, Jones J, Brown M: Prevention of hyperbaric-associated middle ear barotrauma. *Ann Emerg Med* 21: 1468, 1992. [PMID: 1443845]
120. Clements KS, Vrabec JT, Mader JT: Complications of tympanostomy tubes inserted for facilitation of hyperbaric oxygen therapy. *Arch Otolaryngol Head Neck Surg* 12: 278, 1998. [PMID: 9525511]
121. Plafki C, Peters P, Almeling M, Welslau W, Busch R: Complications and side effects of hyperbaric oxygen therapy. *Aviat Space Environ Med* 71: 119, 2000. [PMID: 10685584]
122. Trytko B, Bennett M: Hyperbaric oxygen therapy: complication rates are much lower than authors suggest. *Br Med J* 318: 1077, 1999. [PMID: 10336294]
123. Hart GB, Strauss MB: Central nervous system oxygen toxicity in a clinical setting. In: Bove AA, Bachrack AJ, Greenbaum LJ (eds): *Undersea and Hyperbaric Physiology IX*. Bethesda, MD: Undersea and Hyperbaric Medical Society; 1987.
124. Davis JC, Dunn JM, Heimbach RD: Hyperbaric medicine: patient selection, treatment procedures, and side-effects. In: Davis JC, Hunt TK (eds): *Problem Wounds*. New York: Elsevier; 1988.

125. Sanders RW, Katz KD, Suyama J, et al: Seizure during hyperbaric oxygen therapy for carbon monoxide toxicity: a case series and five-year experience. *J Emerg Med* 42: e69, 2012. [PMID: 19372022]
126. Thom SR: Hyperbaric oxygen therapy. *J Intensive Care Med* 4: 58, 1989.
127. Thorsen E, Aanderud L, Aasen TB: Effects of a standard hyperbaric oxygen treatment protocol on pulmonary function. *Eur Respir J* 12: 1442, 1998. [PMID: 9877506]
128. Clark JM, Lambersten CJ: Rate of development of pulmonary O2 toxicity in man during O2 breathing at 2.0 atm absolute. *J Appl Physiol* 30: 739, 1971. [PMID: 4929472]
129. Rusca F, Garetto G, Ambrosio F: HBO therapy and pulmonary function tests. *Undersea Biomed Res* 18: 112, 1991.
130. Lyne AJ: Ocular effects of hyperbaric oxygen. *Trans Ophthalmol Soc UK* 98: 66, 1978. [PMID: 285513]
131. Palmquist BM, Philipson BO, Barr PO: Nuclear cataract and myopia during hyperbaric oxygen therapy. *Br J Ophthalmol* 68: 113, 1984. [PMID: 6691953]
132. Gesell L, Trott A: De novo cataract development following a standard course of hyperbaric oxygen therapy. *Undersea Hyperb Med* 34: 389, 2007. [PMID: 18251434]
133. Van Hoesen K, Camporesi EM, Moon RE, et al: Should hyperbaric oxygen be used to treat the pregnant patient for acute carbon monoxide poisoning? A case report and literature review. *JAMA* 261: 1039, 1989. [PMID: 2644457]
134. Sheffield PJ, Desautels DA: Hyperbaric and hypobaric chamber fires: a 73-year analysis. *Undersea Hyperb Med* 24: 153, 1997. [PMID: 9308138]