Asian Journal of Health Research
Journal Homepage: https://a-jhr.com
Published by Ikatan Dokter Indonesia Wilayah Jawa Timur

OPEN ACCESS

Editorial

Maritime Medicine, Hyperbaric and Emergency Case in The Future

Hisnindarsyah*
Head of Study Program, Maritime Medicine Specialist Education Program, Hang Tuah University, Surabaya, East Java, Indonesia

***CORRESPONDING AUTHOR**
Hisnindarsyah
hisnindarsyah@hangtuah.ac.id
Head of Study Program, Maritime Medicine Specialist Education Program, Hang Tuah University, Surabaya, East Java, Indonesia

Cite this as: Hisnindarsyah (2024) Maritime Medicine, Hyperbaric and Emergency Case in The Future. *Asian J Heal Res.* 3 (2): 99–101. doi: 10.55561/ajhr.v3i2.170

The future of maritime medicine holds promising advancements, driven by technological innovation, enhanced training protocols, and a deeper understanding of the unique challenges faced by seafarers. Here's a glimpse into what the future might hold advanced telemedicine capabilities will enable real-time consultations between maritime healthcare providers and specialists onshore. Wearable devices and sensors will allow continuous monitoring of crew members' health parameters, facilitating early detection of illnesses or injuries [1].

Artificial Intelligence and Machine Learning or AI-driven diagnostic tools will assist onboard medical personnel in accurately diagnosing conditions and recommending treatment plans. Machine learning algorithms trained on vast datasets of maritime health records will identify patterns and trends, enabling proactive healthcare interventions [1].

In the future maybe autonomous medical drones or robots equipped with medical supplies and basic diagnostic capabilities could be deployed to remote vessels for emergency medical assistance or to transport critical patients to shore-based facilities. In personalized Medicine, Genetic testing and personalized medicine will play a significant role in optimizing healthcare delivery for seafarers. Tailored treatment plans based on individuals' genetic profiles and predispositions will improve outcomes and minimize adverse reactions to medications.

Virtual Reality (VR) Training or VR simulations will provide maritime medical personnel with realistic scenarios to enhance their emergency response skills and decision-making abilities. This immersive training environment will better prepare them to handle medical emergencies effectively.

Environmental Monitoring in maritime medicine in the future may produce advanced sensors that will continuously monitor environmental factors onboard vessels, such as air quality, temperature, humidity, and radiation levels. This data will be integrated into health monitoring systems to identify potential health risks and mitigate them proactively. Recognizing the mental health challenges faced by seafarers due to isolation, long periods away from home, and demanding work conditions, there will be a greater focus on providing mental health support services. This may include onboard counseling, virtual therapy sessions, and resilience training programs.

Emerging medical technologies, such as regenerative medicine, gene therapy, and nanotechnology, may offer novel approaches to treating maritime health issues, including wound healing, infectious diseases, and chronic conditions. Maritime health organizations, regulatory bodies, and industry stakeholders will work together to establish standardized protocols, guidelines, and best practices for delivering quality healthcare to seafarers worldwide. This collaboration will ensure consistency in medical standards and improve the overall health and well-being of maritime workers.

Enhanced coordination between maritime authorities, medical facilities, and rescue services will

lead to the development of robust emergency response infrastructure. This will enable swift and efficient medical evacuations and emergency interventions in case of maritime accidents or health crises [2, 3].

The future of maritime medicine holds great promise for improving the health outcomes and quality of life for seafarers, ensuring their safety and well-being as they navigate the world's oceans.

The Role of HBOT in Health in Indonesia

Hyperbaric oxygen therapy (HBOT) holds significant promise as a future therapy in maritime medicine due to its potential to treat a wide range of conditions commonly encountered at sea. Here's how HBOT could impact maritime medicine in the future: HBOT is already a standard treatment for decompression sickness (DCS) and arterial gas embolism (AGE), both of which can occur in divers who ascend too quickly or suffer barotrauma. In the future, HBOT chambers could become more accessible onboard vessels, allowing for prompt treatment of diving emergencies without the need for immediate evacuation.

HBOT has been shown to accelerate wound healing by stimulating the growth of new blood vessels and promoting tissue regeneration. In the maritime setting, where injuries and wounds are common, HBOT could be utilized to expedite the healing process, reducing the risk of infection and complications. Carbon monoxide (CO) poisoning can occur onboard vessels due to engine exhaust or malfunctioning heating systems. HBOT helps to rapidly eliminate CO from the bloodstream, preventing tissue damage and neurological complications. Having HBOT facilities onboard ships could be crucial for treating CO poisoning cases effectively [4]**.**

HBOT has antimicrobial effects and can enhance the body's immune response, making it useful in the treatment of certain infections, including those caused by bacteria that are resistant to antibiotics. In maritime settings where medical resources may be limited, HBOT could serve as an adjunctive therapy for severe or stubborn infections [4]. In the event of a radiation emergency, such as a nuclear accident or radiation therapy mishap, HBOT may play a role in mitigating radiation-induced tissue damage and promoting recovery. Ships equipped with HBOT chambers could provide a valuable resource in responding to such emergencies, especially in remote or disaster-affected areas.

HBOT has shown promise in the treatment of neurological conditions such as traumatic brain injury (TBI) and stroke. Given the potential for head injuries and cerebrovascular events at sea, HBOT could be beneficial in improving outcomes for affected individuals, provided timely access to treatment is available. Continued research into the therapeutic effects of HBOT may uncover additional applications relevant to maritime medicine. Collaborative efforts between maritime health organizations, research institutions, and hyperbaric medicine specialists could drive innovation in this field and expand the scope of HBOT utilization in the maritime setting.

Overall, integrating HBOT into maritime medical facilities and emergency response protocols could enhance the capacity to address a variety of acute and chronic health conditions encountered at sea, ultimately improving the safety and well-being of seafarers. However, ensuring appropriate training for medical personnel and maintaining high standards of safety and equipment maintenance will be essential to the successful implementation of HBOT in maritime medicine.

The Importance of Maritime Medicine Specialist Education in Indonesia

In the future, specialized doctors in maritime medicine, particularly those trained in emergency medicine, will play critical roles in managing medical emergencies at sea. Here's how their functions might evolve: Maritime medicine specialists will lead emergency response teams onboard vessels, coordinating the initial assessment, stabilization, and management of medical emergencies. They will work closely with the ship's captain, crew members, and shore-based medical support to ensure timely and effective interventions.

Specialists in maritime emergency medicine will possess advanced diagnostic skills to rapidly assess and diagnose a wide range of medical conditions, including trauma, cardiovascular emergencies, infectious diseases, and neurological events. Their ability to make accurate diagnoses under challenging maritime conditions will be crucial for guiding appropriate treatment strategies.

Maritime medicine specialists will develop and oversee treatment plans tailored to the specific needs of patients in emergencies. They will make use of available resources, including medical supplies, equipment, and telemedicine support, to deliver optimal care while considering the constraints of the maritime environment.

Hyperbaric Medicine Expertise especially maritime medicine specialists given the potential for diving emergencies and other conditions requiring hyperbaric oxygen therapy (HBOT) at sea, specialists in maritime medicine may have training in hyperbaric medicine. They will be responsible for conducting HBOT sessions, monitoring patient responses, and ensuring the safety and efficacy of treatment [4-7]. In cases where advanced medical care is needed beyond the capabilities of onboard facilities, maritime medicine specialists will assess the need for medical evacuation and coordinate

evacuation procedures with relevant authorities and medical facilities onshore. Their expertise in triaging patients and determining the most appropriate course of action will be vital for ensuring timely evacuation and optimal patient outcomes.

Specialists in maritime emergency medicine will provide training and education to onboard medical personnel and crew members, equipping them with the knowledge and skills necessary to respond effectively to medical emergencies. Training programs may cover topics such as basic life support, advanced cardiac life support, trauma care, and disaster preparedness.

Maritime medicine specialists will engage in research activities aimed at advancing the field of emergency medicine in the maritime setting. They may conduct studies on topics such as the epidemiology of maritime medical emergencies, the effectiveness of different treatment modalities, and strategies for optimizing emergency response protocols [8].

Specialists in maritime emergency medicine will participate in quality assurance initiatives to evaluate the effectiveness of emergency medical services onboard vessels and identify areas for improvement. They will collaborate with maritime authorities, regulatory agencies, and industry stakeholders to establish and uphold high standards of medical care at sea [9].

Overall, doctors specializing in maritime emergency medicine will be instrumental in safeguarding the health and well-being of seafarers by providing expert medical care during emergencies and promoting a culture of safety and preparedness within the maritime industry. Hopefully, this article can provide benefits for all of us.

REFERENCES

1. Sabarguna, B. S., Pratiknya, D. E & Hisnindarsyah (2024). Decision Support System Software for Normal Pregnancy, in Maritime Medicine, Setting for Costal Situation, Recommended for Making A Decision Support System for Diving Fishermen. *Journal of Medical and Nursing Studies.* Vol. 2(2), 1–3
2. Jiang, M., & Zhu, Z. (2022). The Role of Artificial Intelligence Algorithms in Marine Scientific Research. *Frontiers in Marine Science*, *9*(May), 1–4. https://doi.org/10.3389/fmars.2022.920994
3. Márquez, F. P. G., Papaelias, M., & Marini, S. (2022). Artificial Intelligence in Marine Science and Engineering. *Journal of Marine Science and Engineering*, *10*(6). https://doi.org/10.3390/jmse10060711
4. Nurdianto, A. R., Aryati, A., Suryokusumo, M. G., & Mufasirin, M. (2019). Elevation of Bcl2 expression in artery spiralis of pregnant Rattus norvegicus infected with Tachyzoite of Toxoplasma gondii with hyperbaric oxygen therapy. *Qanun Medika - Medical Journal Faculty of Medicine Muhammadiyah Surabaya*, *3*(2), 157. https://doi.org/10.30651/jqm.v3i2.2706
5. NURDIANTO, A. R., ARYATI, A., SURYOKUSUMO, M. G., & MUFASIRIN, M. (2019). Downregulates of ICAM1 expression in Myometrium from pregnant Rattus novergicus infected with Tachyzoite of Toxoplasma gondii with Hyperbaric Oxygen Therapy. *Hang Tuah Medical Journal*, *17*(1), 77. https://doi.org/10.30649/htmj.v17i1.200
6. Nurdianto, A. R., Aryati, A., Suryokusumo, M. G., Mufasirin, M., Suwanti, L. T., Sunarjo, Sardjono, T. W., & Dachlan, E. G. (2020). Effects of hyperbaric oxygen therapy on IL-17, fetal body weight, and total fetus in pregnant Rattus norvegicus infected with tachyzoite Toxoplasma gondii. *Systematic Reviews in Pharmacy*, *11*(3), 628–634. https://doi.org/10.31838/srp.2020.3.84
7. Nurdianto, A. R., & Suryokusumo, M. G. (2020). Efek Proteksi dari Terapi Oksigen Hiperbarik terhadap Ekspresi Bcl-2 Miometrium Rattus norvegicus Bunting yang Terinfeksi oleh Tachyzoite Toxoplasma gondii Protective Effect of Hyperbaric Oxygen Therapy to Bcl-2 Expression in the Myometrium of Pregnant Ra. *Jurnal Ilmiah Kedokteran*, *2071*(1), 85–96.
8. Office, M. E. (2024). Acknowledgment to Reviewers of Maritime Technology and Research in 2023. *Maritime Technology and Research*, *6*(1), 270844. https://doi.org/10.33175/mtr.2024.270844
9. Bygvraa, D. A., Adhikari, T. B., Charalambous, G., & Jensen, O. C. (2020). Maritime doctors' skills and competencies: A review for policy analysis. *Maritime Technology and Research*, *2*(1), 40–51. https://doi.org/10.33175/mtr.2020.206375