AUTOMATED EXTERNAL DEFIBRILLATORS: ENHANCING EMERGENCY RESPONSE AT SEA

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AUTOMATED EXTERNAL DEFIBRILLATORS (AED) ARE PORTABLE DEVICES DESIGNED TO TREAT SUDDEN CARDIAC ARREST (SCA) BY DELIVERING AN ELECTRIC SHOCK TO RESTORE NORMAL HEART RHYTHM. THEIR ROLE IN IMPROVING SURVIVAL RATES HAS MADE THEIR ADOPTION AN INCREASINGLY CONSIDERED OPTION TO ENHANCE ONBOARD MEDICAL PREPAREDNESS.

FLAG STATE AND REGULATORY STANCE

Unless mandated by the flag administration (e.g., required in Germany[1], since September 2012[2]), carrying AEDs on board merchant ships remains optional for most flag states, with the decision to carry them depending on the shipowner's discretion or risk assessment for managing medical emergencies onboard.

THE ROLE OF AEDS IN SUDDEN CARDIAC ARREST (SCA)

SCA usually occurs unexpectedly and requires immediate intervention. AEDs can significantly increase survival rates when deployed within the critical 3-5 minute window[3], with research[4] indicating survival rates of up to 50%[5].

KEY ADVANTAGES

- **User-friendly:** AEDs are designed for non-medical personnel, featuring voice prompts, visual cues and instructional posters to guide users
- **Survival potential:** Without AED intervention, survival rates for SCA are effectively zero onboard
- **Crew welfare:** Equipping ships with AEDs signals a strong commitment to crew safety and wellbeing.

FACTORS INFLUENCING EFFECTIVE USE

- **Training gaps:** While AEDs are designed for simplicity, familiarity and confidence, this can only be achieved through regular training and drills
- **Maintenance shortfalls:** Irregular upkeep can result in equipment failure during emergencies
- **Lack of guidance in real-time:** Shore-based healthcare providers can offer valuable support during AED use with regards to the correct application and subsequent post-event care.

FOR FURTHER INFORMATION
Please do not hesitate to contact the Britannia loss prevention team at lossprevention @tindallriley.com.

PRACTICAL CONSIDERATIONS FOR IMPLEMENTATION OF AED'S

1. STRATEGIC PLACEMENT AND ACCESSIBILITY

- Multiple units should be considered for larger ships to minimise response time
- AEDs must be stored in clearly marked, accessible locations.

2. MAINTENANCE AND READINESS

- Regular maintenance, including battery checks and electrode pad replacements as per the manufacturers recommendations/instructions
- Routine inspections, testing and diligent record-keeping ensure AED reliability
- Planned maintenance and inspections should be incorporated into the ship's Planned Maintenance System (PMS).

3. TRAINING AND INTEGRATION

- Crew must be trained in both AED use and cardiopulmonary resuscitation (CPR) for optimal effectiveness
- Emergency response procedures should integrate AED deployment into the ship's Safety Management System (SMS)
- Initial training by the manufacturer or supplier is recommended to align with device specifications. Refresher courses can be facilitated by accredited providers.

EFFECTIVENESS AND AFTERCARE

- AEDs are designed to analyse heart rhythms and advise whether a shock is necessary. Devices typically provide easily understood prompts to assist the user
- Proper aftercare is critical. If an AED successfully restarts a patient's heart, the crew must monitor the individual until shore-based medical assistance or medevac is available
- Limited medical training on board may affect post-resuscitation care. Healthcare providers emphasise the importance of real-time shore-based guidance during emergencies.

SHORE-BASED MEDICAL SUPPORT

Shore-based medical support systems are invaluable during onboard emergencies, particularly when AEDs are in use. Providers of remote medical support systems, such as International SOS[6] and Telemedical Assistance Services (TMAS[7]), offer 24/7 support from qualified healthcare professionals. Ships should immediately contact their appointed onshore medical provider for real-time guidance to ensure proper AED deployment, CPR administration, and post-event monitoring and care.

LESSONS FROM REAL-WORLD CASES

Although cardiac events are rare on board, documented cases exist where AEDs have saved lives, particularly on passenger ships[8]. These examples demonstrate the practical value of AEDs and may be indicative of similar outcomes being achievable on merchant ships with proper planning and preparedness.

RECOMMENDATIONS FOR SHIPOWNERS WHO CHOOSE TO SUPPLY AEDS ONBOARD

- **Training and drills:** Ensure crew are trained in AED operation and CPR through accredited programmes
- **Maintenance programmes:** Establish regular checks, battery/adhesive pads (electrode) replacements, and record-keeping protocols
- **Medical support infrastructure:** Consider implementing shore-based medical support systems for guidance during emergencies (if not already done so)
- **Collaboration with service providers:** Engage equipment manufacturers for initial training and long-term maintenance support, supplemented with refresher training provided either by the manufacturer or preferred accredited training providers for further tailored support and recommendations.

While not mandated for all ships, AEDs represent a significant opportunity to enhance crew safety and emergency preparedness. Their user-friendly design, when paired with proper training, maintenance, and medical support, can make a critical, life-saving difference during cardiac emergencies. Shipowners are encouraged to assess the potential benefits of AED adoption and take proactive steps to ensure their ships are equipped and prepared to handle such scenarios effectively.

1. https://www.deutsche-flagge.de/de/redaktion/dokumente/dokumente-sonstige/2024-01-09-tenth-notice-of-the-state-of-medical-requirements-in-maritime-shipping.pdf
2. https://academic.oup.com/jtm/article-abstract/18/4/233/1805343
3. https://www.aedcpr.com/articles/when-to-use-an-aed-recognizing-cardiac-arrest/
4. https://www.ahajournals.org/doi/full/10.1161/circ.102.suppl_1.i-60
5. https://www.ahajournals.org/doi/full/10.1161/CIRCULATIONAHA.117.029067
6. https://www.internationalsos.com/sectors/maritime
7. https://www.imo.org/en/OurWork/Safety/Pages/GlobalSARPlan.aspx
8. https://www.martek-marine.com/wp-content/uploads/2023/10/How-to-survive-sudden-cardiac-arrest-at-sea-10.2023.pdf