

WORKSHOP REPORT

THE 4TH IMHF WORKSHOP ON MARITIME HEALTH ON BOARD

„TELEMEDICINE FOR SHIPS IN FUTURE “

11.-12. November 2022; Berlin, Germany

Introduction

Following its statutory objectives, the International Maritime Health Foundation (IMHF) decided to conduct a series of expert workshops following the proposals of its Expert Panel (EP).¹ The IMHF-EP consists of medical professionals, all of them engaged in various aspects of healthcare for seafarers.² In parallel to IMHF's primary project, the journal "International Maritime Health (IMH)", these workshops shall collect relevant expertise and knowledge to provide state of art guidance for maritime health practice.³

The International Labour Office's (ILO) Convention 2006 (as amended) states that seafarers' medical care should be "as comparable as possible to that which is generally available to workers ashore". While this may leave room for interpretation the IMHF-EP held the opinion that the implementation of this rule would need specific definition and that in the end medical guidelines should be established that would reflect the conditions of the maritime environment as well as those of actual best medical practice.

The management of medical incidents of any severity on board commercial ships mainly depends on three columns: 1) the skills of the medical responsible officer on board, 2) the quality of advice and recommendations given by telemedical service provider and 3) the quality of the medical equipment on board.^{4,5,6,7} Whilst 1) and 3) are discussed in separate workshops, the reported one aimed for evaluation of future improvement of the telemedical advise given itself as well as for training and education for all parties involved, considering the implications for technical requirements and training of medical responsible officers.

Tools for collecting, structuring, transmitting and validating data are rapidly developing. This may open possibilities for collecting structured individual patient data in medical incidents on board. The collection of a wider range of vital parameters is possible too, possibly also interpretation and the best-found diagnosis.⁸ The technological development may influence the direction of this communication and give new opportunities for collecting information to be used for guiding the medical officer.^{9,10}

The aim of the workshop has been to reach consensus of what telemedical support to ships should look like in future, to evaluate how telemedicine for ships may and should adopt options that are available ashore, and to define consequences that apply to training and education of medical responsible officers on board ships and medical assistance providers on shore.

Materials and Methods

The workshop "Telemedicine for ships in future" was held at the Unfallkrankenhaus Berlin, Germany, November 11th-12th, 2022. The following 14 experts were identified, invited and attended the workshop: Jon Magnus Haga (Norwegian Centre for Maritime and Diving Medicine; IMHF-EP);

Nebojsa Nolic (IMHF-EP); Alf Magne Horneland (IMHF-Management Board [MB]); Beate Stelzer (Master of container vessels; Maersk); Jens Tülsner (Marine Medical Solutions; IMHF-EP; DGMM), Joanna Ewa Safran (TMAS Poland); Patrick Roux (TMAS - France); Francesco Amenta (CIRM - Italy); Guiliano Pesel (CIRM - Italy), Margarita Huerte (Nordic Medical Clinic, OSM, Philippines; IMHA Board); Dennis Gumbel (Unfallkrankenhaus Berlin); Admir Kulin (m.Doc); Sascha Burggraf (Marine Medical Solutions) and Spike Briggs (MSOS) – by virtual presence.

For initial overview and as a basis for the following explorations and discussions, five presentations were given by participants depending on their particular area of expertise: “IMHF and IMHF Workshops” (Alf Magne Horneland), „Definition and scope of Telemedicine for ships“ (Jens Tülsner), „Telemedicine - Applications: What is available ashore and how does it fit into a „holistic care model?“ (Admir Kulin); “Telemedical Service - experience and gaps in information provided“ (Francesco Amenta) and „How must the vision of future Telemedical Services reflect on training and education?“ (Jon-Magnus Haga). These presentation were supplemented by three remote (*Teams*) presentations and demonstrations of some digital tools and platforms that already are available globally: *BINAH* - Israel (<https://www.binah.ai/>); *MedAssist Online* - Netherlands (<https://medassist.online/>); *QT Medical* - USA (<https://www.qtmedical.com/>)

To achieve the aim of the workshop, three Working groups (WG) have been constituted to separately discuss relevant topics identified as potential drivers for future developments of Telemedicine for ships. Each topic was analyzed, discussed, and prepared for presentation by a Working group, and presented in a plenary session for further discussion. This report/consensus statement was drafted based on the views expressed in the discussion and later tuning process, after the workshop. Final document was sent to IMHF EP panel for their opinion before its approval by the IMHF Management Board.

Results

WG 1: WHAT PARAMETERS AND INFORMATION SHOULD BE STANDARD TO BE RECEIVED FROM THE SHIPS IN THE FUTURE?

Initial information to be transmitted from the vessel requesting medical advice:

- IMO Code of the vessel.
- Name of vessel.
- Flag state.
- Type of vessel,
- Number of the persons on board.
- Position of the vessel.
- Departure and arrival port and date.
- Who is calling? (name/ rank).

Patient – relevant information:

- Name, Surname.
- DOB/ Age.
- Sex.
- Nationality.
- Rank.

Data relevant to assess the situation (the list is non exhaustive):

- **Medical problem:**
 - o The reason why they call the telemedical support?
 - o When did it start, how has it develop, treatment thus far?
 - o Vitals (Height/ weight, heart rate, blood pressure, frequency of breathing, temperature, blood sugar);
 - o Consciousness (Glasgow-Coma-Scale); Pain Scale
- **Context:**
 - o What the person did before the injury/illness, symptoms (when the symptoms started? Other persons with the same symptoms on board)
 - o Actual problems?
- **Previous history:**
 - o Previous medication? (dosage/ days);
 - o Allergies.
 - o Previous diseases/ medical treatment.
 - o Did the patient receive medical support already? If yes, what was done?
 - o Additional information's: SpO2 (after doctor advise)

WG 2: SCOPE OF TELEMEDICINE FOR SHIPS

The scope of future Telemedicine should include **preventive, diagnostic and therapeutic** approach, using tools available to achieve the best possible medical care for seafarers on board ships – to the level that can be managed on board using the available facilities:

Future Telemedicine for ships should be based on following four premisses:

1. Know the patient concept.
2. Telemedicine “completes the cycle” to the next PEME (Preemployment medical examination).
3. Organized portal that supports online exchange of data and enables the “know the patient” and “complete the cycle” concept.
4. Trained personnel (Universal certification?)

Knowledge and access to medical records of the patient is significantly improving understanding of the case, its management and clinical decisions in situations were treating doctors for the first time treats the patient in offshore situation. Application that enables an individualized storage of data for each crewmember will guarantee continuity of care and the creation of a progressive medical record. Those data must always have to be encrypted – so that access rights could be controlled. It will be the seafarer’s decision to agree or not to give the access. In case the shipowner will be included to some level – data must be protected in order to keep compliance with data privacy regulations and to keep intact the doctor-patient relationship.

A digital telemedical portal would provide opportunities to achieve a clear picture of the case, including follow up of the course of treatment. Implemented application for storage and exchange of

data should be multilingual/multicultural and enable reporting of medical data / Endorsement of patient to treating Doctor on shore (e.g., workflow of data to be available to another doctor in next port; incentive-based data on endorsement by Master)

Audio and Video option, transmission of pictures; connectivity to medical devices should be enabled (e.i the widening portfolio of Point of Care testing devices).

The Medical Chest Inventory may also be considered a part of such a platform - instant access with given review of the medicines required to be on board.

WG 3: WHAT IS TO BE EDUCATED AND TRAINED FOR STAFF ON BOARD AND ASHORE?

Considering upcoming broader technical options and solutions, a strong need for training and education of all involved parties has been agreed. This not only for the onboard medical responsible staff; but for the shoreside consulted Doctors, and Rescue services.

The topics identified are:

- For the telemedical assistance providing doctor:
 - o Ships medical chest/equipment
 - o Skills of the medical officer
 - o Use of the medical guide on board
 - o Skills in communication, maritime and medical English, use of interpreter
 - o Able to advice on exercises («train the trainer»)
 - o Maritime industry – ship operator
 - o Maritime context
 - o How to work with the rescue services/MRCC/rescue services/SAR
 - o offering advice and giving medical directions via telephone, text and video
 - o Legal/ethical aspects – incl. GDPR
 - o Documentation
 - o Know about PEME requirement?
 - o Regular clinical skills update
 - o Update on new technical update
- For the Medical officer and Master:
 - o Refer to the learning outcomes agreed in the Bergen workshop (STCW recommendation learning outcomes)
 - o Skills in communication medical English
 - o Ships medical chest/equipment + maintenance
 - o Know the guide
 - o Know how to communicate with TMAS/SAR/MRCC
 - o Advice in exercises (“train the trainer”)
 - o How to prepare a case for TMAS
 - o Legal/ethical issues
 - o Documentation
 - o Medical history, observation, examination, technical procedure

The Training should always consist of a combination of courses and continuous training on board, including scenario training. Portal, as described by WG 2 should also have the options for

training of onboard personnel and instructions on how to handle different medical activities. Concept of the outcome-oriented learning with defined learning outcomes/competences as defined for current needs by *The 2nd IMHF EP Workshop on Maritime Health on Board – Medical Training of Seafarers* (18 – 19 March 2022, Bergen, Norway) should be used in creating future training programs.

Discussion – identified obstacles, open issues and further Recommendations

The following points have led into some discussion:

1) The involvement of the shipowner / ship management company (SO/SMC) and / or its representatives (e.g. Crew Dept.) raised some questions that supersede the aim of this workshop, although find relevant to the subject of medical help on board. Considering the fact that the SO/SMC has a wide responsibility for the seafarer's health and its management, the issue of data privacy and confidentiality came up and has been discussed. No solution has been found (yet) how to keep compliance with GDPR/HIPPA regulations on one hand and the involvement of the SO/SMC in the loop of information and the medical care provided; especially in case of further management like shoreside referrals and/or medical disembarkation with shoreside treatment. This is highlighted as a specific issue in the general problem of confidentiality issues in medical telecommunications.

2) The usefulness and/or need for Video – options in medical telecommunication on board was discussed with aim to explore its validity, usefulness and realism of its use on board. Whilst a virtual impression of a patient is always considered useful in the best examination aiming to find the appropriate diagnosis and respectively appropriate treatment, reality is that not on all ship's the required bandwidth for this tool is secured. Considering the character of the industry it is not realistically to expect such a bandwidth on majority of ships in the near future. Beside this limitation it was recognised, that only a few cases have a real need and substantial benefit for video transmission. It has been agreed that the option for video-consulting should be given; the technical basis provided by the SO/SMC.

3) The need for point of care testing (POCT) was evaluated having in mind future developments of such a technology. Some options for simple POCT - testing are already given (e.g. Malaria, Infuenza, COVID19-testing). As the portfolio of POCT - testing is tremendously extended during the last years (simple machines detecting various parameter in whole blood/serum/urine/stool; simple ECG - devices and much more), still the pricing is comparably high while the use of such devices on board is very limited due to few cases on board per year; training needed to use them and their maintenance.

4) The availability of pre-embarkation medical information was discussed in the context of data usefulness on board. Whilst it has been agreed that future telemedicine on board should implement "Know your patient" "completes the cycle" to the next PEME concept, there was no agreement to be achieved regarding the validity of PEME related information in the telemedical setting: especially as the „Advanced PEME-profiles“ are not considered as always compliant to the flag state regulations. It was discussed if such information once available, would be manageable in compliance with data privacy and confidentiality rules.

5) During the presentation of the results of WG 1 and necessary data to be transmitted to medical advisor on shore, it has been widely explored if, and to what extent other information might be needed or useful. e.g., SpO2. While standard in emergency rooms on shore there was no

agreement, whether SpO2 is a useful parameter in on board context or if it's more potentially misleading for the consulted Doctor and designated medical persons on board. The discussion lead into agreement that this topic refers to two major aspects: the conclusions already taken during the WIHMF-Workshop on Training and educational outcomes (Bergen, March 2022) and the need of further exploration, for instance in additional workshop on Quality control and assurance for telemedical services provided for ships.

6) Competences and some further aspects of work of telemedical providers have been mentioned and discussed: Are all shoreside Doctors providing telemedical advise to ships familiar with the ship's / shipping environment and conditions? What should duties / shifts for telemedical Doctors should looks like? Should it be Doctors only providing telemedical advise? How can combined ship side / shoreside exercises be organised and executed? There is a clear need to define competences of telemedical providers and tune them with the future system of medical help on board.

Conclusion

International participants from various organisations and companies have discussed and reached consensus on foreseeable future needs of telemedicine for ships, considering recently available and / or future technical and digital options. Requirements for future services have been agreed and open issues needed to be overcome and resolved, identified.

The need for further workshops with following defined subjects has been agreed:

- Data privacy and confidentiality in the telemedical services for the shipping industry.
- Quality control and assurance for telemedical services for the shipping industry.
- Definition and creation of diagnostic and treatment pathways for telemedical assistance provider for ships.

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