

HEALTHY SHIP: A NEW PROJECT FOR IMPROVING MEDICAL CARE OF SAILING SEAFARERS

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Abstract—This paper summarizes the project Health Protection and Safety on Board Ships (acronym: HEALTHY SHIP) an initiative of Centro Internazionale Radio Medico (CIRM), the Italian Telemedical Maritime Assistance Service (TMAS). The project is aimed at improving standards of telemedical assistance of seafarers on board ships using telemedicine according to IMO MSC/Circular 960/2000. The main pillar of HEALTHY SHIP is the development on an electronic health record (HER) of seafarers on board ships of companies subscribing with CIRM the occupational medicine service compulsory for Italian. The Healthy Ship HER collect medical information obtained with fitting visits of seafarers which are implemented by BMI, Audiometry, ECG, Spirometry, Blood analyses collected occupational medicine visits on board ships. Access to these records is allowed to the occupational medicine team, to the doctors on duty for TMAS service at CIRM and each worker. Workers can access their health information worldwide via the Healthy Ship WEB site using a dedicated username and password. Delivery of high quality medical assistance requires a given technological background, but primarily the clinical history of a patient. Information collected for medical fitness and health surveillance of seafarers can be used for providing assistance in case of diseases or accidents on board. This could represent a way for providing without particular extra costs first class medical assistance to patients on board ships.

I. INTRODUCTION

Merchant ships in general do not carry medic or paramedic personnel and can be at sea for days or weeks before they can reach a port.

In case of accidents or diseases at sea, there may be a need to ask for medical advice from land. For more than 50 years, several radio medical services have been operational, starting by using radio signals and Morse code, evolving through telephones to full blown telemedicine solutions. Technological limitations are obvious. The doctor has never seen the patient, and most probably never will. Normally he

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will not even speak to the patient, but to the officer in charge of the treatment.

The officer with medical duties on board is the person in charge of the patient. The technical and medical skills of the medical officers on ships vary considerable, as do the language and cultural background. The limited medical background of the medical officer and the lack of knowledge of the health history of seafarers under treatment may make very difficult clinical interventions on board.

II. IMPROVEMENT OF MEDICAL ASSISTANCE TO SEAFARERS

Telemedicine is the only means by which is possible to get expert advice at sea, and there is significant experience in its advantages as well as its limitations. In spite of the technological progress, medical assistance to seafarers was not always improved in parallel with advances of medicine and of telecommunications. On the other hand, the need to seek medical advice does not occur very often on each ship. Hence, any system developed for maritime telemedicine purposes must be extremely simple on the ship end. Still, the systems must preserve the security and integrity of patient data, as well as help document the information exchange that has taken place between the doctor and the medical officer.

Collection of basic health information of seafarers will be certainly important for providing them high quality medical care.

A source of relevant clinical information of a seafarer is represented by fitting visit reports. However, collection of this information is complex, time-consuming and expensive.

III. HEALTHY SHIP PROJECT

For improving the quality of health care on board ships CIRM started the project Health Protection and Safety on Board Ships (acronym: HEALTHY SHIP). HEALTHY SHIP started in Italy for improving standards of medical assistance of seafarers on board ships using telemedicine according to the International Maritime Organization (IMO) MSC/Circular 960.

Healthy Ship is a project for providing global health protection of seafarers on board ships. The project follows the legal obligation relating to the “compulsory health information for workers destined overseas”, which is specifically governed by Italian Legislative Decree 81/2008 and following amendments, Legislative Decree 106/2009, to be met.

Phases of the project Healthy Ship include

- Health education
- Psychological assessment of on board employment

- and duty assignment
- Risk communication and management
- Occupational surveillance
- Stress prevention and management

Health education. It includes information campaigns on the major health risks for seafarers and on their prevention. Each campaign is preceded by a questionnaire on the awareness by the crews of the topics to be covered. The first campaign was focused on personal hygiene and infectious diseases prevention. Incoming topics will be:

- Food hygiene
- Prevention of sexually transmitted diseases.

Psychological assessment of on board employment and duty assignment. It includes setting of employer's profile by psycho-aptitude tests and training for equipe-work in the maritime environment using specific testing and high quality psychological counselling.

Risk communication and management. It is an action of sharing information to promote understanding about risk reduction and informed decision-making. Travelers must be actively involved in behavior decisions. They should receive relevant information about risks, possible consequences and how to minimize exposure during travel with "realistic" information. This according to the philosophy that *We must not prohibit, we have to inform*. Risk management strategy includes appropriate recommendations and prevention strategies provided to the traveler.

Occupational surveillance. It is the basis for analyzing and controlling worker's characteristics and the influence of what he is doing on its health. Health/medical data are collected into the same electronic system handled by CIRM/TMAS. The first institution takes the responsibility of coordinating health surveillance activity.

These data put into a WEB-based health database of each seafarer will be available as an electronic health record (HER) of the seafarer in case of accidents or diseases on board. CIRM/TMAS doctors can have access to these data in case of requests of telemedical advice. This will guarantee the delivery of high levels assistance based on the previous medical history of the seafarer.

The infrastructural organization of the project, done in collaboration by CIRM, Camerino University, single individuals and seafarer's associations is shown in Figure 1.

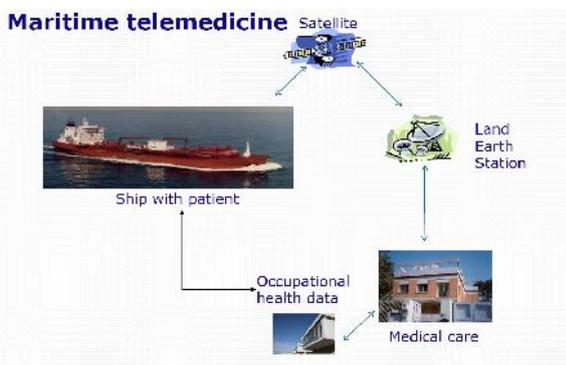


Fig. 2. Infrastructural organization in support of CIRM for the HEALTHY SHIP Project.

Delivery of high quality medical assistance requires a given technological background. For making easier and less expensive occupational surveillance on board, ships involved in this project will be equipped of basic telemedical devices for assessing blood pressure, pulse rate, electrocardiogram, blood oxygen levels (oxymetry) and basic hematochemistry tests. Information collected by these devices can be used for

Figs. 2-4 show the main parts of the electronic health record of HEALTHY SHIP software.

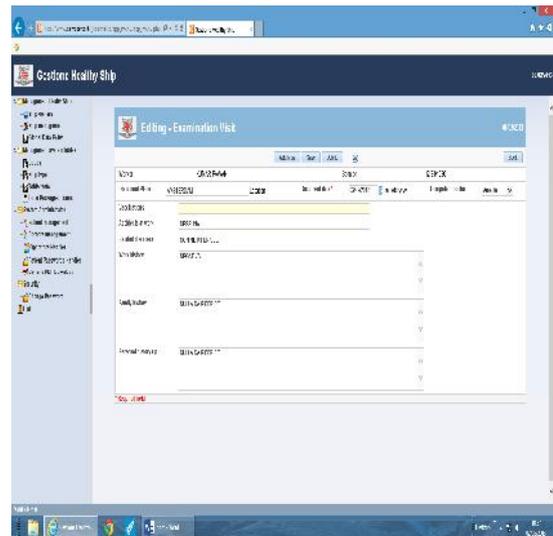


Fig. 2. Page of the HEALTHY SHIP software for collecting the health information of seafarers. Patient's history field.

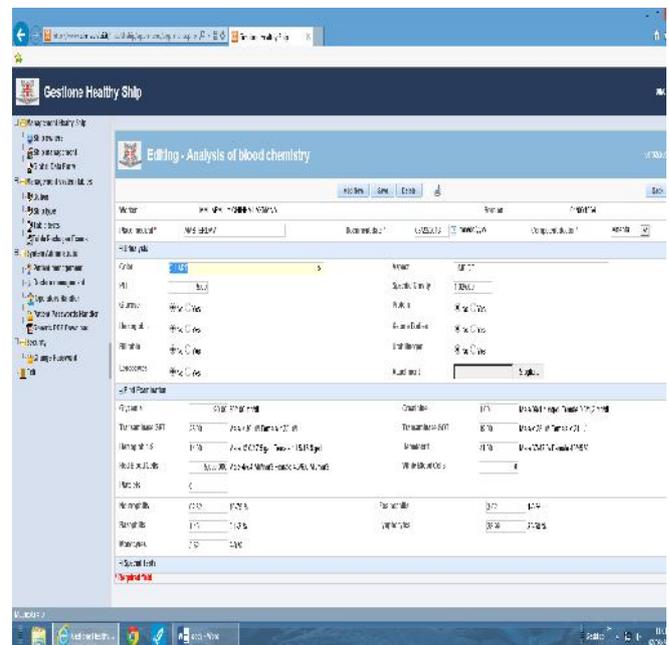


Fig. 3. Page of the HEALTHY SHIP software for collecting blood analysis data of seafarers.

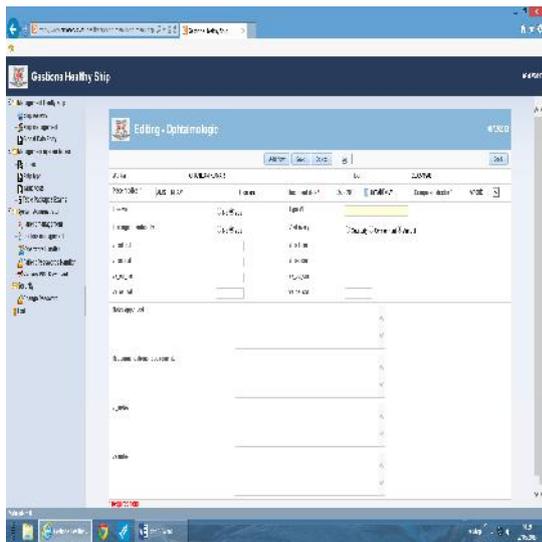


Fig. 4. Page of the HEALTHY SHIP software for collecting ophthalmological data of seafarers.

In the HEALTHY SHIP software any type of health data of seafarers could be recorded and these information can be extremely useful in case medical assistance is required. The constant potential availability of health data of single seafarers can also stimulate them to have greater sensitivity to their health/medical problems.

An additional task of HEALTHY SHIP is the stress prevention and management on board ships. This will include interventions listed below.

- Assessment of “perception of stress” in the specific sea-work set
- Training in stress management of the staff
- Improvement of communication between different groups of employers in order to promote cohesion of the “ship community” (even by using on board opportune visual signals with guide-lines to manage interpersonal conflicts)
- Preventing of burn-out
- Psychological teleassistance in emergency cases.

IV. CONCLUSIONS

One issue the doctor providing assistance to sailing seafarers has to face is that he or she has virtually no knowledge of the patient, save from the description that is received from the ship. Giving medical advice on this background can be difficult, and in many cases, it would have been valuable to have a general description of the medical status of the patient prior to the incident that causes the call for help.

The development of the HEALTHY SHIP EHR will be a great help in this situation and the content of the EHR should be identical or at least similar for all sailors.

Directing other types of health/medical data collection towards medical assistance in case of injuries or diseases on board will represent a way for providing without particular extra costs (costs should be already covered for occupational surveillance), medical assistance to patients on board ships.