maritime medical international

volume three • december 2010

Regulars

Mind over matter

Managing mental health

Also in this issue

When medical response is a matter of life and death

At sea and in medical distress? Thanks to Morse code, wireless telegraphy and subsequent advances in technology and communication, a badly injured or critically ill seafarer has a better than even chance today of receiving globally approved treatment and quality of care.

"Most of the medical cases onboard are not life-threatening and are relatively simple to treat. Even today, the term 'keep it simple and safe' has not lost its significance for medical advice and treatment on board," wrote Monika Puskappeleit and Lars Brandal, in the Textbook of Maritime Medicine. These cases may include cuts and burns, electrical and chemical injuries, and conditions related to extreme temperatures. For these conditions, onboard medical care is usually provided by a trained person, or a designated health officer, with a broad knowledge of first aid and medicine, who has the skills to dispense care and manage sickness or injury. He or she is aware of the working conditions onboard, the medical fitness of workers and any risks to health and safety.

In a 'medical event', the nature of the condition and the location of pain in an injured or ill person are identified and a physical examination conducted with quick on-the-spot tests (for example, Troponin blood tests which detect injury to heart muscle), and the monitoring of vital signs. Tissue samples may be collected for analysis. The patient is treated and stabilised and any follow-up care provided. The cardinal guidelines are: do no harm and give the best level of care with what is available onboard. But when in doubt, seek and obtain help.

Whereas most cruise ships are handsomely equipped with mini-hospitals and staffed by qualified doctors and nurses, not all ocean-going vessels have medically trained crews or on-call doctors onboard. The level and provision of care, the availability of medical supplies and equipment vary from ship to ship. Brief stays in ports do not always allow for visits to doctors and dentists for routine check-ups, and seafarers' working conditions can make getting urgent medical attention difficult.

In the event of a serious or traumatic medical incident, response may depend on the range of medical skills and capabilities available on board, and the ship's location in relation to shore-side facilities and equipment. Of paramount concern to the medically trained officer and, ultimately, the ship's captain, will be preventing unnecessary delays in the treatment of a critical injury or illness, e.g., a grave cardiovascular episode. Is the condition a hazard that could potentially endanger the health of others? Will the patient be evacuated to the nearest hospital? When should the patient's immediate family be informed?

The vast majority of onboard medical incidents are resolved at sea, but each year, when medical attention requires more than onboard competence and diagnostic capabilities, a number of ships are diverted to the nearest port, where specialist treatment can be had, or from where the patient can be repatriated home. Sending a ship back to port, when she can be two days away from land, can be a very costly affair; it is a decision not taken lightly by the ship's captain.

In 1958, the UN's International Labor Organisation (ILO) adopted proposals that stipulated that every member nation should ensure that medical advice given by radio is free of charge, every day of the year. Another ILO Convention (1987) states that "seafarers onboard requesting medical advice by radio or satellite communication shall be instructed in the use of the ship's medical guide and the medical section of the most recent edition of the international code of signals published by ILO so as to enable them to understand the type of information needed by the advising doctor, as well as the advice received."

One of the most significant results of these conventions was Resolution 164 of the International Maritime Organisation and ILO, which ratified that a telemedical maritime advice service centre (TMAS) should provide advice for seafarers 24 hours a day, every day of the year; that it should be permanently staffed by a qualified physician who is well-versed in the treatment of injuries and illnesses onboard ships and who will give remote diagnosis and consultation without extensive examination. The TMAS doctor usually has epidemiological knowledge of maritime medicine and has emergency-care expertise, including in anaesthesiology, surgery, dermatology, urology, ophthalmology, pain medication, intensive care and internal medicine.

Direct communication between shore and vessel became possible only at the beginning of the 20th Century, and for this the maritime industry has Samuel Morse to thank, for inventing a binary code of dots and dashes, and Guglielmo Marconi, for his successful experiments with electromagnetic waves, leading to wireless telegraphy.

Communication with shore-based experts – diagnosticians, doctors, paramedics – rapidly moved on to telex, short-wave radio, fax, to e-mail and real-time videoconferencing. Records of a patient's vital signs (BP, heart and pulse rates, temperature, Glasgow Coma scale) and photos showing actual clinical conditions can now be sent routinely down the line for consultation and analysis. Today's advanced satellite and interactive audio-visual communications systems – with their worldwide coverage – provide high-quality telephone and data interchange between medical professionals onshore and the first aid provider onboard ships.

"Knowing that these mariners are all by themselves, often in remote environments, gives me great pride when delivering medical guidance and care," said Dr Chris Lang, an ER doctor working with George Washington University's Maritime Medical Access (MMA), which provides urgent medical care, via phone and video, to about 600 ships worldwide. Someone is on hand at MMA every hour of the day to answer calls on anything from cardiac arrest, brain injury to broken limbs, and to connect ship's officers with onshore physicians. Screen monitors track ships' locations around the world; most diagnosis is done over the phone and MMA doctors talk the ship's designated medical officer through procedures.

MedAire, the aviation and maritime specialist group of International SOS, provides clients with "fully integrated life-saving medical support on jets, airlines, commercial ships and yachts." Its Global Response Center is hospital-based and its telemedicine advisory team is staffed by emergency-care doctors providing critical advice to ships' crews and helping them manage medical events at sea.

Boston-based Global Rescue, a medical-consultation service, relays critical medical support to sick and injured mariners who are thousands of miles away from hospitals or out of aircraft range. It provides a telephonic medical-advisory service, with its partners at the world-renowned Johns Hopkins Medicine, on treating injury or illness on the high seas. Global Rescue also offers deployable medical teams with emergency-medicine skills; transport by helicopter, jet or ground ambulance, or patient evacuation to home or hospital.

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The decision to evacuate a critically injured or sick seafarer is usually taken by the ship's captain, in consultation with TMAS doctors and a maritime regional rescue coordination centre. The safest medivac is using the vessel itself to the nearest port; or the ship can rendezvous with another vessel with more advanced medical equipment. By medic-manned helicopter is swift, but limited in range by fuel supply. Air ambulance and civilian helicopter services can be very expensive but most shipping companies are insured for these costs.

As ship-to-shore communications systems dramatically improve, technological innovations are being introduced all the time. RDT, a recognised leader in international telemedicine, produces compact and easy-to-use solutions to manage medical incidents in challenging – usually remote – locations. RDT's portable Tempus IC monitor transmits, via voice and video, real-time vital-signs data from ship to land-based doctors. When medivac is not always an option, Tempus, with its built-in Wi-Fi, mobile, satellite and Bluetooth links, provides non-medically trained captains and crews with expert advice from onshore doctors. RDT's i2i connects patients closer to doctors; its database of pictures and video, with annotation features, interlinks with patients' medical records, medications and treatments.

Sounding a note of caution, in the Textbook of Maritime Medicine, are Lucas Viruly and Bas Rikken, who wrote: "One should always realise that medical information is transferred from the ship, through the responsible officer, and occasionally through the patient himself. Therefore, the information is passed on with the possibility of being distorted. Language barriers, misinterpretation, miscommunication and the lack of socio-cultural understanding between the ship and the external advisor may cause such problems. Even with modern techniques, e.g., pictures by email, one can question whether the consultation will ever be of the same quality as if it was face-to-face."

As ship owners and shipping companies continue to improve their onboard medical-care systems, they are also keeping up to date with new technology. It's not quantum physics, but the best response is always a healthy response, when companies and crews promote a healthy lifestyle, inculcate good health habits among its workers, with seafarers benefiting from continuous health education all the time. ❤