

Travel by sea

This section was prepared in collaboration with the International Society of Travel Medicine.

Cruise itineraries cover all continents, including areas not easily accessible by other means of travel. Approximately 14 million passengers cruise annually, mainly in the Caribbean/Bahamas, including eastern Mexico, Alaska, the Mediterranean and the Greek Islands/Turkey, Europe, Hawaii, the Panama Canal, etc. The average duration of a cruise is 7.2 days, but cruises can last from a few hours to several months. A typical cruise ship now carries up to 3000 passengers and 1000 crew. Couples dominate the cruise demographic, although the number of families and extended families continues to grow. The average cruise passenger is 45-50 years old, with senior citizens making up about a third of passengers. Longer cruises in particular attract older travellers, a group likely to have more chronic medical problems.

The revised International Health Regulations address health requirements for the operation and construction of ships. There are global standards for ship and port sanitation, disease surveillance and response to infectious diseases. Guidance is provided on the provision of safe water and food, vector and rodent control and waste disposal. According to Article 8 of the International Labour Organisation Convention (No. 164) 'Concerning Health Protection and Medical Care for Seafarers' (1987), ships carrying more than 100 crew members on an international voyage of three days or more must provide a physician for the care of the crew.

These regulations do not apply to passenger vessels and ferries sailing for less than 3 days, even though the number of crew and passengers may exceed 1000. Ferries often do not have an emergency room, but a ship's officer or nurse is designated to provide medical assistance. The contents of the medical chest must comply with international recommendations and national laws for ocean-going commercial vessels, but there are no special requirements for additional medicines for passenger ships. It is also important to think of a cruise ship's medical facility as an infirmary, not a hospital. Although most medical conditions that arise on board can be treated as they would be in an outpatient clinic at home, more serious problems may require evacuation to a land-based hospital after stabilisation on the ship. Most cruise ships do not have assigned space for a dental office, and very few have a resident dentist.

The rapid movement of cruise ships from one port to another, with the likelihood of wide variations in hygiene standards and risk of exposure to infectious diseases, often results in the introduction of communicable diseases by embarking passengers and crew. In the relatively closed and crowded environment of a ship, diseases can be spread to other passengers and crew members; diseases can also be spread to the home communities of disembarking passengers and crew members. Outbreaks of measles, rubella, varicella, meningococcal disease, hepatitis A, legionellosis, and respiratory and

gastrointestinal illnesses have been reported among seafarers. Such outbreaks are of concern because of their potentially serious public health consequences and high costs to the industry. Outbreaks of influenza and norovirus in particular have been a challenge for the cruise industry. More than half of all emergency visits to shipboard health clinics are made by passengers over the age of 65.

Communicable diseases

Gastrointestinal disease

Most of the reported outbreaks of gastrointestinal illness associated with cruise ships have been linked to food or water consumed on board. Factors that have contributed to outbreaks include contaminated bunker water, inadequate water disinfection, potable water contaminated by ship sewage, poor design and construction of potable water storage tanks, deficiencies in food handling, preparation and cooking, and the use of seawater in the galley. Norovirus is the most common pathogen involved in outbreaks.

BOX Norovirus (unless ITH planned Box elsewhere)

Symptoms

- sudden onset of vomiting and/or diarrhoea
- possibly fever, abdominal cramps and malaise

Chronology:

- Incubation period: 1 to 2 days
- Duration of symptoms: usually 12 to 60 hours

Immunity: short-term, 6 to 14 weeks

Transmission

- spread in food or water
- from person to person fecal-oral route
- airborne following exposure to vomiting person

Epidemiology:

- in an outbreak on a cruise ship, $\geq 80\%$ of the passengers can be affected.

Outbreak investigations have shown that transmission among cruise ship passengers is almost exclusively person-to-person. To prevent or reduce outbreaks of gastroenteritis caused by norovirus, ships are improving food and water sanitation and surface disinfection; more ships are providing hand gel dispensers at strategic locations throughout the ship and passengers and crew are urged to use them. Some cruise lines require those presenting with gastrointestinal

symptoms to be isolated in on-board medical centres for at least 24 hours after their last symptoms, and some ships also isolate asymptomatic contacts for 24 hours.

Influenza and other respiratory tract infections

Respiratory infections are common among cruise ship passengers. Travellers from areas of the world where influenza viruses are in seasonal circulation may introduce such viruses to areas of the world where influenza is not in seasonal circulation. Crew members serving passengers can become reservoirs for influenza infection and transmit disease to passengers on subsequent cruises.

Influenza prevention on cruise ships begins at embarkation with pre-boarding health questionnaires, which can be enhanced by secondary screening by medical personnel of passengers who report flu-like symptoms (fever, runny nose, etc.) or previous contact with a confirmed case of influenza. Passengers who pose a risk may be denied access to their fully paid cruise. Cruise lines also reserve the right to change itineraries. Most cruise lines will provide compensation to passengers on cruises where the itinerary has been significantly affected, but it is advisable to take out 'cancellation for any reason' insurance. In addition, medical staff will isolate and treat passengers and crew with flu symptoms if such a situation arises while the ship is underway. Most cruise ships operating internationally will carry appropriate medication, including antivirals that are effective in treating influenza.

Legionellosis

Legionellosis (Legionnaires' disease) is a potentially fatal form of pneumonia that is usually contracted by inhaling Legionella bacteria. Legionella species can be found in tiny droplets of water (aerosols) or in droplet nuclei (the particles left over after water has evaporated). Over the past three decades, more than 50 outbreaks of legionellosis involving over 200 cases have been linked to ships. Sources have been potable water supplies (e.g. showers), an onboard whirlpool and exposure during port layovers. Prevention and control depend on proper disinfection, filtration and storage of source water, and design of piping systems without dead ends. Regular cleaning and disinfection of spas is necessary to reduce the risk of Legionellosis on ships.

Noncommunicable diseases

Due to temperature and weather variations, changes in diet and physical activity, cruise ship travellers, especially the elderly, may experience a worsening of existing chronic health conditions. Cardiovascular events are the most common cause of death on cruise ships. Motion sickness may occur, particularly on smaller vessels. Mal de Debarquement Syndrome (MdDS) is a rare disorder of perceived motion that most commonly develops after an ocean cruise or other type of water travel. Common symptoms include a *persistent sensation of motion* such as rocking, swaying, tumbling and/or bobbing. This sensation of motion is often associated with anxiety, fatigue, difficulty maintaining balance, unsteadiness, and difficulty concentrating (impaired cognitive function). Most people with MdDS experience relief when driving, riding in a car, on a plane, on a train, or during other physical activities. However, the abnormal sensation of movement returns as soon as the activity is stopped. Early diagnosis may improve recovery. MdDS can last for months to years. Injuries and dental emergencies are also frequently reported.

Safety issues on board

In order to maintain a safe environment, cruise lines have implemented strict ship security procedures, some of which are outlined in internationally agreed measures set out by the International Maritime Organisation (IMO). A cruise ship is inherently safe because it is a controlled environment with limited access. Security measures are now standard on cruise ships and include passenger screening procedures similar to those found at airports, including the use of metal detectors. Once a ship is underway, only documented employees and paying passengers are on board. Cruise lines employ security experts and consultants and train shipboard personnel in security procedures. Many additional security techniques are routinely used by both port and cruise line security, but remain invisible to passengers.

In 2009, the International Maritime Bureau (IMB) reported a total of 406 incidents of piracy and armed robbery against ships, largely confined to the Somali coast, West Africa, South America and Southeast Asia. These were serious and violent attacks carried out by organised crime groups. Sixty-eight crew members were injured and eight crew members were killed in the various incidents. The attacks included a well-publicised unsuccessful attack on a cruise ship and attacks on two catamarans and 6 yachts. Despite the increase in piracy attacks, the number of successful hijackings was proportionally lower in 2009. These lower rates can be directly attributed to the increased presence and coordination of international navies, as well as the heightened awareness and robust actions of the Masters transiting these waters. The cruise industry

quickly adopted security protocols that confirm its enviable safety record, making passenger vessels one of the safest modes of transport.

Precautions

In general, cruise ship travellers should

- **Consult their healthcare provider, physician or travel health specialist before booking if they may require medical treatment abroad**
- **Consult their healthcare provider, doctor or travel health specialist before embarking. This professional should in particular:**
 - **consider the health of the cruise traveller, the duration of the cruise, the countries be visited, and the likely activities ashore;**
 - **provide all necessary, routine and recommended vaccinations, considering not only the itinerary environment but also host factors;**
 - **consider influenza vaccination as available regardless of season, particularly if the traveller is in one of the groups for whom annual influenza vaccination is routinely recommended (Chapter 6); the need to prescribe anti-influenza medication for treatment or prophylaxis can then be discussed;**
 - **prescribe medication, e.g. for**
 - **malaria, if exposure will occur**
 - **motion sickness, especially if the traveller is prone to it**
- **See a dentist to ensure good oral health and no active problems.**
- **Consider taking out travel cancellation, additional medical cover and/or medical evacuation insurance if necessary.**
- **Refrain from embarking on their cruise if they have symptoms of acute illness.**

- **Carry all prescription medication in its original packaging or container, together with a doctor's letter confirming the traveller's need for the medication (Chapter 1).**
- **Wash your hands frequently on board, either with soap and water or with an alcohol-based hand sanitiser.**
- **Avoid self-medication in the event of diarrhoea or high fever on board, but report it immediately to the ship's medical service.**

Further reading

Travel by sea

General information related to travel by seas may be found at the following web sites:

American College of Emergency Physicians: www.acep.org/ACEPmembership.aspx?id=24928

Cruise Lines International Association, Inc.: <http://www.cruising.org/>

EU project: SHIPSAN (assessing the usefulness of a EU Ship Sanitation Programme and coordinated action for the control of communicable diseases in cruise ships and ferries at: www.eu-shipsan.gr

IMHA InfluenzaA (H1N1) interim advice (available at:

http://imha.net/index.php?option=com_content&task=section&id=14&Itemid=73)

International Maritime Health Association: www.imha.net

Dahl E. Medical practice during a world cruise: a descriptive epidemiological study of injury and illness among passengers and crew. *Int Marit Health* 2005; 56(1-4 [PubMed](#)):115-128

Miller JM et al. Cruise ships: high-risk passengers and the global spread of new influenza viruses. *Clinical Infectious Diseases*, 2000, 31:433–438.

Nikolic N et al. Acute gastroenteritis at sea and outbreaks associated with cruises. In: Ericsson CD, DuPont HL, Steffen R, eds. *Traveller's diarrhea*. Hamilton, BC Decker Inc., 2008:136–143.

Sherman CR. Motion sickness: review of causes and preventive strategies. *Journal of Travel Medicine*, 2002, 9:251–256.

Ship sanitation and health. Geneva, World Health organization, February 2002 (available at: www.who.int/mediacentre/factsheets/fs269/en/).

Smith A. Cruise ship medicine. In: Dawood R, ed. *Travellers' health*. Oxford, Oxford University Press, 2002:277–289.

WHO interim technical advice for case management of pandemic (H1N1) 2009 on ships (available at: http://www.who.int/csr/resources/publications/swineflu/guidance_ships/en/index.html).

WHO International medical guide for ships: including the ship's medicine chest, 3rd ed. Geneva, World Health Organization, 2007 (available at: whqlibdoc.who.int/publications/2007/9789241547208_eng.pdf).