

**MEDICAL PRACTICE DURING A WORLD CRUISE: A  
DESCRIPTIVE EPIDEMIOLOGICAL STUDY OF INJURY  
AND ILLNESS AMONG PASSENGERS AND CREW**

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**ABSTRACT**

**Study objective:** To describe the medical practice of one physician and two nurses during a 106-day westward cruise from Los Angeles to New York in 2004 with an average of 464 passengers (51% women) and 615 crew (22% women) aboard.

**Methods:** Patient data were registered continuously and reviewed after the voyage.

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The author has not received any financial support or funding of any kind for this study. He has worked part time for a number of cruise companies as an independent maritime medical consultant and as a ship's doctor.

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**Results:** There were 4,244 recorded patient contacts (= 40 per day), 2,866 of which directly involved the doctor (= 27 per day). Passengers accounted for 59 % of the doctor consultations, while crew accounted for 59% of the nurse consultations. The most frequent consultation cause was respiratory illness (19%) in passengers and skin disorders (27%) in crew. Among 101 reported injuries (56 passengers, 45 crew) wound was the most common type (passengers 41%, crew 40%). The most frequent accident location for passengers was ashore (27%) and for crew galleys aboard (31%). 133 crew were on sick leave for a total of 271 days, and seven were medically signed off, six of them following injuries. Seven passengers and 13 crew were referred to dentists ashore, five passengers and two crew were referred to medical specialists ashore and returned to the ship, while seven passengers and one crew were hospitalized in port.

**Conclusion:** The medical staff on long voyages will have a busy general practice. Broad experience in emergency and general medicine, good communication skills and previous cruise experience are useful qualifications. While the ACEP PREP may be sufficient for shorter cruises, additional equipment is recommended for long voyages.

## STUDY OBJECTIVE

To describe the medical practice of one physician and two nurses during a 106-day westward cruise from Los Angeles to New York in 2004 with an average of 464 passengers (51% women) and 615 crew (22% women) aboard.

## INTRODUCTION

Cruise medicine covers all aspects of medical practice aboard passenger vessels, but there is no international body that regulates medical care aboard [1]. However, the American College of Emergency Physicians (ACEP) published in 1996 “Guidelines of Care for Cruise Ship Medical Facilities” [2], and its Section for Cruise Ship and Maritime Medicine submitted a Policy and Educational Paper (PREP) as an adjunct to ACEP’s policy statement [3]. The regularly updated PREP has become an international reference for practice of cruise medicine [4], but is based upon section members’ consensus rather than documented facts. It was originally developed with short cruises in mind, where the passengers mostly see the ship’s medical staff for emergencies that can’t wait a few days until they can see their own physician. While short cruises tend to repeat the same harbors weekly, all ports during a cruise around the world are new, and

the medical staff will be unfamiliar with their medical facilities, which may be inferior to those at home and even aboard [5,6]. As the ship is often outside helicopter range, the medical staff is on their own for long periods of time. Hence, patient care challenges may be different on cruises of varying duration. In addition, the age of the shipboard population may also impact patient care needs and the level of sophistication necessary within the ship's medical facility.

The author has previously published a report from a 103-day World Cruise in 1997 [5]. Since then, a comprehensive study on medical practice among passengers on predominantly short cruises has been published [6]. The purpose of the present study of a World Cruise in 2004 is to describe the medical practice during another long sea voyage, to identify typical trends by comparing the two long voyages and see how the results differ from short cruises, as well as to describe useful qualifications for medical staff on long voyages. The findings may be of value for medical professionals considering cruise ship work, for future planning of long sea voyages, and for further discussions on international guidelines for cruise medicine.

## MATERIALS AND METHODS

### **Ship and Itinerary**

The World Cruise was a 106-day westward odyssey of over 33,000 miles across 11 seas during the first part of year 2004 from Los Angeles to New York. It was arranged on a large, modern, luxury cruise ship of Bahamian registry, featuring 34 ports in 17 countries on four continents. It was also offered in four divided cruise segments of 26, 22, 29, and 29 days duration. Longest time in port was three days; longest time at sea was seven days.

### **The Medical Center**

The medical center complies with and exceeds ACEP's PREP [3] and is equipped for performance of most simple diagnostic and therapeutic procedures. It comprises waiting areas, reception, doctor's office, pharmacy, laboratory, emergency room (for stabilization, surgery and x-rays), and three 2-bed wards with four beds for intensive care.

The medical staff comprised one physician and two nurses, all Scandinavian-trained. The physician was a board-certified general surgeon with extensive trauma, general practice and cruise medicine experience. The registered nurses were also board-certified nurse anesthetists, and all have previous experience from other cruise lines as well.

A nurse was always on-call. The doctor had separate office hours for passengers and crew twice every day and was on 24-hour call for emergencies at sea.

#### **Data Collection - Passengers and Crew**

There were two distinctly different patient groups onboard: The vacationing passengers who paid for medical services and the working crew who were treated gratis. Passenger and crew data were collected from the official lists of the cruise line.

All crew members had been subjected to standardized pre-employment examinations and were assigned an official crew number. All other persons aboard, including crew family visits, various entertainers, instructors, lecturers, and contracted workers, were registered as passengers.

The following patient data were registered continuously in the medical center and subjected to statistical analyses after completion of the voyage: Sex; number of new and follow-up consultations for illness or injury, divided in doctor and nurse consultations; number of routine crew examinations, drug and alcohol tests, and vaccinations; chief complaint for new consultations; number of injuries resulting in official accident reports; number of “reportable cases” of gastrointestinal illness (GI); number of isolated GI cases and their asymptomatic contacts - and total number of days in isolation; number of patients monitored in wards onboard; number of deaths onboard; number of patients referred to medical and dental specialists ashore; and number of shore-side hospitalizations.

In passengers, other encounters (phone calls, informal follow-up, etc.) by the doctor resulting in medical progress notes were counted.

In crew, the number of crew off work; total number of sick leave days onboard, and number of crew signed off for medical reasons (= medical sign-off) were registered.

Small packs of comfort medication, like acetaminophen, aspirin and meclizine, were distributed free on request from the Front Desk 24 hours a day and from the Medical Center during opening hours without registration.

The patient’s chief complaint was recorded according to a list (see Table 1) of organ systems, similar to previous cruise reports [5,6]. Injury type and accident location were also registered.

A “reportable GI case” was defined according to Centers for Disease Control and Prevention (CDC) as 3 or more loose stools in 24 hours, or vomiting plus one other symptom [7]. Reportable GI cases among passengers and crew and their asymptomatic contacts (room mates) were isolated according to the CDC Vessel Sanitation Program 2000 [7].

#### **Data Collection - Quality Control Program (QCP)**

The ship uses a well-established customer satisfaction system, a quality control program for all groups providing passenger service aboard. One QCP form per

passenger was routinely delivered to the staterooms at the end of all four segments of the World Cruise. Most staterooms were occupied by couples, of which usually only one partner filled out a form. The passengers were asked to rate anonymously both service and friendliness/attitude of all service personnel aboard, including the medical staff, on a scale from Poor to Excellent.

#### **Statistics**

Age was recorded as median, 25th and 75th percentiles, and full range.

The received QCP forms were collected in a designated box at the Front Desk and scanned by the Captain's Office. Completed circles were read by a computer program, giving Poor 2, Fair 4, Good 6, Very Good 8 and Excellent 10 points. The results were presented as percentages and as a decimal score from 2 to 10.

## **RESULTS**

#### **Passenger Characteristics**

The number of passengers aboard varied between 200 and 619, depending on segment and number of participants on overland tours; the average number per day for the whole cruise was 464. A total of 1,193 different passengers, 607 women (51%) and 586 men (49%), were onboard for one or more segments. The women's age ranged from 5 to 94 years, with median age 69 years; 50% were between 59 and 75 years. The men's age ranged from 3 years to 98 years, with median age 68 years; 50% were between 51 and 75 years.

Among the passengers, 31 nationalities were represented, the largest group being North-Americans (71%), followed by Japanese (9%).

The full World Cruise was booked by 179 passengers (108 women =60%, 71 men = 40%). Their median ages were 74 (women) and 77 years (men).

#### **Crew Characteristics**

The number of officers, staff and crew ranged from 595 to 667, with an average of 615 crew per day for the whole cruise. A total of 860 different crew members, 193 women (22%) and 667 men (78%), from 48 different nations worked onboard.

The female crew's age ranged from 21 to 54 years, with median age 28 years, and the male crew's age ranged from 20 to 61 years, with median age 31 years.

#### **Passenger and Crew Consultations and Examinations**

During the 106-day voyage the medical staff had a total of 4,244 recorded patient contacts during 106 days = 40 per day, 2,866 (= 27 per day) of which directly involved the doctor.

The doctor contacts included 34 passenger consultations in connection with yellow fever vaccinations, 46 biennial crew examinations, and 550 ‘other recorded passenger encounters’ (phone calls, informal follow-up etc).

The nurse contacts included 117 yellow fever vaccinations to passengers, 97 influenza, hepatitis, tetanus and yellow fever vaccinations to crew, and 97 drug and/or alcohol tests in crew for pre-employment, random or cause.

Passengers accounted for 59 % of the doctor consultations, while crew accounted for 59% of the nurse consultations.

**Table 1.** Number (%) of new passenger and crew consultations according to the patient’s chief complaint during a 106-day World Cruise.

<b>Disorders</b>	<b>Passengers (%)</b>	<b>Crew (%)</b>	<b>Total (%)</b>
Dermatology	113 (16.9)	218 (27.3)	331 (22.6)
Respiratory	126 (18.8)	145 (18.2)	271 (18.5)
Musculoskeletal	107 (16.0)	108 (13.6)	215 (14.7)
Gastrointestinal	102 (15.2)	109 (13.7)	211 (14.4)
Cardiovascular	74 (11.0)	13 (1.6)	87 (5.9)
Urogenital	11 (1.6)	69 (8.7)	80 (5.4)
Other	137 (20.5)	135 (16.9)	272 (18.5)
<b>Total</b>	<b>670 (100)</b>	<b>797 (100)</b>	<b>1,467 (100)</b>

A total of 1467 consultations (46% passengers, 54% crew) were registered as “new” (= first visit for a new ‘chief complaint’) (Table 1). Among the new passenger visits, 56% were by women and 44% by men, while 39% of the new crew visits were by women and 61% by men.

A total of 105 X-ray examinations (42 passengers, 63 crew) were performed. Of 60 chest X-rays, 44 were routine crew examinations. A total of 449 blood tests (passengers 214, crew 135) were done aboard, the most frequent being CRP (C-reactive protein; passengers 231, crew 76), followed by hemoglobin in crew (n=56) and INR (International Normalized Ratio) in passengers (n=30).

#### **Types of Illness**

Distribution of ‘chief complaints’ based on new consultations is shown in Table 1. Respiratory problems dominated in passengers and were equally frequent in crew, while skin conditions dominated in crew. Cardiovascular disorders were more often seen in passengers than crew, and skin conditions and urogenital complaints were more frequent in crew, whereas the frequency of gastrointestinal and musculoskeletal disorders was similar in the two groups.

### Gastrointestinal Illness

There were 68 CDC-reportable GI cases (42 passengers, 26 crew). One-hundred-and-three persons were isolated for a total of 246 days: 50 passengers, including 12 asymptomatic contacts, were isolated for 133 days, and 53 crew, including 20 asymptomatic contacts, were isolated for 113 days. This means that an average of 1 person was isolated per day and remained for an average of 2.5 days in isolation.

The percentage of CDC-reportable cases per 7 days varied between 0.2% and 2.2% among passengers and between 0.2% and 0.6% among crew. The highest number of CDC-reportable cases per 7 days was reached while cruising Southern Asia, and most of these patients had eaten ashore less than 24 hours prior to symptoms debut.

### Injuries

One-hundred-and-one injuries (56 passengers, 45 crew), about 1 injury a day, were reported (Table 2). Thirty-seven (66%) of the injured passengers and 12 (27%) of the injured crew members were women. The median age (range) of the injured patients was: female passengers 72 (22-92), male passengers 65 (9-82), female crew 28 (25-53), and male crew 29 (22-48) years.

The 101 injuries accounted for a total of 417 consultations, 248 by passengers (= 4.4 consultations per injury) and 169 by crew (= 3.8 consultations per injury). One passenger who sustained bilateral friction wounds from a too tight wheelchair during a shore excursion was seen 16 times by the medical staff. One crew member was seen 18 times following a back injury before he was signed off for medical reasons after 14 days of sick leave. Six crew were medically signed off and repatriated following accidents (see below).

**Table 2.** Distribution of injury types in passengers and crew according to sex during a 106-day World Cruise.

Type of Injury	Passengers (Women)	%	Crew (Women)	%	Total
Wounds	23 (14)	41	18 (2)	40	41
Contusions	20 (16)	36	14 (5)	31	34
Sprains + Strains	5 (2)	9	4 (1)	9	9
Fractures + Dislocations	4 (4)	7	3 (3)	7	7
Burns	0	-	6 (1)	13	6
Foreign bodies	4 (1)	7	0	-	4
<b>Total</b>	56 (37)	100	45 (12)	100	101

**Table 3.** Accident location of passengers and crew according to sex during a 106-day World Cruise.

<b>Accident Location</b>	<b>Passengers (Women)</b>		<b>%</b>	<b>Crew (Women)</b>		<b>%</b>	<b>Total</b>
Ashore	15	(10)	27	5	(3)	11	20
Deck/Stairs/Gangway	13	(7)	23	6	(1)	13	19
Cabin/Balcony	10	(7)	18	7	(6)	16	17
Galley	0	(0)	-	14	(1)	31	14
Corridor	5	(5)	9	4	(0)	9	9
Pool/Spa/Gym	4	(2)	7	2	(1)	4	6
Lounges/Casino	5	(3)	9	1	(0)	2	6
Dining Room	1	(1)	2	3	(0)	7	4
Office/Engine Area	2	(1)	3	2	(0)	5	4
Tender (Life Boat)	1	(1)	2	1	(0)	2	2
<b>Total</b>	<b>56</b>	<b>(37)</b>	<b>100</b>	<b>45</b>	<b>(12)</b>	<b>100</b>	<b>101</b>

The most common injury type (Table 2) was wound both among passengers and crew, but the treatment differed: while most of the wounds (57%) in passengers were closed with steristrips and/or tissue glue, 61 % of the wounds in crew were closed with sutures.

The most frequent accident location for passengers was ashore (27%) and for crew galleys aboard (31%) (Table 3).

#### **Evacuations at Sea and Deaths**

There were no emergency evacuations while the ship was at sea, and as one passenger with cardiac arrest was successfully resuscitated aboard and hospitalized ashore, there was no death aboard.

#### **Passengers – Ward Observations Aboard, Hospitalizations and Medical Referrals in Port**

Seven passengers were admitted to wards aboard for 1.5 hours - 2 days: myocardial infarction (n=2), respiratory distress (n=1), cerebral insult (n=1), confusion (cerebral edema caused by hyponatremia; n=1), incarcerated hernia (n=1), and foreign body in esophagus (n=1).



**Table 4.** Interactions with shore-side medical facilities regarding passengers and crew during a 106-day World Cruise.

Type of referral	Passengers	Crew	Total
Hospitalization in port	7	1*)	8
To medical specialist in port	5	2	7
To medical specialist at home during vacation	-	8	8
To dentist in port	7	13	20
Blood sample to laboratory in port	6**)	2	8
Medicines ordered from port pharmacy	42	1	43
Medical sign-off and repatriation	--	6	6

\*) Also medical sign-off and later repatriation; \*\*) 5 times for 1 passenger

Seven passengers were hospitalized ashore: Six of those admitted to wards aboard, plus one hospitalized directly for emergency psychiatry (Table 4).

Another 12 passengers returned to the ship following specialist consultations in ports: Two were referred to local emergency departments while the ship's doctor was ashore (facial injuries, esophageal obstruction), one to dermatologist (rash), two to ophthalmologists (vitreal bleedings), and seven to dentists. Blood samples were sent to port laboratories for elective tests unavailable aboard once for one and five times for another passenger (Table 4).

**Crew – Sick Leave, Ward Observations Aboard, Hospitalizations Ashore, Medical Sign-Off and Repatriation, and Medical Referrals in Port**

One-hundred-and-thirty-three crew were on sick leave for a total of 271 (0.5-14) days (= 2.6 of 615 crew per day = 0.4%). The 45 crew with injuries were off work for a total of 59 days onboard (=1.3 days of sick leave onboard per injury), and six were eventually medically signed off after 0-14 days off work.

Only two crew members were admitted to wards aboard: one with acute abdominal pain (2 hours), and one with chronic fatigue syndrome, triggered by a minor head injury, for intravenous fluids - 3 hours a day for a week. The latter and six other crew members (back pain 3, fractures 2, and gynecological disorder 1) were medically signed off, but only one of them (leg fracture sustained on a beach) was hospitalized in port before repatriation (Table 4).

Fifteen crew returned to the ship following specialist consultations in ports: One saw a radiologist (MRI column), one a gynecologist (discharge), and 13 dentists. Another eight crew were referred to various medical specialists during scheduled vacation (dermatology 2; ENT, orthopedic surgeon, gastroenterologist, plastic surgeon, neurologist and gynecologist: one each) (Table 4).

Crew data from this study are included and discussed in more detail in a separate one-year study on sick leave aboard [8].

### **Passenger Satisfaction**

During the World Cruise a total of 486 QCP forms could be processed, of which 278 forms (57%) rated the service and 200 (41%) the friendliness/attitude of the medical staff. The accumulated average rating was 9.69 (88.5% Excellent, 7.9% Very Good) and 9.73 (90% Excellent, 7% Very Good), respectively.

## DISCUSSION

Members of CLIA (Cruise Lines International Association), the industry's marketing organization, in 2004 operated 184 ships with a total of 215,405 lower berths. In 2004 the projected figure for North American passengers sailing in North American cruise-industry ships was expected to reach a record 10.6 million, according to CLIA [9]. However, about 87 percent take cruises from one to eight days, while cruises of 18 days or longer account for about one-half of one percent [9].

Long voyages may lead to a different type of doctor-patient relationship for the passengers than short cruises. On shorter trips, with far less crew than passengers, an estimated 60 per cent of the physician visits are by crew [6], suggesting that the crew regard the ship's doctor as their convenient family physician, while for most passengers the ship's medical center primarily serves as their emergency room. On long cruises, the ship's doctor may be perceived and used by both passengers and crew as their family physician while aboard, suggested by a similar high number of 'first consultations' and a high follow-up rate in the two equally sized groups of the present study. Furthermore, compared to shorter cruises [6], the consultation rate was high, which may also to a certain degree reflect the cruise line's stated goal of 'a safe, healthy, secure and caring ship environment'. The medical staff members were expected to contribute by providing "professional service with a warm and caring attitude". The passenger QCP polls imply that they fulfilled these expectations. Although the satisfaction survey was meant for routine quality control and not research, the rather uniform response gives an indication of the passengers' opinion of the medical staff and of the medical center's image.

The registered 'chief complaints' of the patients reflect the doctor's generalist orientation. Mental and social conditions were included in the category "Other Disorders" (Table 1), which might have been even larger with a psychiatrist as the ship's physician.

Although less common in the present than in previous cruise series [5,6], respiratory-related complaints were still the most frequently encountered medical problem among the passengers, and as in another world cruise series [5] number two in crew, surpassed only by skin conditions. More than 85% of the crew had been vaccinated against influenza before the World Cruise started, and unvaccinated crew were immunized upon arrival to reduce sick leave and to eliminate the risk of ill crew contaminating old and frail passengers. This study was not designed to evaluate the vaccination program, but the average number of sick leave days stayed low, and no crew with respiratory symptoms and fever tested positive for influenza A or B.

Gastroenteritis, in particular when caused by the easily person-to-person transmitted norovirus, has caused growing concerns in the cruise industry [10], and before the present World Cruise an extensive sanitary program had been instituted. It included a strict isolation program [7], resulting in an average of one person a day being isolated and 2.5 persons to be in isolation per day during the study. The frequency of gastrointestinal tract complaints was, as in 1997 [5], similar in passengers and crew and not higher in the present series. However, the isolation policy of CDC-reportable GI cases and their asymptomatic contacts significantly changed the medical practice aboard and can explain the doubling of average crew sick leave, from 0.2% in 1997 [5] to 0.4% in 2004. The ship's physician's unwanted role of warden put an initial strain on the doctor-patient relationship, but again frequent follow-ups and diplomacy may have worked, if the QCP results can be used as an indicator.

Only during one segment did the number of GI cases reach 2% of the passengers. This happened while the ship was in a previously reported high risk [5]. More strict measures of sanitation were then instituted according to the ship's GI protocol, and the number of cases quickly fell to baseline.

When a GI patient put herself on a strict water diet and developed cerebral edema, it proved useful to be able to measure serum sodium, and potassium levels were important in many cases. Measurement of electrolytes exceeds the recommendations of the ACEP PREP [3], as do INR and cardiac enzymes; tests critical for making decisions regarding helicopter evacuation, ship deviation - or ward discharge.

No patients were evacuated by helicopter. Only few patients were admitted to ward monitoring aboard and/or hospitalization in port, but they demonstrated the usefulness of equipment recommended by the ACEP PREP [3], like EKG, cardiac monitor, defibrillator, oxygen, airway equipment, infusion pump, pulse oximeter and X-ray equipment. Thrombolytics would also have been considered if the two myocardial infarctions had occurred at sea.

Injuries represented 8% of new passenger and 6% of new crew consultations. The even higher percentage (12-18%) of passenger consultations from injuries during short

cruises [6,11] may reflect that passengers on short cruises visit the ship's medical facilities mostly for emergencies. However, the percentage of injury consultations was higher than in the 1997 series (passengers 4%, crew 1%) [5], which, paradoxically, may be the result of better recording rather than a more dangerous shipboard environment. Every injury reported to a medical staff member, regardless how minor, triggered an injury report, all such accidents were investigated by the safety officer, and the patients' condition was closely followed. Thus, as a group, injuries created relatively much work.

As in shorter cruises [6], wound was the most common type of passenger and crew injury, but while the typical crew wound required sutures, most passenger wounds were superficial atrophic skin lacerations which healed fast without scars when treated carefully as skin transplants. Being used to cut off such loose skin flaps, patients pleased with the attention and results quickly spread the word, which created goodwill and further increased the number of such reported injuries.

One of four passenger accidents happened ashore, the 'cruise area' over which the ship had the least control. This is less than in 1997 [5], but more than reported from shorter cruises (15%) [6]. Decks, stairs and gangways were responsible for one of four passenger injuries, while the galleys - with their occasional wet and slippery floors, rushed atmosphere and sharp equipment - accounted for almost one third of crew injuries.

While no passengers were disembarked because of injuries, six of the seven crew members signed off for medical reasons were repatriated following accidents. Crew who can't work for some time, must be replaced [8]. However, this is more difficult from remote areas, and recuperation aboard was attempted for longer periods than customary on short cruises. Injured passengers on short cruises are often disembarked in the first port. But during the World Cruise injured passengers who didn't need specialized facilities for treatment, often chose to recover aboard and found the available service and frequent follow-ups superior to care they could expect to receive in their homes ashore. Both were factors contributing to more consultations.

However, if ward monitoring becomes necessary, or if simple daily activities can't be properly handled by the patient or a competent travel companion, even minor ailments will cause hospitalization in the next port because of the limited medical manpower aboard. Hotel staff is not permitted to assist during showers or baths, and dining room staff can't be allowed to dispense medication at meals, so cruise ship care is not an acceptable alternative to assisted living facilities, contrary to a recent suggestion [12].

Passengers with tooth ache were disappointed not to get expert help on board, but only 20 dentist referrals, about one per week, hardly justify keeping a resident ship's dentist aboard.

Referrals of passengers and crew to other specialists ashore were rare and less frequent than reported from short cruises [6], which may reflect the patients' confidence in the ship's medical center, but also the doctor's frustrating experiences during past visits to unfamiliar ports. During short cruises with regular visits to the same ports, it is easier to establish flexible referral systems.

Based on shorter cruises, Peake et al. [6] suggested that an emergency physician is ideally suited for the duties of a cruise ship physician and - with an average passenger age of 56 years - the doctor should also be particularly skilled in the care of older patients. The present study shows that the passengers are even older on longer voyages.

ACEP's PREP recommends that a cruise ship physician should be board-certified in emergency medicine, family practice or internal medicine or have 2-3 years of clinical experience in general practice plus emergency / critical care [3]. Such professional backgrounds would be sufficient to handle the medical challenges encountered in the present study. But many responsibilities during long voyages are 'sea-specific', especially regarding chain-of-command and communication, and therefore previous successful cruise contracts are particularly valuable.

In conclusion, the physician on longer voyages must be prepared to handle a busy general practice, where close follow-up and high degree of patient satisfaction are crucial components. Broad experience in emergency and general medicine, as well as diplomatic and communication skills, are musts. Previous cruise contracts and extra training in geriatrics, dermatology, psychiatry and public health are particularly useful. While the ACEP PREP may be sufficient for short cruises, additional equipment is necessary for longer voyages. Passengers with conditions that may require sophisticated medical care or urgent evacuation should be discouraged from cruising outside helicopter range. The passengers' expectations should be kept realistic: the number of medical staff is limited aboard, the ship's medical center is not a hospital, and medical port facilities are often not up to US standards. A World Cruise is an adventure, but no vacation for a solo ship's physician, for whom the vessel itself must be considered the main destination, with occasional visits to foreign ports just an added bonus.

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