

## AIR TRAVEL

---

### INTRODUCTION

#### Hazards of Airline Travel

Airline travel is normally fast, convenient, and safe. However, hassles at the airport and delayed flights can cause stress; the environment in the cabin may cause discomfort; ongoing health problems may cause inconvenience or be aggravated; and long-haul flights carry additional hazards.

#### Planning Ahead

To minimize hazards, there are a number of air travel-related health issues to assess during the pre-travel consultation. These include general fitness to fly, acute medical conditions or exacerbation of chronic conditions whereby delay of the trip should be contemplated, advisability of compression stockings to prevent venous thrombosis, and whether the air itinerary and involved airlines can accommodate physical disabilities and oxygen needs.

At the consultation, the traveler should be reminded to carry regular medications in carry-on luggage, to wear loose, comfortable clothing and comfortable shoes that have been worn previously, and to register online with the State Department in case of an emergency, disaster or for evacuation coordination. See: <https://travelregistration.state.gov/ibrs/home.asp>.

### FITNESS TO FLY

#### Ongoing Health Problems

The travel advisor is not in a position to understand the complexities of ongoing medical issues; therefore, it is wise for the traveler to seek medical clearance from his or her usual health care provider before travel if he or she is ill, has recently undergone surgery, has sickle cell disease or trait, has other chronic medical or psychiatric conditions, or has a history of deep vein thrombosis. Persons who have already made travel plans frequently minimize their conditions or exaggerate the clearances (if any) that have been obtained, so if inconsistencies are apparent, a discussion with the treating health care provider may be warranted.

Airlines strongly recommend that persons with serious health problems discuss these issues with the airlines in advance of travel. The traveler should explain the medical issue to a reservations agent who can forward the inquiry appropriately to ensure that adequate facilities are provided, including wheelchair access, diet, and extra oxygen where necessary.

- Oxygen requirements should be assessed, keeping in mind that airliner cabins are pressurized to 1500-2400 m (5,000-8,000 ft) above sea level. There are no regulations requiring that airlines provide medical oxygen during flights. Be sure to check with the airline well in advance of departure to see what their rules are and to make necessary arrangements.
- Some airlines may not allow passengers to carry on FAA-approved devices (see *Pulmonary Disease and Air Travel*) and require, instead, that passengers use the airline's onboard oxygen. Other airlines may allow passengers to use their own oxygen while on the runway but require that they switch to the plane's oxygen once on board. If oxygen is needed on the ground, travelers must arrange their own oxygen supplies for en route.

Cardiovascular, respiratory, and other chronic disorders should be stabilized and correctly managed before travel. Travelers with severe pulmonary or cardiovascular disease, or who have recently undergone surgery, may need specific formal medical assessment before flying. See *Cardiovascular Disease and Air Travel* and *Pulmonary Disease and Air Travel*. Also see the table "Restrictions on Flying after Illness or Surgery" located in Related Resources.

Barotrauma most frequently affects the middle ear, when pressures cannot be equalized with the nasopharynx across the Eustachian tube during ascent and descent. Travelers should consider not flying if they have had recent middle ear surgery, severe congestion, infection, or recent severe sinusitis. Repeated ear or sinus barotrauma following air travel should be managed with prophylactic medication such as oral or nasal decongestants or pseudoephedrine tablets and good hydration maintained.

Trapped air expands during flight. Travelers sensitive to abdominal bloating should avoid carbonated beverages and foods that can

increase gas production. Travelers with recent surgery, particularly intra-abdominal, neurologic, intrapulmonary, or intraocular procedures, should consult with their providers before flying.

Public health officials encourage delay of travel for any respiratory illness; however, in most cases, travelers with simple colds or coughs can usually fly, remembering to observe good personal and cough hygiene. Persons with an active communicable disease other than a cold or cough should delay flying until they are no longer infectious. Chickenpox, measles, influenza, tuberculosis, and gastroenteritis are of particular concern to airlines.

Persons with psychiatric disorders whose behavior is unpredictable, aggressive, disorganized, disruptive, or unsafe should not travel by air. Patients with psychotic disorders who are stabilized on medication and accompanied by a knowledgeable companion may be able to fly.

Also see the table "Restrictions on Flying after Illness or Surgery" located in Related Resources.

## Disability

Most countries have legislation in place to guarantee access to air travel for passengers with disabilities; however, aircraft with fewer than 30 seats are generally exempt from these requirements. Aircraft with more than 60 seats must have an onboard wheelchair, and flight attendants must help move the wheelchair from a seat to the lavatory area. However, flight attendants are not required to transfer passengers from wheelchair to wheelchair, wheelchair to aircraft seat, or wheelchair to lavatory seat. In addition, airline personnel are not obliged to assist with feeding, visiting the lavatory, or dispensing medication to travelers. Check with the airlines about flying with a disability. Travelers with disabilities who require assistance should not travel alone.

## Pregnancy

In the absence of contraindications (medical or obstetrical), pregnant women can safely fly up to the end of 36 weeks' gestation. Air travel during the final month of pregnancy is generally prohibited by airlines, and women who plan to fly during this time should be instructed to inquire about restrictions by each individual airline. In addition, a woman who plans to fly any time during the last 3 months of pregnancy should obtain a letter from her obstetrician indicating her due date, in case airline officials require confirmation.

Relative contraindications for air travel include risk of pre-term delivery, pregnancy-induced hypertension, poorly controlled diabetes, sickle cell trait or disease, and other serious medical conditions. Long flights are also associated with a certain degree of immobility and venous stasis. Aisle seats promote ambulation and are recommended for all travelers at increased risk of thrombosis. Compression stockings have shown efficacy in preventing DVTs and may be recommended to pregnant travelers. Seat belts should be worn low around the pelvis and throughout the flight.

For more information, see *Pregnant Travelers*.

## Infants and Children

Healthy, full-term newborns need not be restricted from air travel based on concern about alveolar development. Some airlines, nevertheless, have minimum age requirements for flying, generally age 1-2 weeks; some require a medical clearance letter for children aged < 2 weeks.

- On domestic flights, the Federal Aviation Administration (FAA) *requires* all children aged  $\geq 2$  years to purchase a ticket and occupy their own seat on an aircraft.
  - A child weighing < 18 kg (< 40 lb), regardless of age, is *recommended* to use an approved child-restraint seat (CRS). Purchasing a separate ticket for a child is the only way to guarantee the ability to use a CRS. (See details on the use of CRS in *Children and Travel*.)
- On international flights, airlines vary as to requirements to purchase a seat for a child aged < 2 years, but a CRS must be used for any children in their own seat unable to support themselves in a sitting position; some airlines require a CRS for all children under a certain weight occupying their own seats. Some airlines provide a sleeping bassinet for infants up to 14 kg (31 lb) for use in flight. All airlines require infants aged > 2 years to purchase a regular airline seat.
- A lap child must be held without any additional tie-ins or restraints during taxi, takeoff, and landing.

Infants and toddlers usually have poor Eustachian tube function and often have bouts of otitis media, which can increase the risk of ear pain, especially during descent. Ear pain may be alleviated by yawning, chewing (gum or sweets), or swallowing (bottle or breastfeeding), sucking on a pacifier, or drinking from a cup, as age-appropriate. A warm towel over the ear may also help. Pseudoephedrine, antihistamines, and other decongestants are banned for use in children aged < 4 years in the United States and < 6 years in Canada. There is little evidence of efficacy in children aged < 12 years, and many expert pediatricians recommend against

their use up to this age due to the potential for adverse effects.

In-flight sedation for young children is not recommended; diphenhydramine and dimenhydrinate, which had been used for this in the past, are not recommended in children aged < 12 years. For motion sickness, scopolamine is an option for children aged  $\geq$  12 years.

Other preventive measures include sitting in the most stable part of a plane or vehicle and avoiding reading.

## Flying after Diving

Armed with an understanding of decompression sickness (DCS) and the risks of an overly rapid ascent, it should be clear that flying ("ascending") too soon after diving carries the risk of precipitating an episode of DCS. This is particularly true for flying after diving while at high altitudes. Unfortunately, there are little data on which to base solid recommendations, so the following guidelines represent the current "best guess" suggestions for advising a diver who will be flying:

### Recommended Surface Intervals for Flying after Diving

- Wait 12 hours after a non-decompression dive before flying.
- Wait 24 hours or more after a dive requiring a decompression stop.
- Wait 18-24 hours or more for divers who make daily, multiple dives for several days.

## IN-FLIGHT ISSUES

### Cabin Environment

Travelers have little to no control over the cabin environment.

Commercial aircraft are pressurized to cabin altitudes up to 2,400 m (8,000 ft), or 1,800 m (6,000 ft) in the case of the Boeing 787 Dreamliner. At 8,000 ft, the partial pressure of oxygen falls to the equivalent of breathing 15.1% oxygen at sea level (normal 21%). This has 2 effects: less oxygen is available because the pressure of oxygen becomes lower, and gas within the body cavities expands causing abdominal discomfort. Both of these phenomena are usually well tolerated by healthy passengers but may cause problems for travelers with severe cardiac or respiratory disease. (See *Cardiovascular Disease and Air Travel*.) These passengers should consult their physicians before air travel to evaluate their fitness to travel and to determine if there is a need for supplemental medical oxygen or other special assistance. Medical oxygen can be arranged with most airlines. Pre-approved portable oxygen generators may be used while on board. Check with the carrier several days in advance of the flight.

Modern airliners recirculate their cabin air 20-30 times per hour compared to 12-15 for most office buildings. Recycled air passes through high-efficiency HEPA filters, which trap 99.9% of particles (bacteria, fungi, and larger viruses) 0.1-0.3  $\mu\text{m}$  in diameter. Air flows from side to side across the plane in limited segments with little circulation along the length of the airplane. As a result, the air cabin environment is not conducive to the spread of most infectious diseases.

However, there are rare cases where airborne diseases have been transmitted to travelers within a 2-seat range (in back, front, and beside) of an infectious traveler. Gastroenteritis due to the highly infectious norovirus is easily transmitted through infected fomites. Because transmission of gastrointestinal and some respiratory pathogens is by direct contact, travelers should be reminded to wash their hands frequently and thoroughly (or use an alcohol-based hand sanitizer containing  $\geq$  60% alcohol), especially after using the toilet and before preparing or eating food, and to cover their noses and mouths when coughing or sneezing.

Humidity in the cabin is usually low, in the range of 20%. There is no specific risk to health, but dry air can cause mild discomfort, particularly dry skin and eye irritation for sensitive people. Travelers should stay hydrated by drinking water and limiting consumption of alcohol, tea, and coffee; consider wearing glasses instead of contact lenses; and use a skin moisturizer and eye drops.

Ionizing radiation levels in flight vary with altitude and latitude but may be 6 times higher at cruise altitudes of 12,200 m (40,000 ft), as compared to sea level. Frequent flyers such as business travelers or cabin staff would need to fly at least 2,000 hours a year for maximum exposures to exceed the internationally recommended ionizing radiation limit; however, pregnant women should be advised to limit flying on subsonic aircraft to less than 200 hours during the pregnancy to reduce exposure.

### Barotrauma

During ascent and descent, air in the middle ear and nasal sinuses will expand or contract. To facilitate the free flow of air and prevent pain, particularly on descent, it is helpful to periodically swallow, chew, or yawn. Offer a drink to young children or a pacifier to infants.

## Disinsection

Some countries, but not the U.S., require disinsection of all or certain inbound flights. This is done in 1 of 3 ways:

- Spraying the interior of the aircraft cabin with an aerosolized insecticide with passengers still on board, usually at the top of descent. Asthmatic exacerbations and dermatologic conditions due to such aerosolized sprays are not proven.
- Treating the interior surfaces of the aircraft with a residual surface insecticide of 2% permethrin while passengers are not on board. The levels of permethrin in cabin air after residual application are so low as to be of no threat to passengers. Most airlines use this method.
- Spraying the aircraft with aerosolized insecticide with no passengers on board.

Travelers should check on disinsection requirements with the travel agent or airline reservation agent when booking flights.

## SLEEP DEPRIVATION AND JET LAG

On flights that cross 3 or more time zones, depending to some extent on the direction of the flight, sleep deprivation can be a significant problem, especially for the business traveler. Lack of sleep may adversely affect vigilance, attention, memory, and reasoning. Alterations in mood may affect attitude, interpersonal relationships, and behavioral coping. These changes leave the traveler open to errors of judgement and a variety of risks. Jet lag may compound the problem and contribute its own complications. Jet lag contributes to sleep deprivation because the mismatch in time clocks causes fragmented sleep. Jet lag is worse after eastward flights because the phase advances 57 min/day, compared with the phase delay of 92 min/day flying westward. Preventive strategies include adjustment of sleep patterns, timed exposure to bright light, melatonin, and careful use of a hypnotic or stimulant.

## Melatonin and Timed Light Exposure

Jet lag symptoms are associated with the misalignment of the body's normal day/night rhythm. The body normally has a cycle in which melatonin (a natural hormone that aligns sleep cycles and other physiological functions) reaches peak blood levels at around 2:00 a.m. When crossing time zones, this peak needs to be adjusted (shifted) so that it always peaks at this time of the night. Symptoms include sleep disturbances, daytime fatigue, weakness, headache, sleepiness, and irritability. Most symptoms disappear by the fifth day after traveling across a 6-hour time zone. It is difficult to compensate for jet lag for trips shorter than 3 days, and some would advise against attempting to do so.

Complicated multi-day melatonin regimens have been described but most are impractical. To date, it has not proved possible to prevent jet lag, but its effects can be mitigated and its duration reduced by treatment with exposure to light, timed melatonin, and judicious use of hypnotic medication (see below). Treatment can be recommended for flights crossing 3 or more time zones. Efficacy has not been studied beyond 8 time zones. In principle, for travelers flying eastward, 0.5-5 mg melatonin (the optimal dose has not been determined) should be taken at destination bedtime, followed by exposure to bright light early the following morning, maintaining the regimen until fully adapted. Some authorities recommend starting this regimen up to 3 days before departure, but the benefit has not been proven. Travelers flying westward should be exposed to bright light in the early morning. A commercial light box may be used if there is no access to natural light. Even ordinary room light may help.

## Cautions

Travelers should be advised that melatonin can produce sleepiness and reduced alertness. Persons taking melatonin should not drive, operate heavy machinery, or perform tasks requiring alertness for 4 to 5 hours after taking melatonin. The timing of the dose of melatonin needs to be precise, as mistiming the dose can worsen rather than improve the jet lag symptoms. Persons who suffer from psychiatric problems or migraine headaches or who may be pregnant or intend to become pregnant should use melatonin with caution, if at all.

Melatonin is considered a food supplement in the U.S.; however, because food supplements are unregulated by the FDA as to actual content of the active ingredient, the use of melatonin is considered controversial by some authorities.

## Zolpidem (Ambien) and Other Hypnotics

Zolpidem (5 or 10 mg standard formulation; 6.25 or 12.5 mg extended-release formulation) has been shown to be as effective as melatonin alone or as melatonin/zolpidem in combination. Zolpidem should be used to induce sleep after arrival at the appropriate destination time-zone sleeping time, when the body is jet-lagged and cannot fall asleep. It can be used for up to 2 or 3 nights at each

end of the trip.

Standard formulation zolpidem has a short half-life; however, blood levels in some persons may be high in the morning, whether taking low or high doses, resulting in morning impairment in activities that require full alertness (e.g., driving). Extended release zolpidem (regardless of dose) has a longer half-life and can result in day-long impairment in activities that require full alertness. Use the lowest effective dose. In addition, women have a slower clearance rate than men. Dosage recommendations are as follows:

- The recommended dose for women is 5 mg standard formulation and 6.25 mg extended-release formulation.
- The recommended dose for men is 5 or 10 mg standard formulation and 6.25 or 12.5 mg extended-release formulation.

Travelers should be advised to resist the temptation to sleep during daytime hours for the first few days at destination, as this will decrease the ability to sleep at night and prolong the adjustment cycle. Other short-active hypnotics have been recommended (zaleplon, temazepam, and triazolam) but have not been studied formally in the way that zolpidem has. Sedatives are no longer recommended on airline flights due to the risk of blood clots in the legs during prolonged immobility.

### Other Ways to Reduce Jet Lag

Travelers should also be advised on these additional ways of trying to reduce jet lag:

- When possible, choose daytime flights to minimize loss of sleep and fatigue.
- Avoid large fatty meals, caffeine, and alcohol during the flight.
- Drink lots of water.
- Regular timed exposure to daytime outdoor light or high intensity artificial light (> 10,000 LUX) can be useful in improving jet lag.
- There is no current evidence to the usefulness of homeopathic remedies or diet in the treatment or prevention of jet lag.
- Mild stimulants such as caffeine may combat daytime drowsiness.
- Stronger stimulants such as modafinil and armodafinil may also combat daytime drowsiness but have a slow onset of action, have many drug interactions, and are not indicated for typical travelers.
- Synthetic melatonin agonists (ramelteon, tasimelteon, agomelatine) have some chronobiotic properties but are untested for jet lag.

### TRAVELER'S THROMBOSIS

See *Traveler's Thrombosis* for detailed clinical and background material.

Duration of flight, environmental or cabin factors, and personal risk factors affect the risk of venous thrombosis on flights. Prevention is vitally important. Venous thromboembolism (VTE) is extremely uncommon in healthy young adults without personal risk factors.

During long-haul flights, blood flow in the legs is reduced. Obesity aggravates the situation. In most people, clotting mechanisms are well regulated, but a few individuals have an inherited disorder known as thrombophilia, in which the blood is more liable to clot. Other, acquired, causes of increased tendency to clot include recent trauma, major surgery, smoking tobacco, late pregnancy (which may also constrict pelvic veins) and the first 6 weeks postpartum, malignant disease, chronic inflammatory disease, some acquired disorders of clotting regulation, and medication with hormones taken for oral contraception or female hormone replacement therapy (HRT). Symptoms of VTE commonly develop during or immediately after flight. One in three cases of VTE triggered by flying occurs during the first week after travel and the remainder within 8 weeks.

### Epidemiology and Risk Factors

The absolute risk of VTE among healthy adult employees has been calculated as 1/6,000 for a flight of 4 hours.

#### ***Flight Duration***

Compared with not flying, cumulative flying times > 12 hours within the previous 4 weeks and flying > 4 hours in a single stretch are associated with increases in the risk of VTE: odds ratios (OR) 3 and 2, respectively. The impact of increased risk due to duration of flight is no longer apparent 12 weeks after flying. Prospective studies using sensitive tests show that on long haul flights of ~ 10 hours, about 2-3% of all passengers get calf thromboses and about 1% develop DVT, of whom half develop PE. The rate of clinically apparent VTE is much lower because the great majority of these events are asymptomatic. Rates of PE taken from less-sensitive retrospective studies show a clear correlation with distance or duration of flight: virtually none in flights < 6 hours, 0.52 per million for

flights of 6-8 hours, 1.65 per million for flights > 8 hours, and ~ 5 per million for flights longer than about 10 hours. Overall, PE occurs in about 0.4 per million airline passengers and is fatal in about 2% cases.

### ***Environmental or Cabin Factors***

Inactivity during flight may be as important as distance flown. One study showed that 53 of 56 patients who developed PE never left their seats during the flight. Sitting in a window seat carries a greater risk than sitting in an aisle seat (OR 2.2). Every hour slept increases risk of VTE by 10%. Inactivity is more important than class of travel; flying business class reduces risk only slightly (OR 0.7). The potential benefits of flying business class (more cabin space, easier access to the aisle, and more comfortable seating) are lost if the passenger does not make use of them to walk and to exercise. Dehydration from not drinking enough fluids and aggravated by a dry cabin atmosphere is another logical but unconfirmed cabin-related factor.

### ***Personal Risk Factors***

Personal risk factors for VTE associated with flying, with ORs where known, include:

- Age > 50 years
- Being obese (BMI > 30; OR 2.7) or overweight (BMI 25-30; OR 1.5 )
- Being tall (height > 1.9 m or 6.2 ft; OR 6.8) or short (height < 1.6 m or 5.2 ft; OR 4.9)
- Late pregnancy or the first 6 weeks after childbirth
- Chronic venous insufficiency or large varicose veins
- A previous episode of VTE (OR 9.3) or a family history of VTE
- Surgery within the preceding 4-6 weeks: low risk (day case or overnight; OR 5.4); moderate risk (between low and high risk; OR 37.6); high risk (orthopedic, cancer, or > 4 days in hospital; OR 141.7)
- Significant trauma or prolonged immobilization (includes limb casts) in the last 6 weeks
- Cancer within the last 2 years or currently receiving chemotherapy
- Estrogen-containing medication taken for oral contraception (OR 4-40 in different studies), female hormone replacement therapy (HRT), or anti-estrogen therapy (Tamoxifen)
- Disorders of coagulation: notably increased levels of coagulation factor FVIII, (OR 5), FII (OR 2) or presence of FVL mutation (OR 4.5-14 in different studies)
- A personal or family history of thrombophilia (coagulation disorder predisposing to thrombosis; OR 2)
- Failure to take preventive measures

These risk factors act in concert. To determine the risk for an individual passenger, relevant known ORs should be multiplied. For example, sitting inactive throughout the flight in a window seat would at least double this risk. It is difficult, however, to translate the OR figure into a meaningful incidence figure.

### **Prevention Strategies**

VTE is due to venous stasis in individuals with pre-existing risk factors. Risk is amplified by duration of flight. Prevention of venous stasis is the most important measure.

### ***Cabin-Related or Environmental Factors***

There are few hard data on efficacy of interventions to prevent VTE. Advise all travelers flying for more than 4-6 hours to:

- Wear comfortable, loose-fitting clothing that is not tight at the knees or waist.
- Several studies have shown that at-risk passengers who wore below-the-knee elastic compression stockings on flights of > 8 hours' duration were approximately 6-20 times less likely to develop VTE than passengers who did not wear stockings.
- Get up and walk around the cabin hourly, if possible. This is easiest from an aisle seat.
- Stand up and perform stretch exercises; many airlines provide a video presentation of suitable exercises.
- While seated, exercise the calf and thigh muscles by flexing and extending the ankles and knees.
- Avoid sitting with legs crossed.
- Use a footrest when possible to reduce pressure on the backs of the thighs or calves.
- At transit stops get up and walk around.
- Drink enough water to maintain a flow of pale lemon-yellow-colored urine.
- There is no evidence that modest intake of alcohol is a risk factor for VTE. One glass of water is enough to counter the diuretic

effect of 2 units of alcohol (e.g., a double whiskey). Avoid excess alcohol as it may cause sleepiness.

- There is no evidence that moderate intake of coffee is diuretic or is harmful.
- Avoid sleeping pills and sedatives.

### **Personal Factors**

- Advise regular long-haul flyers, especially those aged > 50 years, to be fully assessed by their physician for possible risk factors for VTE and to consider the advisability of thrombophilia screening.
- In persons at moderate risk (previous DVT, recent minor surgery, thrombophilia, pregnancy, obesity, age > 50 years) wear graded compression stockings that fit well and exert 20-30 mm Hg at the ankle, and book an aisle seat.
- In persons at highest risk (recent significant surgery, recent DVT, previous DVT with additional risk factors), consider the possible value of an injection of low molecular weight heparin 2-4 hours before a long-haul flight and on the morning of the following day, with the understanding that only scant data support this approach.
- Patients receiving blood thinners (e.g., Coumadin, Warfarin) should have their clotting test result checked before flight.

## **IN-FLIGHT MEDICAL EMERGENCIES**

### **Handling Emergencies**

Worldwide, an estimated 44,000 in-flight medical emergencies occur annually, a rate of 1 per 604 flights. Most emergencies are managed by passenger physicians and health care workers in collaboration with flight attendants or by phone link with a physician-directed medical communications center. Simple remedies usually suffice. One in ten patients may require hospital admission upon landing. The overall mortality rate is 0.3%. Airline passengers who are also health care professionals should be aware of their potential role as volunteer responders to in-flight emergencies and should be familiar with the facilities available for management. (See Literature Watch Review: *Medical Emergencies on Commercial Airline Flights.*)

### **Aircraft Emergency Medical Kits**

The standard of provision of content of emergency kits aboard aircraft is laid down for European-based airlines by European Joint Aviation Requirements and for U.S.-based airlines by the 66 Federal Regulation 19044. In the U.S. all ATA (Air Transport Aviation) member airlines (includes all major U.S. carriers) carry automated external defibrillators (AEDs), a variable number of first aid kits (see first table, below), at least 1 emergency medical kit (see second table, below), and universal precautions equipment on all aircraft. Requirements for airlines not serving the U.S. vary, but most major carriers do provide AEDs for emergency use and emergency medical kits, especially on international routes. The most common in-flight emergencies are cardiac and gastrointestinal problems.

### **TABLE 1: FIRST AID KITS**

Aircraft registered in the U.S. must carry 1-4 onboard first aid kits, depending on the number of passenger seats. In general, each first-aid kit must contain the following items:

- Antiseptic swabs (10/pack)
- Bandage: adhesive strips
- Bandage: gauze 7.5 cm x 4.5 m
- Bandage: triangular; safety pins
- Dressing: burn 10 cm x 10 cm
- Dressing: compress, sterile 7.5 cm x 12 cm
- Dressing: gauze, sterile 10.4 cm x 10.4 cm
- Tape: adhesive 2.5 cm (roll)
- Steri-strips (or equivalent adhesive strip)
- Hand cleanser or cleansing towelettes
- Pad with shield, or tape, for eye
- Scissors: 10 cm (if allowed by national regulations)
- Tape: Adhesive, surgical 1.2 cm x 4.6 m
- Tweezers: splinter
- Disposable gloves (multiple pairs)

- Thermometers (non-mercury)
- Mouth-to-mouth resuscitation mask with one-way valve
- First-aid manual, current edition
- Incident record form

The following suggested medications can be included in the first-aid kits if permitted by national regulations:

- Mild to moderate analgesic
- Antiemetic
- Nasal decongestant
- Antacid
- Antihistamine

## TABLE 2: EMERGENCY MEDICAL KIT

- Stethoscope
- Sphygmomanometer (electronic preferred)
- Airways, oropharyngeal (3 sizes)
- Syringes (appropriate range of sizes)
- Needles (appropriate range of sizes)
- Intravenous catheters (appropriate range of sizes)
- Antiseptic wipes
- Gloves (disposable)
- Needle disposal box
- Urinary catheter
- System for delivering intravenous fluids
- Venous tourniquet
- Sponge gauze
- Tape – adhesive
- Surgical mask
- Emergency tracheal catheter (or large gauge intravenous cannula)
- Umbilical cord clamp
- Thermometers (non-mercury)
- Basic life support cards
- Bag-valve mask
- Flashlight and batteries
- Epinephrine 1:1000
  - If a cardiac monitor is available (with or without an AED) add to the above list: Epinephrine 1:10,000 (can be a dilution of epinephrine 1:1,000)
- Antihistamine – injectable
- Dextrose 50% (or equivalent) – injectable: 50 mL
- Nitroglycerin tablets or spray
- Major analgesic
- Sedative anticonvulsant – injectable
- Antiemetic – injectable
- Bronchial dilator – inhaler
- Atropine – injectable
- Adrenocortical steroid – injectable
- Diuretic – injectable
- Medication for postpartum bleeding
- Sodium chloride 0.9% (minimum 250 mL)
- Acetyl salicylic acid (aspirin) for oral use
- Oral beta blocker

Travax content represents decision-relevant, expert synthesis of real-time data reconciled with new and existing available advice from authoritative national and international bodies. Recommendations may differ from those of individual countries' public health authorities.

© Shoreland, Inc. All rights reserved.