Travel Medicine

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Objectives

• Define travel medicine and its importance
• Levels of travel medicine (pre, during, post)
• Pre-travel consultation (risk assessment, risk management, immunization, prophylaxis, self-medications)
• Immunization (required, recommended, routine)
• Other infections (malaria, zika, traveler’s diarrhea)
• Prevention (food, water and personal precautions, environmental precautions, vector and animal precautions, injury precautions)
• Travel emergency kit
• Post-travel care
What is travel medicine?

An interdisciplinary specialty concerned with prevention, early detection, and research of health problems associated with travel.
What does travel medicine do?

• Seeks to prevent illnesses and injuries occurring to travelers going abroad
• Manages problems arising in travelers coming back or coming from abroad
• Impact of tourism on health and to improve health and safety services to tourists
• Refugee and migrant health
Why travel medicine?

WORLDWIDE

• 1950 - 25 million international tourist arrivals
• 2000 - 664 million international tourist arrivals
• 2010 - 940 million international tourist arrivals (growth rate 7% from 2009)
• 2030 – forecast 1.8 billion

World Tourism Organisation
International Travel
Importance of travel medicine

Of 100,000 travellers to the developing world for 1 month

• 50,000 will develop some sort of health problem during their trip
• 8000 will see a physician
• 5000 will have to stay in bed
• 300 will have to be admitted to hospital either during their trip or on return
• 50 will need to be air evacuated
• 1 will die

Concerns

• International travel carries a risk for travelers, community of origin and community of destination

• The risk for travelers includes diseases, injuries and death
Types of travelers

- Tourists
- VFRs (visiting friends and relations)
- Business travellers
- Migrant workers
- Military
- Aid and Development workers
- Expatriates
- Students
- Gap Year travel
- Asylum seekers
- Refugees
- Pilgrims
Special populations

• Elderly travellers
• Infants and children
• Pregnant women
• Travellers with chronic diseases
• Travellers with disability
• Immunocompromised traveller
Special itineraries

- Cruise ship travel
- Diving
- Extended stay

- Extreme travel
- Mass gatherings (eg. The Hajj)
- Wilderness/remote regions travel

Risk depends on destination
Components of travel medicine

• Pre-travel
• During travel
• Post-travel
Pre-travel consultation
(4-6 weeks before departure)

- Risk assessment (potential hazards)
- Risk management (advice to reduce exposure to health risks)
- Service delivery: immunization, prophylaxis or self-medications
- Empower traveler to manage his health
Risk assessment

Information about travelers
- Age and sex
- Medical history
- Medications
- Allergies
- Immunization history
- Special health needs

Information about trip
- Destination
- Length of stay
- Mode of transport
- Purpose of trip and planned activities
- Financial budget, accommodation, insurance
- Healthcare in destination
Risk factors and health problems facing international travelers

**RISK**
- Overcrowding
- Low sanitation
- Climatic change
- Vector of diseases
- Stray animals
- Unsafe roads
- Security problems

**HEALTH PROBLEMS**
- Aggravation of existing problem
- Food and water borne infections
- Air borne infections
- Unintentional & Intentional Injuries
- Vector borne diseases
- Zoonotic diseases
Common diseases associated with international travel

- **Gastrointestinal**
  - Traveler's diarrhea
  - Typhoid fever
  - Hepatitis A
  - Cholera
  - Poliomyelitis

- **Respiratory diseases**
  - Influenza
  - Meningitis
  - Mers-Cov
  - Tuberculosis

- **Vector borne diseases**
  - Yellow fever
  - Malaria
  - Dengue fever
  - Leishmaniosis
  - Japanese encephalitis

- **Behavior related**
  - Sexually transmitted diseases

- **Zoonotic diseases**
  - Rabies

- **Blood borne**
  - Hepatitis B

- **Soil borne**
  - Tetanus
Unintentional and intentional injuries

- Road traffic injuries
- Inter-personal violence
- Injury in recreational water
- Animal bites (domestic and wild animals)
Risk management (give advise)

- Food and water safety and hand hygiene
- Insect bite prevention
- Immunization
- Malaria prevention
Risk management (give advise)

- Personal safety (RTA, fall, drowning, fire, robbery, STD)
- Environmental risks (sun exposure, heat, high altitude, motion sickness, DVT)
- Travelers with special needs (chronic disease, children, pregnant)
- Traveler’s medical insurance
Preventive measures for common diseases among international travelers

Immunization or Chemoprophylaxis

and

General measures for the prevention of infectious diseases
Immunization

• Routine
  • Childhood immunizations

• Recommended
  • According to risk of infection

• Required
  • Yellow fever vaccine
  • Meningococcal vaccine
Immunization for travelers

Weeks before travel

6  5  4  3  2  1  0

1st consultation

2nd consultation

4-6 weeks before travel
Booster doses
# Routine immunizations

<table>
<thead>
<tr>
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<th>Others in other countries</th>
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<tbody>
<tr>
<td>Hepatitis A</td>
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<td>Varicella</td>
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<td>Hemophilus influenza</td>
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Required immunizations

- Yellow fever (international health regulation)
- Meningococcal meningitis: by Saudi Arabia for Hajj and Umrah and seasonal workers.
- Polio
Yellow fever vaccine

**Required** for travelers to a country under the *International health regulations*.

**Recommended**: for travelers to *endemic* area.
Yellow fever vaccine recommendations
Yellow fever vaccine

- Live attenuated virus vaccine
- Single subcutaneous injection
- Immunity starts after 10 days
- Valid for 10 years

Not recommended for
- Infants < 9 months
- Immune compromised patients
- Pregnant women
- Egg allergies
- HIV-positive individuals
Meningococcal meningitis

• **Required**: by Saudi government for Hajj or Umrah.
• **Recommended**: for travelers to **endemic** area.

Risk:

• Sub-Saharan Africa (seasonal)
• Saudi Arabia (Hajj)
• Crowded student dormitory situations
Meningitis belt
Meningococcal vaccine

• Quadrivalent polysaccharide (MPSV4; A, C, Y, W-135) or conjugated with diphtheria
• Single dose (injection)

Protection
• Protection is for 3–5 years in adults and older children
• Not effective for children below 2 years
Recommended immunizations (according to risk)

- Hepatitis A, B
- Typhoid
- Cholera
- Poliomyelitis
- Meningococcal meningitis
- Japanese encephalitis
- Rabies
- Tick-borne encephalitis
Hepatitis A

- Endemic in many developing countries
- High mortality in elderly and pregnant women.
- Prevention by food, water, personal hygiene and immunization
Hepatitis A vaccine

- Two doses of **inactivated** vaccines (HAVRIX® or VAQTA®)
- First dose: 70 – 85% develop antibodies within two weeks
- Second dose: after 12 to 18 months leading 100% sero-conversion
- If traveling in <4 weeks after 1st dose: immune globulin should be administered at a different anatomic injection site

**Protection**
- 14 – 20 years in children
- 25 years among adults

**Recommended**
- Travelers to the developing countries
- 2 years and older
Hepatitis B

Transmission: Blood-borne, sexual contact

Prevention: Avoid risk factors, immunization
Hepatitis B vaccine

- **Recombinant** vaccine given by intramuscular injection
- Monovalent or combined with hepatitis A (for those ≥ 18 years)
- Regular schedule: 0-, 1-, and 6-month with no booster dose
  - Accelerated schedule for the combined vaccine only (FDA)
    - 0-, 7-, and 21- days
    - Booster dose at 1 year

⚠️ Recommended for travelers to endemic areas and travelers with special risk
Typhoid

• Transmission: by contaminated food and water
• Prevention: food, water, personal hygiene and vaccination
Typhoid vaccine

Live attenuated (Ty21a)
- **Oral** vaccine
- **Four** doses (One capsule on alternating days not with antibiotics)
- Schedule should be completed at **least one week** before traveling
- **Booster** every 5 – 7 years

- Vi capsular polysaccharide vaccine (ViCPS)
  - **Single** dose **intramuscular** injection
  - At **least two weeks** before traveling
  - **Booster** at 2 years intervals

- Both vaccines are effective but differ in duration of immunity
- Compliance may be a problem with oral vaccine

- Recommended to travelers to developing countries
Cholera

- Transmission by contaminated food or water
- Rare in travelers
- Prevention:
  - food, water and Personal hygiene
  - Vaccination (oral)
Cholera vaccine

• **Live** attenuated **oral** vaccine

• Result in 60–80% protection for 6 to 12 months

• Not effective against the new serotype O139 (spread rapidly through Asia in mid 90s)
Polio

- Transmission: contaminated food and water.
- Rare in travelers
- Prevention:
  - Food, water, personal hygiene
  - Vaccination (injectable, oral)
Polio in Saudi Arabia

• In Saudi Arabia, proof of receipt of polio vaccine is **required** from travelers from endemic countries or countries vulnerable to infection or re-infection.

• (within the previous 12 months and at least 4 weeks prior to departure)

• All travelers from these countries will also receive 1 dose of OPV at border points on arrival in Saudi Arabia
Japanese encephalitis

- Transmission: by mosquito bite
- Risk increases in travelers to rural Asia or long stay travelers.
- Prevention: vector control and vaccination
Japanese encephalitis vaccine

• Two available vaccines
• Given as three doses: 0, 7 and 30 days
  • Accelerated schedule of two doses at 0 and 7 days (80% conversion)
• The last dose should be at least 10 days before departure
• Booster dose at 24 months if the risk continues

❖ Vaccine should be given at least 10 days prior to departure because of the possible serious adverse reactions
Rabies

- Transmission: animal bite or scratch
- Risk: occupational, travel to rabies risk countries
- Prevention; immunization
  - Preexposure
  - Post exposure
  - Immunoglobulin
Rabies vaccine

• Inactivated vaccine
• Three doses on 0, 7, and 21 or 28 (intramuscular)

Note:
• Pre-exposure vaccine eliminates the need for rabies immune globulin (RIG) after exposure, but does not eliminate the need for additional post exposure rabies vaccinations.
Tick-borne encephalitis

- Transmission by:
  - Ixodes sp. Ticks
  - Ingestion of unpasteurized dairy products
- Rural forested areas of east and central Europe, Russia and parts of Asia
- March – November
Tick-borne encephalitis

Prevention:
• Tick prevention
• Avoidance of unpasteurized dairy products
• Vaccination
• Self check and removal ASAP (tweezers)
Other vaccines – influenza

The risk
- Risk of exposure to the virus is **throughout the year in tropical and subtropical areas**
- The attack rate is 1.2–2.8% in travelers of **all age groups**

The vaccine
- Inactivated parenteral vaccine
- Live attenuated vaccine administered by nasal spray (for healthy persons 5–49 years)

Recommended to travelers to
- tropics and subtropics at risk of serious related complications
- Southern Hemisphere from **April through September**
Other vaccines - Tuberculosis

The vaccine

- BCG vaccine
- Live attenuated
- Single intradermal injection

- Recommended to long stay in developing countries
- Baseline tuberculin before travel with a follow up every 1 year
Chemoprophylaxis
Malaria

• Transmission by mosquito bite

• Prevention:
  • Awareness
  • Bite avoidance
  • Chemoprophylaxis
  • Diagnosis of febrile illness

• Fever in returned traveler is a medical emergency considered malaria until proven otherwise
Malaria chemoprophylaxis

• Proguanil (all areas)
  1 – 2 days before departure, daily during the journey and 7 days after return

• Doxycycline (all areas)
  1 – 2 days before departure, daily during the journey and 4 weeks
Malaria chemoprophylaxis

• Chloroquine (chloroquine sensitive areas)
  1 – 2 weeks before departure, daily during the journey and 4 weeks after return

• Primaquine (predominant vivax areas and ovale)
  1 – 2 days before departure, daily during the journey and 7 days after return

• Mefloquine (mefloquine sensitive areas)
  2 weeks before departure, daily during the journey and 4 weeks after return
Other infections
Zika virus

- Transmission by mosquito bite
- Risk to pregnant women → microcephaly and other brain abnormalities
- Prevention: preventing mosquito bites
Traveler’s diarrhea

Cause:

- Bacterial (60-80%)
- Viral (10-20%)
- Parasitic (5-10%)
Traveler’s diarrhea

Prevention:

• Wash It, Peel It, Cook It, or Forget It
• Only Drink Bottled Water
• Wash hands frequently
Post-Travel Care

• Post-travel checkup
  • Long term travelers
  • Adventure travelers
  • Expatriates in developing world

• Post-travel care
  • Fever, chills, sweats
  • Persistent diarrhea
  • Weight loss
Travelers’ responsibilities
Responsibilities of traveler

- Decide on the travel destination and timing
- Recognize and accept risk
- Visit the general practitioner prior to traveling
- Obtain travel insurance
- Adhere to the preventive precautions
- Carry medical kits and understand its use
- Assume the responsibility of the health and safety of children
- Respect people and culture in country of destination
- Visit the general practitioner upon return
Responsibility of traveler: check status of destination

Warning level 1: Practice usual precautions

Presence of usual risk for infectious diseases as diarrheal diseases and malaria

Warning level 2: Practice enhanced precautions

Presence of MERS-CoV is Arabian Peninsula

Warning level 3: Avoid non-essential travel

Presence of outbreak (Ebola) and adverse security situation
Responsibility of traveler: consult general practitioner

Before departure

Timing: **4 to 6 weeks**

Purpose
- Medical evaluation
- Risk assessment
- Receive preventive interventions
- Travel advice

After arrival

- Have chronic diseases
- Spent >3 months in a developing country
- Received treatment for malaria while travelling
- Exposed to a serious infectious disease while travelling
- Experienced illness in the weeks following return (fever, persistent diarrhea, vomiting, jaundice, urinary disorders, skin disease or genital infection)
Responsibility of traveler: carry emergency medical kits

• Usual prescription medications in sufficient quantities

• Essential over the counter medicines to meet common illnesses
  • Analgesics
  • Decongestant, cold medicine, cough suppressant
  • Antibiotic/antifungal/hydrocortisone creams antacid

• First aid kits
  • Band-Aids, gauze bandages, tape, Ace wraps
  • Tweezers, scissors, thermometer

• Special items according to destination
  • Insect repellent, sunscreen, lip balm
Responsibility of traveler: issue travel insurance

• Required in case of
  • Illness
  • Accident
  • Death

• Covers
  • Changes to the itinerary
  • Emergency repatriation for health reasons
  • Medical care (illness and accidents)
  • Hospitalization
  • Repatriation of the body in case of death.
Precautions
Food and Water Precautions

• Bottled water
• Selection of foods
  • well-cooked and hot
• Avoidance of
  • salads, raw vegetables
  • unpasteurized dairy products
  • street vendors
  • ice
Environmental Precautions

• Air Travel
• Jet Lag
• Sun Protection
• Extreme Heat and Cold
  • dehydration, heat stroke
  • hypothermia, frostbite
• Altitude
• Water recreation
  • Drowning, boating & diving accidents
  • Risk of schistosomiasis or leptospirosis
  • Biological and chemical contamination
Vector Precautions

• Covering exposed skin
• Insect repellent containing DEET 25 – 50%
• Treatment of outer clothing with permethrin
• Use of permethrin-impregnated bed net
• Use of insect screens over open windows
• Air conditioned rooms
• Use of aerosol insecticide indoors
• Use of pyrethroid coils outdoors
• Inspection for ticks
Animal Precautions

• Animal avoidance
• Rabies
  • Specific animal threats
  • Medical evaluation of bites/scratches
  • Post exposure immunization and immunoglobulin
• Envenomations
  • Snakes, scorpions, spiders
  • Maritime animals
Injury and Crime

• Vehicles
  • Risk of road and pedestrian accidents
  • Night travel
  • Seat belts and car seats

• Avoid the use of drugs and alcohol

• Understanding local crime risks
  • Scam awareness
  • Situational awareness
  • Location avoidance
Travel Health Resources

• CDC Travelers’ Health Website
  • www.cdc.gov/travel

• World Health Organization
  • www.who.int/int

• State Department
  • travel.state.gov

• International Society of Travel Medicine
  • www.istm.org

• Health Information for International Travel
  • CDC “Yellow Book”

• International Travel and Health
  • WHO “Green Book”
References


• TravellersDiarrhoea.co.uk


Exercise
<table>
<thead>
<tr>
<th>HEAT-STROKE</th>
<th>POLIO</th>
<th>MALARIA</th>
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<td>RABIES</td>
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<td>HEPATITIS-B</td>
<td>MANINGITIS</td>
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**HORIZONTAL:**
1- Vector borne infection
2- Important in your travel tool kit
3- Oral and injectable vaccines
4- Environmental risk for travelers
5- Special risk to pregnant women
6- Required vaccine

**VERTICAL:**
1- Special importance in hajj
4- Blood borne infection
7- Main way to prevent it is water food and personal hygiene
8- Animal borne infection
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<thead>
<tr>
<th>Analgesics</th>
<th>Malaria</th>
<th>Encephalitis</th>
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<tbody>
<tr>
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<td>Zika</td>
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