Vaccination

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Immunisation: specific antigens are injected, in order to induce antibody producing. Or artificially produced antibodies are injected for same reason.

KILLED VACCINES – the inactivated vaccine (or killed vaccine) consists of virus particles which are grown in culture and then killed using a method such as heat or formaldehyde. The virus capsid proteins are intact enough to be recognized by the immune system and evoke a response. (polio, influenza, cholera, typhoid, YF, etc.)

TOXOID – toxin was fully inactivated but still has a good residual antigenicity. When it used during vaccination, an immune response is mounted and immunological memory is formed against the molecular markers of the toxoid without resulting in toxin-induced illness. (diphtheria, tetanus, botulism)

LIVE VACCINES

Active, but attenuated (reducing the virulence of a pathogen, but still keeping it viable or "live") microbe (virus or bacteria), meant to proliferate in the person and producing immunisation. (BCG, typhus)

SUBUNIT VACCINES

The immunising agent is a purified component (or a mixture of a few components) of the pathogen microbe.

Vaccine preventable infectious diseases

- Influenza
- Japanese encephalitis
- Thick borne encephalitis
- Meningococcal meningitis
- Morbilli
- Pestis
- Typhus (Rickettsia origin)
- Typhoid fever (Salmonella origin, typhus abdominalis)
The 3R rule of travel immunisation

- **Routine**: childhood and adult, if they are not obligatory in the homeland of traveler
- **Recommended**: according to risk of local infections on the endemic areas
- **Required**: if the traveler enters or arrives from some dedicated countries (yellow fever and meningococcal meningitis)

“Routine” Vaccinations

- Tetanus, diptheria (pertussis)
- Measles, mumps, rubella (MMR)
- Haemophilus influenza b
- Hepatitis B
- Poliomyelitis (IPV)
- Pneumococcal disease
- Tuberculosis (BCG)

“Required” Vaccinations – the traveller should not enter in or leaves of the endemic country without them

- Yellow fever (Stamaril)
- Meningococcal disease (Menveo/Mencevax)

The following are regarded as countries and areas with risk of YFV transmission:


**Americas**: Bolivia, Brazil, Colombia, Ecuador, French Guiana, Guyana, Panama, Peru, Suriname, Trinidad and Tobago, and Venezuela.

Countries and areas with risk of YFV transmission

Meningitis vaccination is mandatory for pilgrims of hajj or umrah from 1984
"Recommended" vaccinations

- Yellow fever (Stamaril)
- Meningococcal disease (Menveo/Mencevax)
- Hepatitis A (Havrix)
- Typhoid fever (Typhen Vi)
- Japanese encephalitis (Ixiaro)
- Tickborne encephalitis (FSME-Immun/Encepur)
- Cholera (Dukoral)
- Rabies (Rabipur)

The vaccination must be performed in due time
Time interval between vaccination and travel

<table>
<thead>
<tr>
<th>Illness</th>
<th>28 days (1 month)</th>
<th>14 days (2 weeks)</th>
<th>10 days</th>
<th>7 days (1 week)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow fever</td>
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<td></td>
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<tr>
<td>Typhus</td>
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<td></td>
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<tr>
<td>Typhus (oral)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diphtheria/tetanus</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Hepatitis A</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Hepatitis A+B</td>
<td></td>
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<tr>
<td>Rabies</td>
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<tr>
<td>Polo</td>
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</tr>
<tr>
<td>Meningitis</td>
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</tr>
<tr>
<td>Cholera</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Gamma globulin</td>
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</tbody>
</table>

BASIC CONSIDERATIONS – TELL YOUR PATIENT during PRE-TRAVEL CONSULTATION

1. Not either the vaccination provide 100% immunisation
2. Besides the vaccination one needs other prevention measurements as well (eg. malaria chemoprofilaxis + antirepellent + physical protection)
3. The vaccination must be performed in due time
4. The doctor must provide a tailor-made immunisation and pre-travel advice, takes into consideration all the risks of travel and traveler

CONTRAINDICATIONS OF VACCINATION

1. Live vaccines should not apply during pregnancy!
2. Feverish state or illness with fever
3. Previous medical history of protein-allergy or medical history of allergic/anaphylactic reaction after vaccination
4. History of Guillain – Barre syndrome
5. Exposure to infectious disease
6. Breastfeeding
7. Bleeding disorders
8. Encephalopathy
9. In most form of immunodeficiency
10. Some vaccine application in pregnancy

General recommendations

- Minor illnesses (diarrhea, mild upper respiratory infection, low-grade fever) are not contraindication to vaccination
- Site of injection: deltoid muscle (thigh in babies)
- Tuberculosis innoculations always on left side
- Advise for minor local reactions and use of ice and paracetamol
- Always register vaccinations and report adverse events
Vaccination of children

<table>
<thead>
<tr>
<th>Illness</th>
<th>Indicated</th>
<th>Notice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow fever</td>
<td>yes</td>
<td>&gt; 6 months</td>
</tr>
<tr>
<td>Typhus (oral)</td>
<td>yes</td>
<td>&gt; 6 year</td>
</tr>
<tr>
<td>Typhus (oral)</td>
<td>yes</td>
<td>&gt; 2 year</td>
</tr>
<tr>
<td>Hepatitis A</td>
<td>yes</td>
<td>&gt; 1 year</td>
</tr>
<tr>
<td>Hepatitis A+B</td>
<td>yes</td>
<td>&gt; 12 year</td>
</tr>
<tr>
<td>Polio</td>
<td>yes</td>
<td>&gt; 6 year</td>
</tr>
<tr>
<td>Typhus (im.)</td>
<td>no</td>
<td></td>
</tr>
<tr>
<td>Typhus (oral)</td>
<td>no</td>
<td></td>
</tr>
<tr>
<td>Malaria</td>
<td>no</td>
<td></td>
</tr>
<tr>
<td>Rhabies</td>
<td>yes</td>
<td>no age limit, important for children</td>
</tr>
<tr>
<td>Vaccination of pregnant women</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yellow fever</td>
<td>May be used if benefit outweighs risk, but generally no</td>
<td></td>
</tr>
<tr>
<td>Typhus (oral)</td>
<td>no</td>
<td></td>
</tr>
<tr>
<td>Polio</td>
<td>yes</td>
<td>&gt; 6 year</td>
</tr>
<tr>
<td>Hepatitis A</td>
<td>yes</td>
<td></td>
</tr>
<tr>
<td>Hepatitis A+B</td>
<td>yes</td>
<td></td>
</tr>
<tr>
<td>Malaria</td>
<td>no</td>
<td></td>
</tr>
<tr>
<td>Rhabies</td>
<td>yes</td>
<td></td>
</tr>
<tr>
<td>Polio</td>
<td>yes, but only if it is inevitable</td>
<td></td>
</tr>
<tr>
<td>Malaria</td>
<td>no</td>
<td></td>
</tr>
</tbody>
</table>

Vaccination of elderly people

As we get older, our immune systems tend to weaken over time, putting us at higher risk for certain diseases. When older adults get these diseases, they can have more severe illnesses than younger people. Vaccines can help boost the immune system to lessen the risk of older adults getting vaccine-preventable diseases.

Vaccination of immunocompromised patient

Case-by-case pretravel consultation

1. Immunocompromised people should not receive live vaccines because of the risk of disease caused by the vaccine strain. Where immunosuppression is mild and data are available to support their use, OR: The risk of natural infection is greater than the risk of immunization. Therefore, they should receive pneumococcal vaccine as well as annual immunization with trivalent inactivated influenza vaccine. Hib vaccine may be recommended in some circumstances, such as following organ transplants.

COMPLICATIONS – related to vaccination

1. common problems
   - fever – dangerous is the hyperpexia > 40 °C
   - antralgia – could last more than 10 days
   - collapsus – recovery position, monitoring of vital signs and blood pressure
   - bacterial superinfection – on the site of vaccination
   - pain – on the site of vaccination, with/without flushing

2. average problems
   - anaphylactic reaction – occurs in 1 hour or shorter, monitoring, open airways [glottis edema], antiallergic drugs, CPR, hospitalisation – prompt reaction: anaphylactic shock
   - allergic reaction – within 24 hours, erythema (hives), erythoderma, itchiness, edema on neck, dyspnoe
   - abscess in the site of vaccination – incision, surgical intervention
COMPLICATIONS –
related to vaccination

3. life-threatening situations

- acute, flaccid paralysis [Guillain-Barre syndrome] – acute starting, the paralysis goes upward, symmetrical and without fever
- encephalopathy, encephalitis
- meningitis – Kernig/Brudzinsky sign
- convulsions – with or without fever
- anaphylactic shock – circulatory collapse, bronchospasam, laryngospasam, glottisedema, asphyxia