

# Arbovirus infection 1

## Clinical Tropical Medicine

### FACTM (Clinical) Pt 1

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# Arbovirus infection series

Arbo 1 Clinical Tropical Medicine

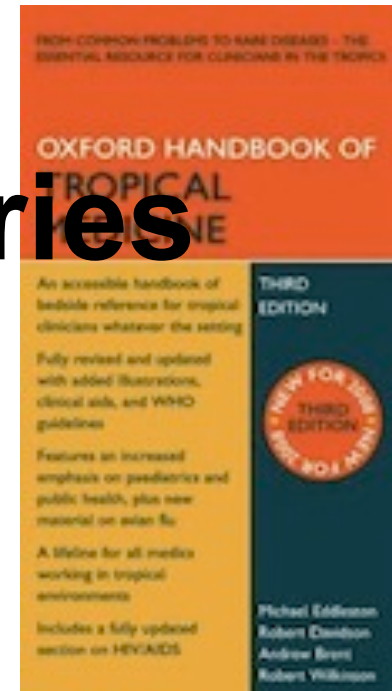
Arbo 2 Clinical Entomology

## Reading

Oxford Handbook of Tropical Medicine. 3<sup>rd</sup> edn. Eddleston et al.  
OUP, 2008. pp724-731

Public Health Medicine for the Tropics. 4<sup>th</sup> edn. Adetokunbo &  
Gilles. Arnold. pp175-234

Manson's Tropical Diseases. Cook GC et al. 22<sup>nd</sup> edn. ISBN  
978-1-4160-4470-3 Chs 40, 41. pp 715-761.



# Clinical features

- Assortment of clinical syndromes
- Classical presentations:
  - **Undifferentiated febrile illness** ± rash
  - **Polyarthriti**s ± rash
  - **Haemorrhagic fever**, progressing to shock
  - **Encephaliti**s
- **Exceptions**: variable clinical features, overlap between syndromes
- **Setting**: history of arthropod bite exposure, and travel within & outside Australia



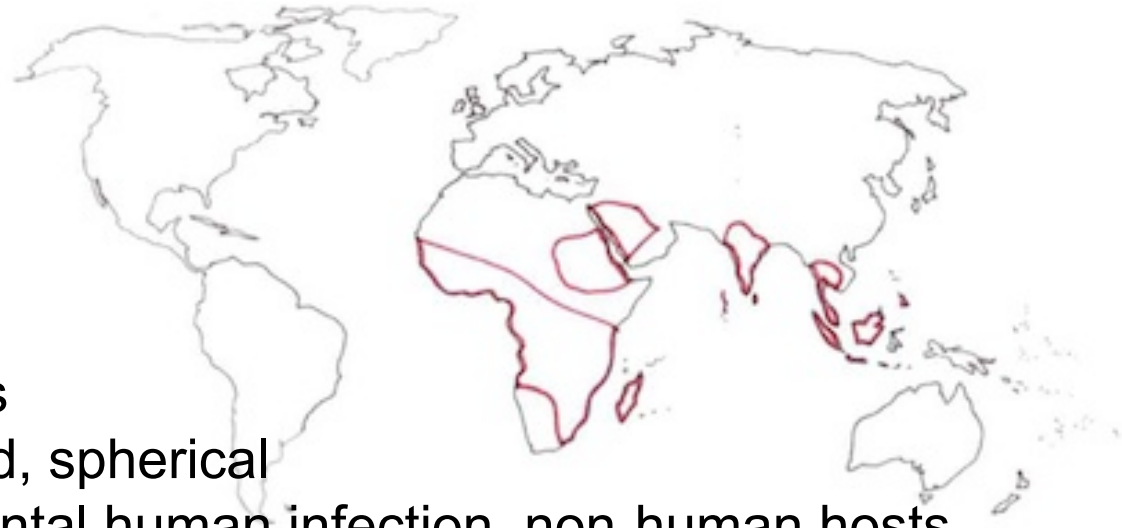
# Epidemiology



- **Where:** in Australasia, SE Asia, Indian Ocean Rim, Western Pacific, SS Africa, Central & SAm
  - endemic for several important arbovirus infections including Dengue, Japanese encephalitis, Yellow Fever, Ross River virus infection and Murray Valley Encephalitis
  - epidemics of dengue (incl DHF, DSS), Chikungunya, JE, Rift Valley Fever
- **Who:**
  - Endemic areas; extremes of age, long lasting strain-specific immunity
  - Travel-related; adults from non-endemic locations
- **When:**
  - Seasonal
  - Development activities
  - Activity-related; urban/sylvatic differences



# Virology



- ★ 500 distinct arboviruses
- ★ RNA viruses, enveloped, spherical
- ★ Mainly zoonotic, accidental human infection, non-human hosts
- ★ Closely related groups have cross-reactive antigens
- ★ 3 main groups
  1. **alphaviruses**: POS sense. Ross River virus, Chikungunya virus; arthralgia
  2. **flaviviruses**: POS sense. Yellow Fever, Dengue (1-4), Japanese encephalitis, Murray Valley encephalitis viruses; most important human infections
  3. **bunyaviruses**: NEG sense. Rift Valley Fever virus



# CMx: assess

- **Key questions:**
  - Could the patient have an arbovirus infection?
    - Has the patient been exposed to biting insects or ticks?
    - Has the patient travelled within or outside Australia?
  - Does the patient have malaria?
- **Examination**
  - Fever
  - Rash
  - Bleeding tendency, tourniquet test
  - Plasma leakage & shock
  - Acute neurological signs
  - Arthropathy



# CMx: investigate

- **Key issues:**
  - Does the patient have malaria?
  - FBC, films, HRP2, BC, baseline U&E, LFTs
  - Start arbovirus investigations but don't wait for results
- **Rapid virus detection:** RT-PCR, early in acute disease
- **Arbovirus serology:**
  - IgM earlier positive but long lived. May cross react with related viruses
  - IgG takes time to appear, may cross react with related virus antibodies
  - Rising titre over 2-4wk from disease onset
  - Confirmation by neutralisation test
  - Best interpretation by expert with knowledge of arbovirus infection prevalent at place of likely exposure



# CMx: decide

- Use all information available (history, exam, investigations) to refine differential diagnosis
- If evidence of other infection is it possible that arbovirus infection at same time?
- Dengue
  - Classical features may be strongly suggestive of diagnosis
  - If known history of past dengue, beware of higher risk of DHF / DSS
  - If established DHF, watch for peak risk of conversion to DSS
- What kind of follow-up

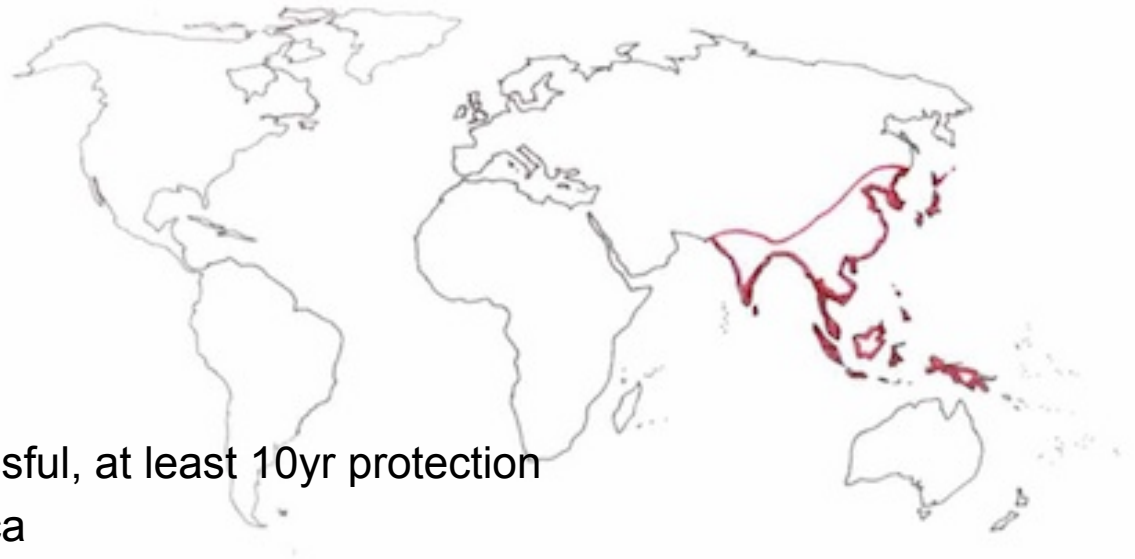


# CMx: act

- **Other infections need immediate Rx:**
  - Malaria, typhoid, leptospirosis, encephalitis?
- **DHF:** does patient need transfusion, fresh blood, other blood products?
- **DSS:** does patient need fluid replacement, colloids & for how long?



# Vaccines



## **Yellow fever:**

- YFV 17D, highly successful, at least 10yr protection
- SS Africa, South America

## **Japanese encephalitis:**

- Formalin killed, multiple dose, booster requirement
- High risk overseas travel

## **Rift Valley Fever:**

- selective use

## **Dengue:**

- quadrivalent
- several candidates awaited



# Emerging issues

- **Vaccines:** DENV
- **Arthropathy:** mechanism of RRV synovial damage
- **Recent outbreaks:** DENV, CHIKV, JE
- **Laboratory diagnostic support**
- **Pre-travel advice:** for adventure travellers, aid workers

