

Arthropod overview

Arthropods Overview

General Characteristics

Arthropods are **ancient, highly diverse organisms** with the following features:

- **Segmented bodies**
- **Paired, jointed appendages** (*legs and antennae*)
- **Exoskeleton**
- **Bilateral symmetry**

Life Cycle

- Growth occurs via **molting** through stages:
 - Egg
 - Larva or nymph
 - Adult
 - Represent the **most diverse phylum**, with most species in:
 - **Class Insecta**
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Classification

1. Mandibulates (with antennae)

- Insects
- Chilopoda (*centipedes*)
- Diplopoda (*millipedes*)

2. Chelicerates (without antennae)

- Scorpions
- Spiders
- Mites







Pathophysiology

1. Mechanical Trauma

- Occurs due to:
 - **Puncture or laceration** during skin penetration
- Depends on **mouthparts**

Blood-feeding Types

- **Vessel feeders:**
 - Mosquitoes
 - Lice
 - ? Direct capillary feeding
- **Pool feeders:**
 - Stable flies
 - ? Tear skin and feed on pooled blood

2. Injection of Substances

- Injected during feeding or stinging:
 - Irritants

- Cytotoxic agents
 - Pharmacologically active substances (*histamine, enzymes*)
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3. Injection of Allergens

- Host immune response to:
 - Salivary proteins
 - Venom antigens
 - Leads to:
 - **Papular hypersensitivity**
 - **Systemic allergic reactions**
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4. Secondary Infection

- Due to:
 - Scratching
 - Direct inoculation of bacteria
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5. Tissue Invasion

- Certain arthropods (e.g., flies) cause:

- **Myiasis** (*larval invasion of tissues*)
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6. Contact Reactions

- Caused by:
 - Secretions
 - Body fragments
 - May be:
 - Irritant
 - Allergic
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7. Reactions to Retained Mouthparts

- Example:
 - Tick bites
 - Can lead to:
 - **Granulomatous inflammation**
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8. Transmission of Diseases

- Arthropods act as **vectors** for major diseases:

- Mosquitoes ? Malaria
 - Lice ? Typhus
 - Sandflies ? Leishmaniasis
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9. Environmental and Social Factors

- Exposure influenced by:
 - Habitat
 - Clothing
 - Occupation
 - Animal contact
- Increased risk with:
 - **Overcrowding**
 - **Poor housing conditions**

Clinical Features

- Spectrum ranges from:
 - **Asymptomatic bites**
 - **Pruritic papules**
 - **Urticarial wheals**

- Severe reactions:
 - Bullous lesions
 - Localized necrosis
 - Systemic hypersensitivity



<https://casereports.bmj.com/content/bmjcr/11/1/e228079/F1.large.jpg>



A



B



D



E



Investigations

- Based on **identification of arthropod source**

Methods

- Examination of:
 - Skin lesions
 - Environment
- Collection of specimens from:
 - Animals
 - Bedding
 - Household surroundings

Management

1. Prevention

- **Insect repellents:**
 - DEET
 - Citronella

- **Protective measures:**

- Protective clothing
 - Insecticide-treated nets
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2. Treatment

- **Local care:**

- Wound cleaning
- Removal of retained parts

- **Medications:**

- Topical corticosteroids
- Antihistamines
- Systemic therapy (if severe)

- **Antibiotics:**

- For secondary infection

- **Specific therapy:**

- **Antivenom** (if envenomation)
 - **Tetanus prophylaxis** when indicated
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3. Supportive Measures

- **Pain relief:**
 - Ice packs
 - Analgesics
- **Allergy management:**
 - Desensitization therapy (*in selected cases*)

Key Takeaways

- ? Arthropods are **diverse organisms** with medical importance
- ? Cause disease via **bites, stings, allergens, and infection transmission**
- ? Reactions range from **mild papules to severe systemic responses**
- ? Prevention (repellents, nets) is **crucial**
- ? Treatment includes **symptomatic care, antibiotics, and antivenom when needed**

Arthropod-Related Skin Disorders – Clinical Features, Investigations, and Management

Clinical Features

Local Reactions

- **At the bite/sting site:**

- Redness
- Swelling
- Pain

- **Skin lesions:**

- Papules
- Wheals
- Vesicles
- Bullae

- **Varies depending on:**

- Type of arthropod
- Host immune response



<https://casereports.bmj.com/content/bmjcr/11/1/e228079/F1.large.jpg>

<https://casereports.bmj.com/content/bmjcr/12/11/e232791/F1.large.jpg>

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Systemic Reactions

- **Allergic manifestations:**

- Urticaria
- Angioedema
- Anaphylaxis (*severe cases*)

- **Vector-borne disease features:**

- Fever
- Rash
- Organ-specific symptoms

Chronic Manifestations

- Persistent:
 - Pruritus
 - Granulomas
 - Ulcers
 - Necrotic lesions
- **Secondary bacterial infection:**
 - Cellulitis
 - Abscess formation

Special Features (Arthropod-Specific)

Ticks

- Local pruritus
- Retained mouthparts
- **Erythema migrans** (*Lyme disease*)

Mites

- Burrows

- **Intense itching** (*scabies*)

Flies

- **Myiasis:**
 - Larval invasion of tissues





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Investigations

1. History and Clinical Examination

- Identify:
 - Arthropod exposure
 - Environmental risk factors
 - Symptom pattern
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2. Specimen Collection

- Examine:
 - Arthropods or fragments from:
 - Skin
 - Clothing
 - Bedding
 - Surroundings
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3. Histopathology

- Skin biopsy may show:
 - Arthropod parts
 - Characteristic inflammatory patterns
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4. Microbiological Tests

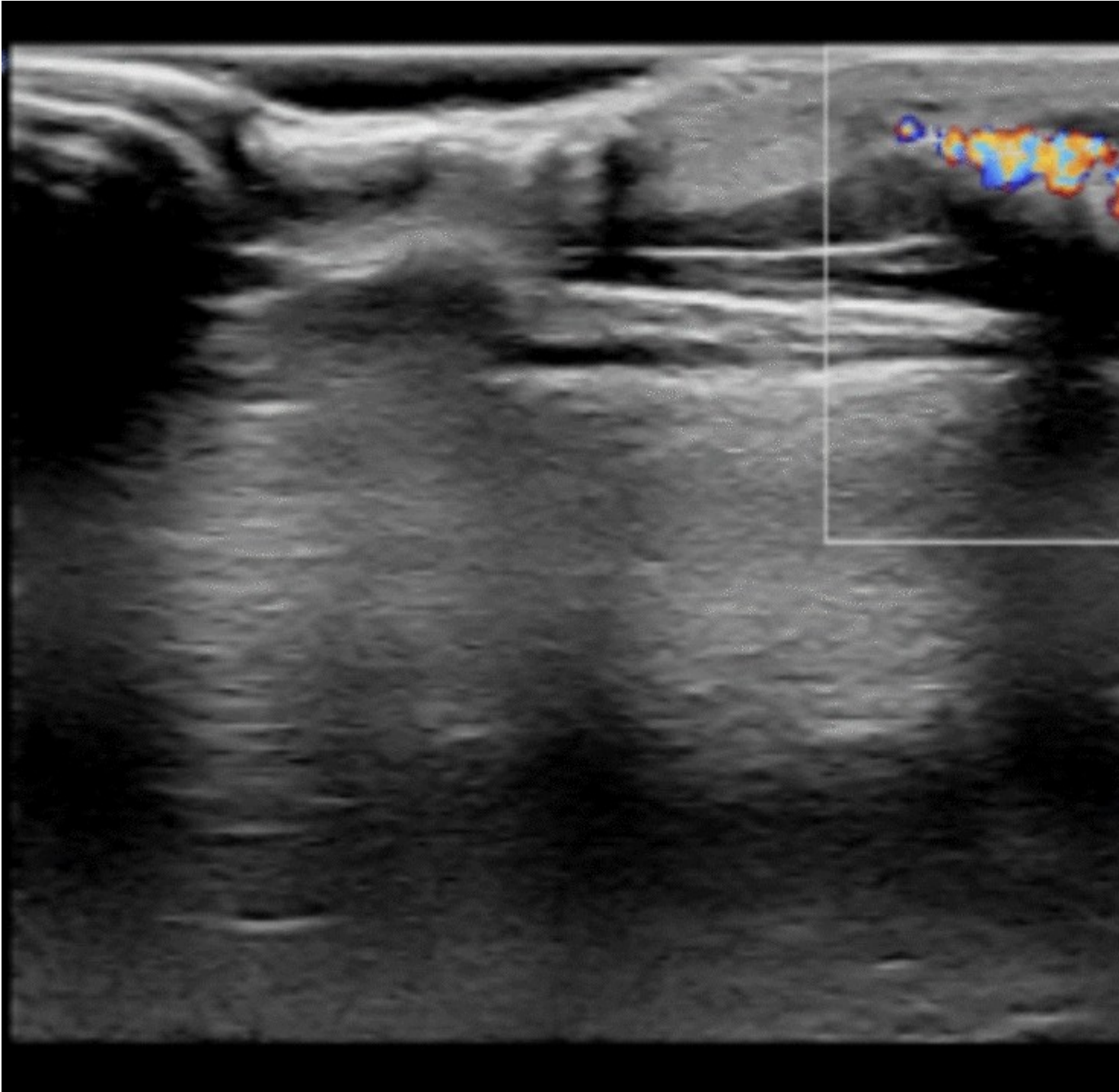
- Culture:
 - Detect **secondary bacterial infection**

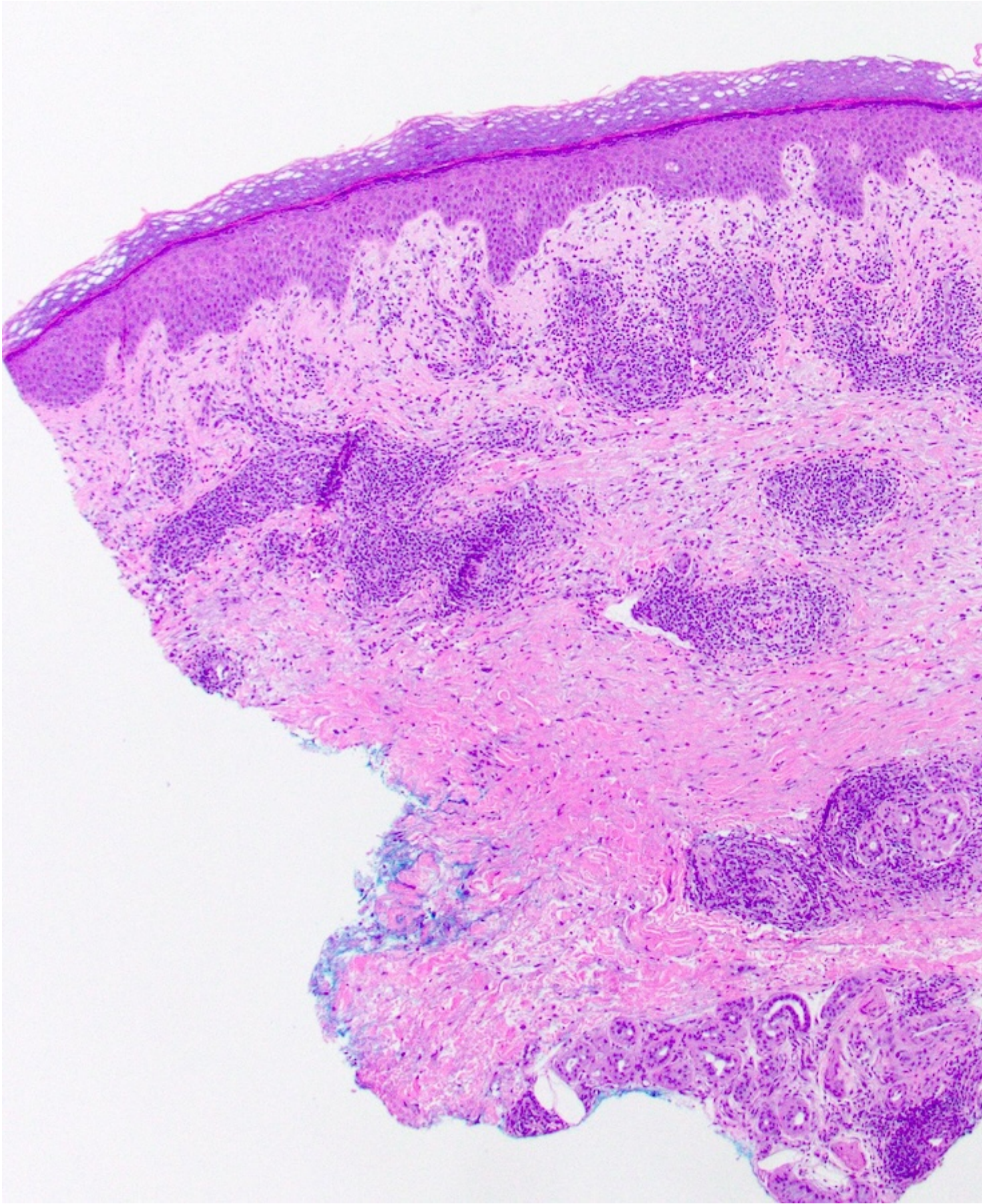
5. Serological Tests

- For **vector-borne diseases**:
 - Lyme disease
 - Malaria

6. Imaging

- Useful in:
 - **Myiasis**
 - To locate larvae within tissues







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Management

General Management

1. Wound Care

- Clean with:
 - Antiseptics

 - Remove:
 - Retained mouthparts

 - Arthropod remnants
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2. Symptomatic Relief

- **Cold compresses** ? reduce swelling
- **Antihistamines** ? relieve pruritus
- **Corticosteroids:**
 - Topical (mild–moderate)
 - Systemic (severe cases)

3. Treatment of Secondary Infection

- **Topical or oral antibiotics**
- For:
 - Cellulitis
 - Abscess

Specific Treatment

1. Envenomation

- **Antivenom:**
 - Severe snake or spider bites

2. Larval Removal (Myiasis)

- **Manual extraction**
- **Occlusion techniques:**
 - Petroleum jelly
 - Topical agents
 - ? Suffocate larvae before removal

3. Treatment of Vector-Borne Diseases

- Based on causative organism:
 - Antimalarials
 - Antibiotics
 - Antivirals

Prevention

Insect Repellents

1. Chemical Repellents

- DEET (N,N-diethyl-meta-toluamide)

- Picaridin
 - IR3535
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2. Natural Repellents

- Citronella oil
 - Eucalyptus oil
 - Neem oil (*less effective*)
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3. Usage Guidelines

- Apply to:
 - Exposed skin
 - Clothing
 - Avoid:
 - Damaged skin
 - Eyes and mouth
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General Prevention

1. Protective Measures

- Wear:

- Long sleeves
 - Full-length clothing
 - Use:
 - **Insecticide-treated nets** (*especially in malaria-endemic areas*)
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2. Environmental Control

- Eliminate:
 - Standing water (*mosquito breeding*)
 - Maintain:
 - Clean surroundings
 - Use of pesticides
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3. Public Awareness

- Education on:
 - Arthropod risks
 - Preventive strategies
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Key Takeaways

- ? Arthropod reactions range from **local papules to systemic anaphylaxis**
- ? Chronic cases may lead to **granulomas, ulcers, or infections**
- ? Diagnosis relies on **history + identification of arthropod source**
- ? Management includes **symptomatic care, infection control, and specific therapy**
- ? Prevention (repellents, clothing, environmental control) is **essential**