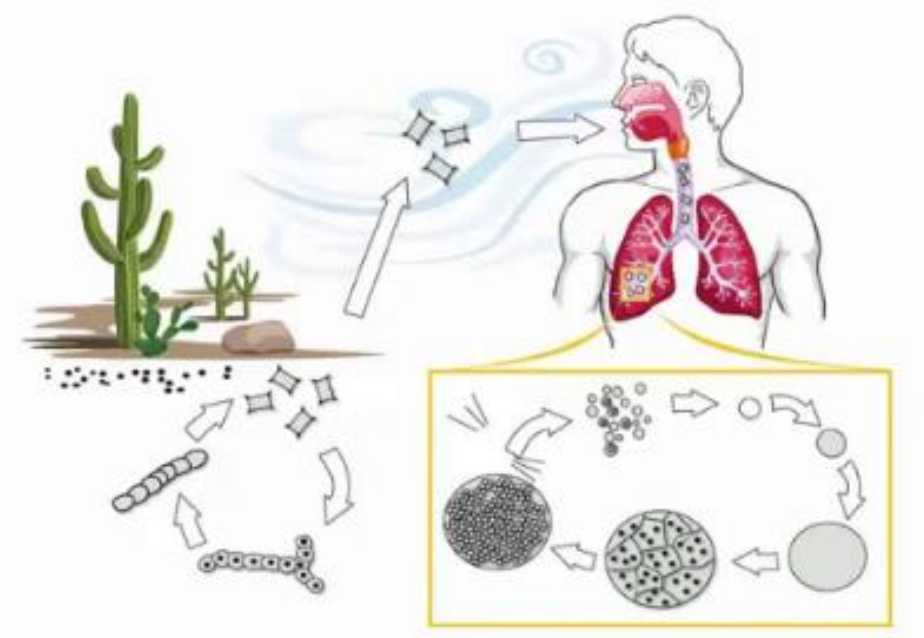
Coccidiomycosis

Microbiology III



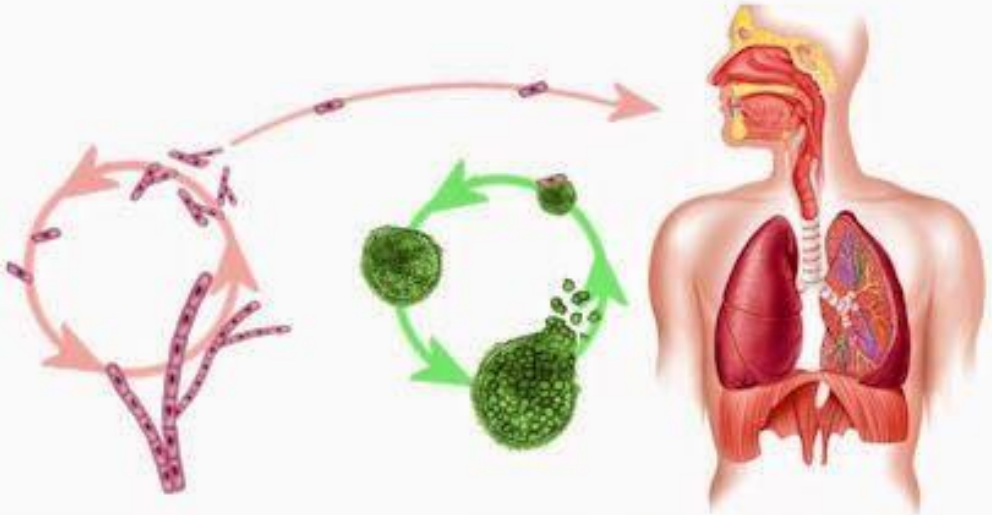
Coccidioidomycosis

- **Valley fever**, also called coccidioidomycosis, is an infection caused by the fungus ***Coccidioides***.
- *Coccidioides immitis* is a dimorphic imperfect fungus.
- It is more abundant on the **soil surface**.
- Southwestern United States and parts of Mexico and Central and South America.

- The agent invades the body via the **respiratory tract** by inhalation of **spores** under natural conditions or in the laboratory.

Life Cycle of Coccidioides

(Valley Fever Fungus)



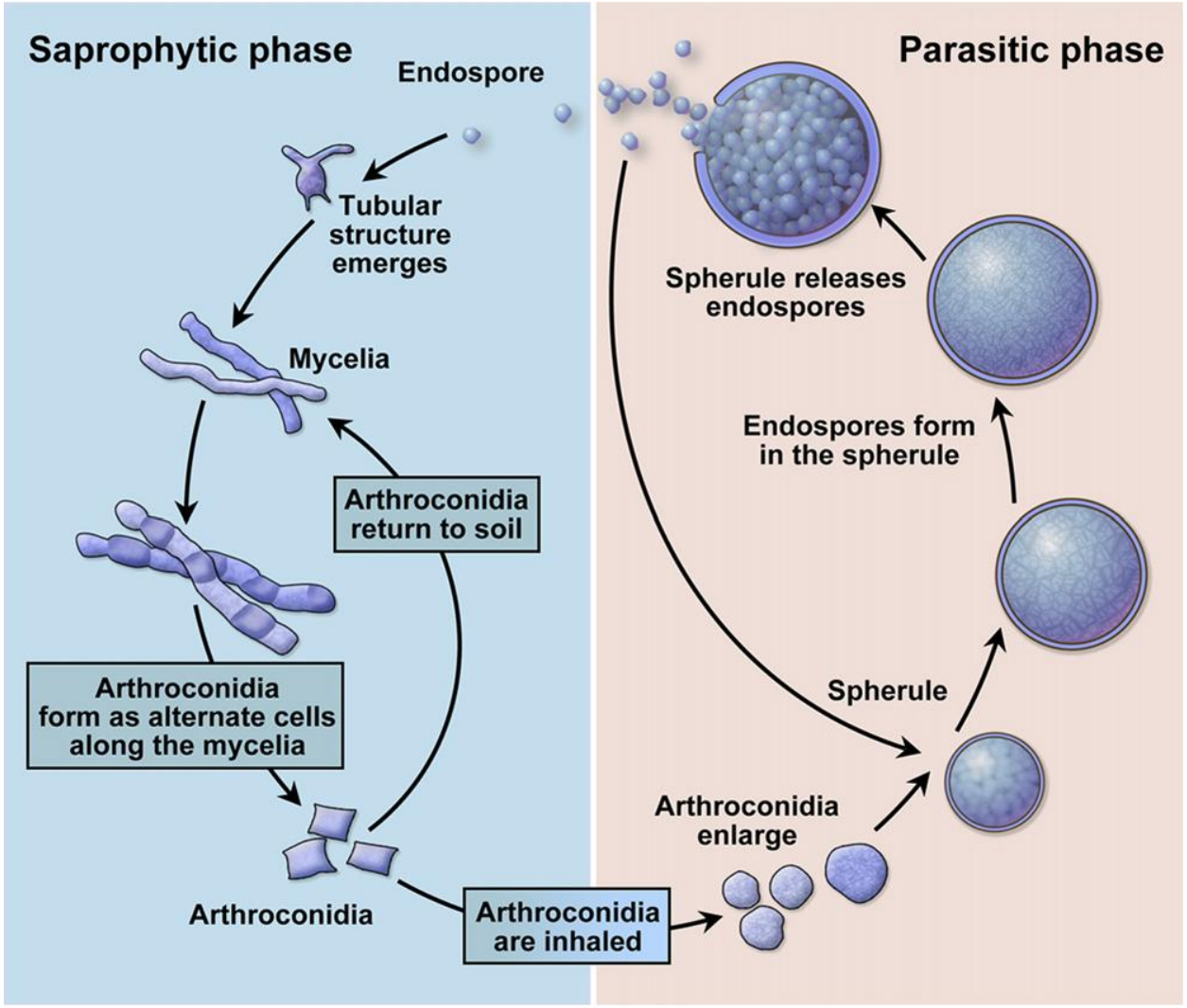
Saprophytic Cycle

Fungus grows as Mycelia, hairlike structures, on the desert floor. As they mature they separate and propogate. Some may become airborne and travel to new areas.

Parasitic Cycle

Airborn spores enter the lungs as underdeveloped spherules, the spherules mature and replicate into many new spores, divide and continue multiplication in the friendly environment of the lungs.

Life cycle of Coccidioides immitis



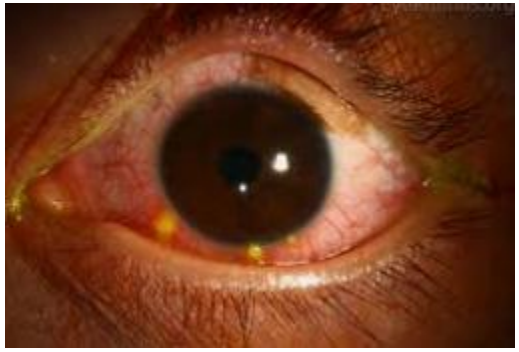
Clinical Features

1. Primary pulmonary coccidioidomycosis
2. Primary cutaneous coccidioidomycosis
3. Scrofuloderma coccidiodosum
4. Disseminated type

1. Primary Pulmonary Coccidioidomycosis

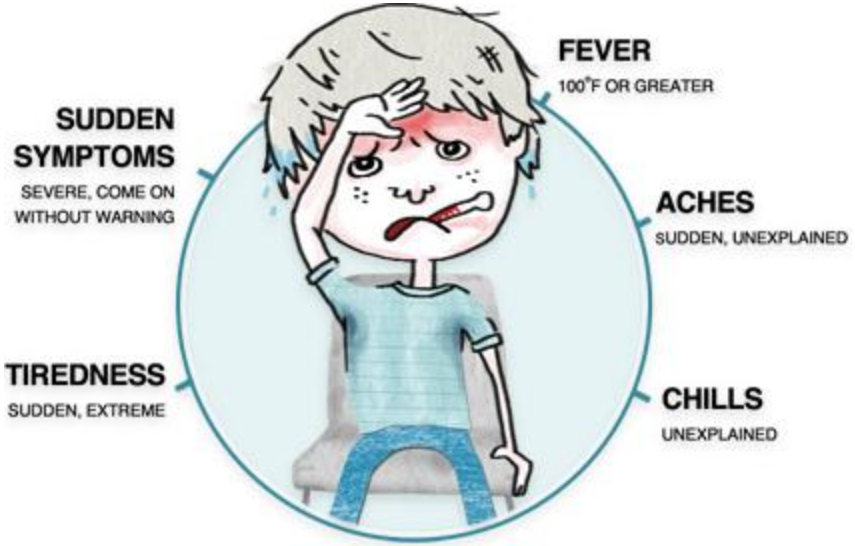
- Clinical manifestations vary in severity
- They range from a simple influenza like state to serious bronchopneumonia.

- ***San Joaquin Fever****:*
  - Influenza
  - Erythema nodosum - tender bumps (nodules) under the skin.
  - Phlyctenular conjunctivitis - Small, yellow-gray, raised bumps form on the eye.



Phlyctenular conjunctivitis

Erythema nodosum



Influenza

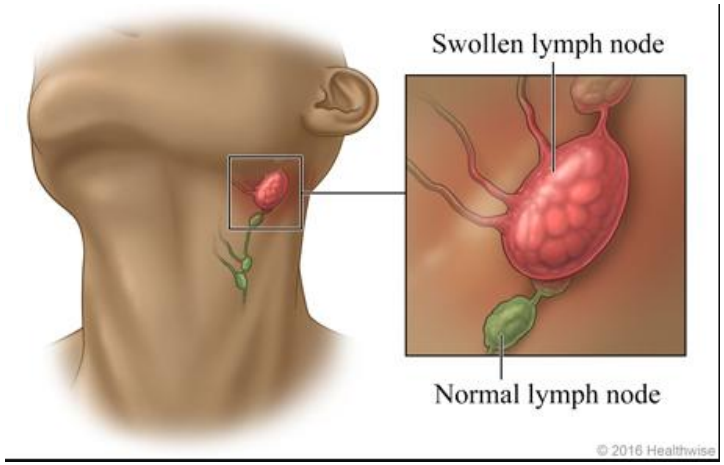
2. Primary Cutaneous Type

- The initial **lesion** is a nodule or plaque ulcerated at the centre
- Resembles a syphilitic, tuberculous or sporotrichotic chancre.
- The skin lesion may be accompanied by lymphangitis and regional lymph node involvement.

Primary cutaneous coccidioidomycosis showing lesions on skin

3. Scrofuloderma Coccidioidosum

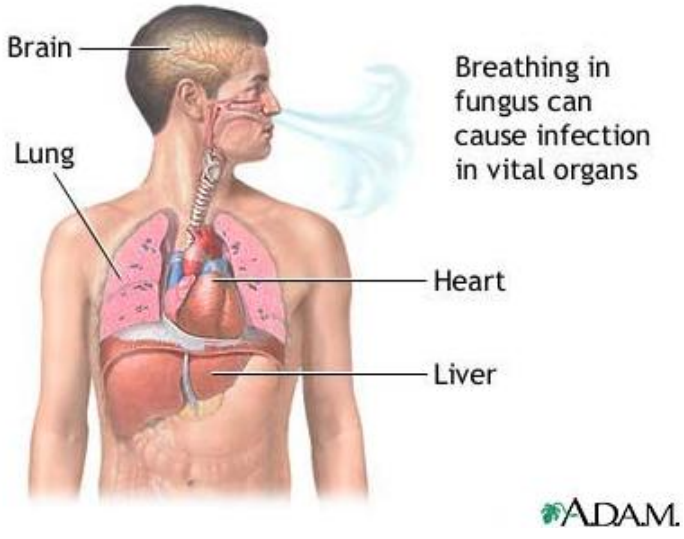
- Inflamed lymph nodes of the cervical (neck) region
- Coalesce and rupture through to the skin by proliferative and verrucous fistulae - warty lesion on skin
- Thus recalling the tuberculous scrofuloderma of classical pathology

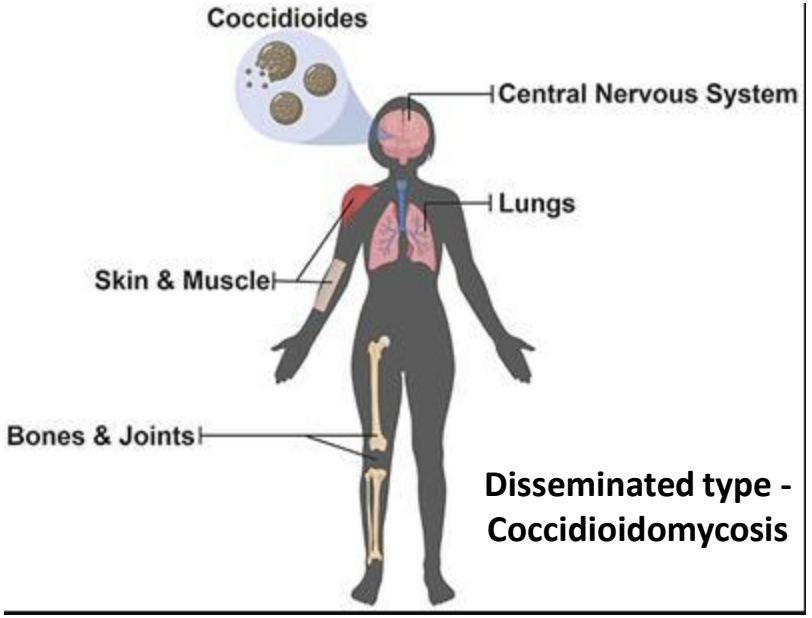


Scrofuloderma

4. Disseminated Type

- Haematogenous - carried by blood
- Starting from an active latent or residual pulmonary focus.
- Multiple osteoarticular lesions - **lesions** of the bone or soft tissue.
- Involvement of central nervous system along with many organs of the body takes place.





Laboratory Diagnosis

- Direct Microscopy:
- Sputum, gastric contents, spinal fluid exudate or pus.
- Examine the presence of round, thick walled spherules.
- 20-80 µm in diameter with many small endospores 2-5 µm in diameter.

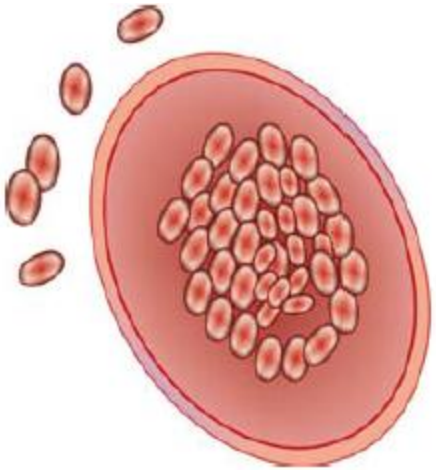
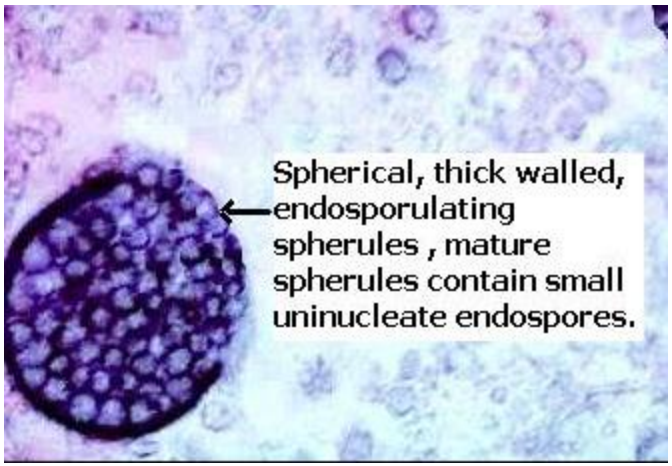


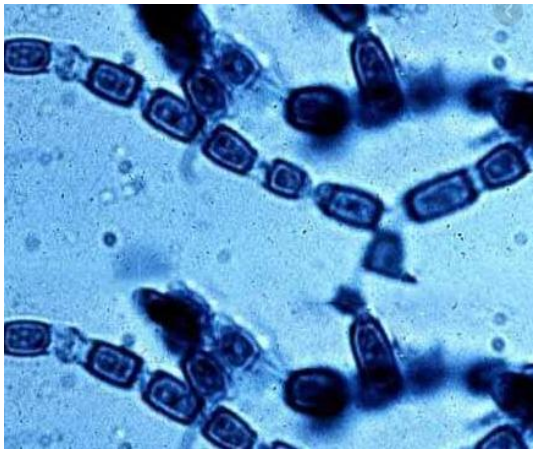
Fig. 76–37. Spherule stage of *C. immitis*



Culture:

- Infected material isolated at room temperature or 37°C
- Cultivated on Sabouraud's glucose agar
  - In a well-stoppered bottle or slant
  - with or without chloromycetein or actidione

- Colony : develops moderately rapid
  - 1st - moist, membranous culture
  - abundant aerial mycelium later develops
- Slide mounts: prepared - lactophenol cotton blue - culture containing saline
  - branching septate hyphae
  - chains of thick walled rectangular arthrospores



- Precaution - Spores are highly infectious.

Treatment

- Primary coccidioidomycosis:
  - Treatment generally unnecessary
- Severe / chronic coccidioidomycosis:
  - Antifungal agents effective
  - Prognosis generally good
- Disseminate coccidioidomycosis:
  - May require invasive or long term therapy
  - Prognosis poor to guarded

Antifungal treatment options for Coccidioidomycosis :

Table 3. COCCIDIOIDOMYCOSIS – TREATMENT OPTIONS[1,10]		
Drug	**Dosage**	**Route**
Amphotericin B	0.5 to 0.7 mg/kg daily	IV
Itraconazole	200 mg twice daily	PO
Fluconazole	400 to 800 mg daily	PO or IV
Ketoconazole	400 mg daily	PO
IV – intravenous; PO – oral		

Treatment for coccidioidomycosis:

Type	Treatment	Duration
Primary pulmonary	Monitoring in the majority of cases. **Fluconazole** (400-600 mg/day) with risk factors or prominent symptoms	3-6 months
Disseminated (skin, bones)	**Itraconazole** or in severe or refractory cases **Amphotericin B** (1-1.5 mg/ kg/ day)minimum 1 year	At least a year
Meningeal	**Fluconazole** (400-1000 mg/day) over a year; **Amphotericin B** in most cases for life	Over a year, in most cases for life