

LEPTOSPIROSIS

Synonyms

Mud / Swamp fever

Dairy worker
fever [*Leptospira
hardjo*]

Rice Field Fever

Haemorrhagic
Jaundice

Canicola Fever
caused by
Leptospira canicola

Stuttgart disease

Weil's
disease [*Leptospira
icterohaemorrhagiae*
]

Swine herd's
Disease

ETIOLOGY



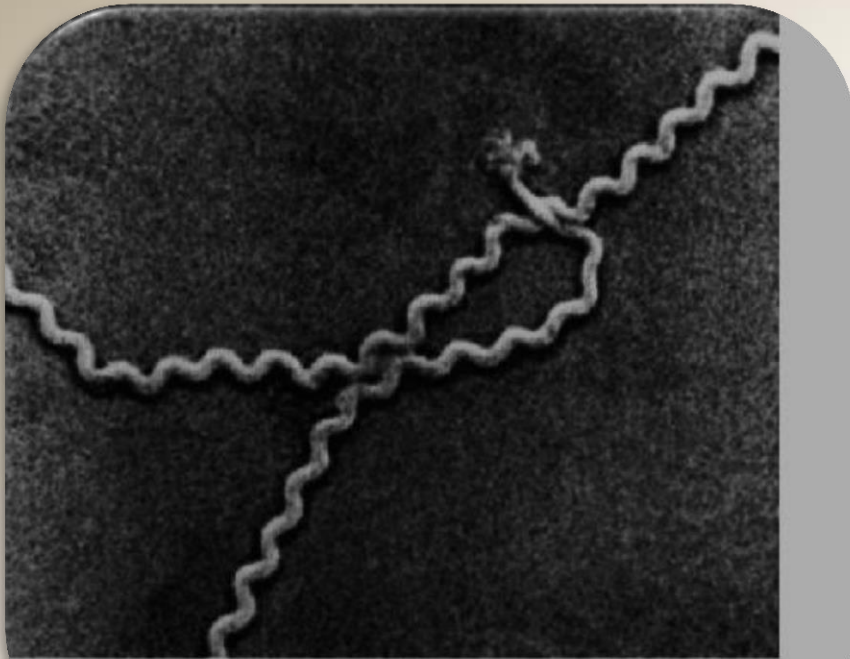
Genus – *Leptospira*

26 serogroups, 250 serovars

Dog-Leptospira canicola, *Cattle-Leptospira hardjo*,

Swine-Leptospira pomona, *Rats – Leptospira icterohaemorrhagiae*

Leptospira under the Microscope



- Corkscrew shaped
- Flexible
- Gram –ve
- Highly coiled
- Flagellate and motile
- Obligately aerobic
- Long and thin

Source: Fauci AS, Kasper DL, Braunwald E, Hauser SL, Longo DL, Jameson JL, Loscalzo J. *Harrison's Principles of Internal Medicine*, 17th Edition: <http://www.accessmedicine.com>

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HISTORY

- In 1886, **Adolf Weil** in Heidelberg observed the disease
- In 1907, **Stimson** used silver impregnation staining to the pathogen causing Weil's disease.
- In 1915, **Inada** demonstrated the etiology and isolated the *Leptospires*.

Modes of Transmission

1. Direct contact with urine or tissue of infected animal

Through skin abrasions, intact mucus membrane

2. Indirect contact

Broken skin with infected soil, water or vegetation

Ingestion of contaminated food & water

3. Droplet infection

Inhalation of droplets of infected urine



Rodent carriers



Leptospira in urine



Contaminated mud, soil



Leptospira spp.

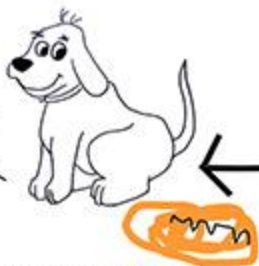
Free-living leptospira

Risk factors:

- Contact with animals
- Butchering
- Hunting
- Farming



Human infection



Leptospira in urine

Human infection



Risk factors:

- Water sport
- Fishing
- Bathing
- Swimming
- Rice farming

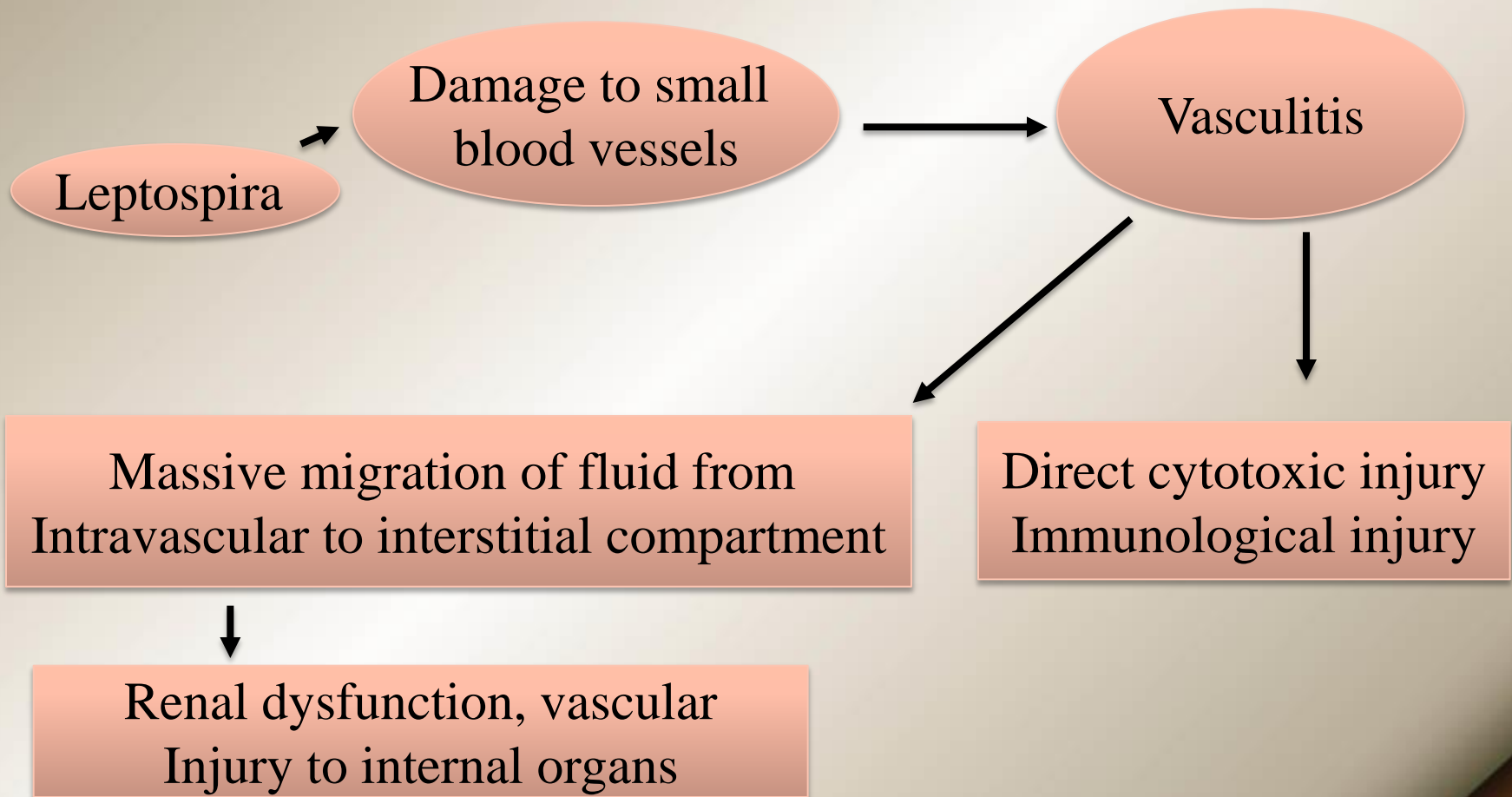


Mammalian reservoirs
(wild and domestic animals)

Reservoirs and incidence

- Rodents
 - (Rattus rattus, Rattus norvegicus, Mus musculus)
- Dogs
- Wild animals
- Domesticated animals
- Caged game animals
- Leptospira are excreted in the urine

PATHOGENESIS





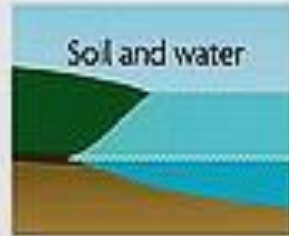
Asymptomatic rodent carriers



Wild animals



Livestock and domestic animals



Soil and water

Uveitis

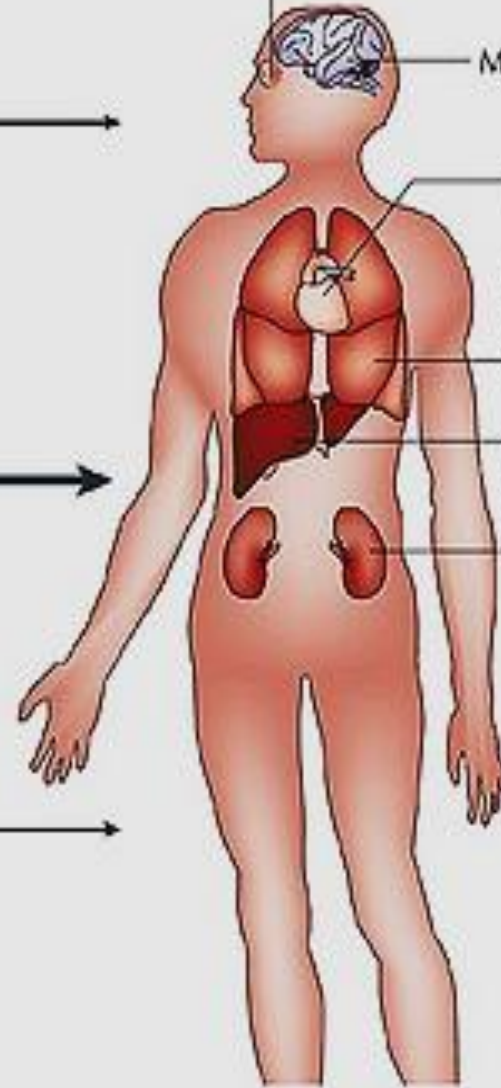
Meningitis

Myocarditis

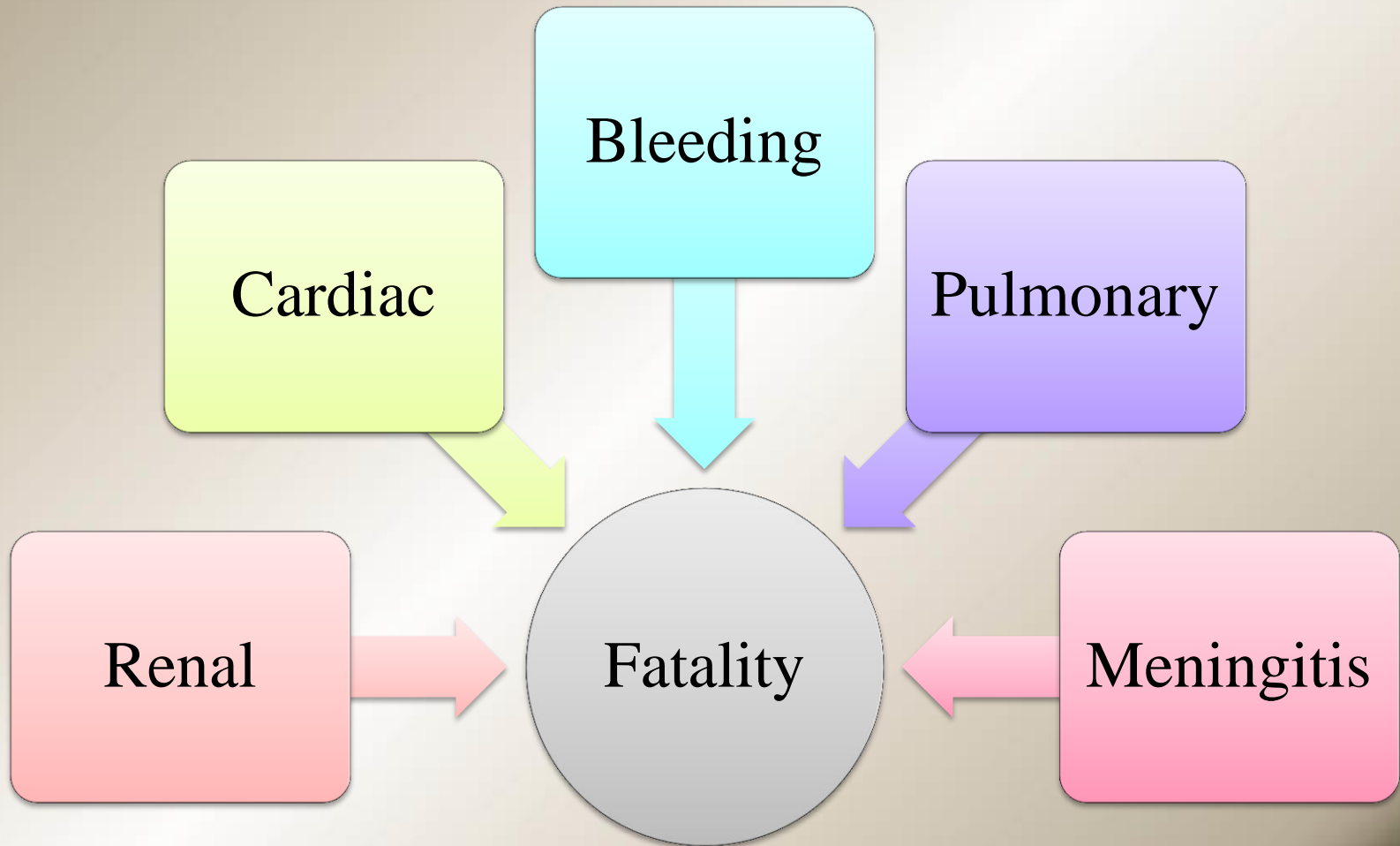
Pulmonary haemorrhage syndrome

Hepatic dysfunction

Renal dysfunction



Prognosis and Mortality



DISEASE IN MAN

- Incubation period ranges from 2 days to 10 days.
- Two phase of infection –
 - 1. Bacteremic phase [leptospiraemic phase] for 7 to 10 days
 - 2. Leptospiruric phase for a week to month

TWO CLINICAL FORMS ARE PRESENT IN MAN

Icteric form or weil's disease

- Hepatomegaly and jaundice.
- Renal insufficiency with oliguria or anuria
- Conjunctivitis and myalgia
- Icterus, fever and vomiting

Anicteric forms

- Biphasic illness
- Impaired renal and hepatic function
- Leukocytosis, weakness, chills and fever

ANIMALS

- Cattle
- Pigs
- Dog & cats
- Horses
- Sheep
- Goats

DISEASE IN CATTLE

- It may be acute, subacute or chronic infection.
- *Leptospira pomona* and *Leptospira hardjo* are pathogens in cattle, causing abortion.
- **Clinical signs-** Fever and anorexia
- milk drop syndrome or haemorrhagic mastitis, haemoglobinuria.
Jaundice and haemolytic anaemia occurs with enlarged liver and swollen kidney
- Pregnant cows abort with retention of the placenta.

DISEASE IN PIGS, DOGS AND CATS

- Causes abortion and birth of weak piglets and infertility.
- *Leptospira cunicola* and *Leptospira icterohaemorrhagiae* are important pathogens of dogs.
- Gastroenteritis, jaundice and nephritis may occur.
- Acute haemorrhagic form, icteric form and uremic form [Stuttgart's disease] have been recognized.

DISEASE IN HORSES, SHEEP AND GOATS

- *Leptospira pomona* causes abortion and still births in horses.
- Periodic ophthalmia [moon blindness, iridocyclitis].
- Acute septicemia causes in sheep and goats.

DIAGNOSIS

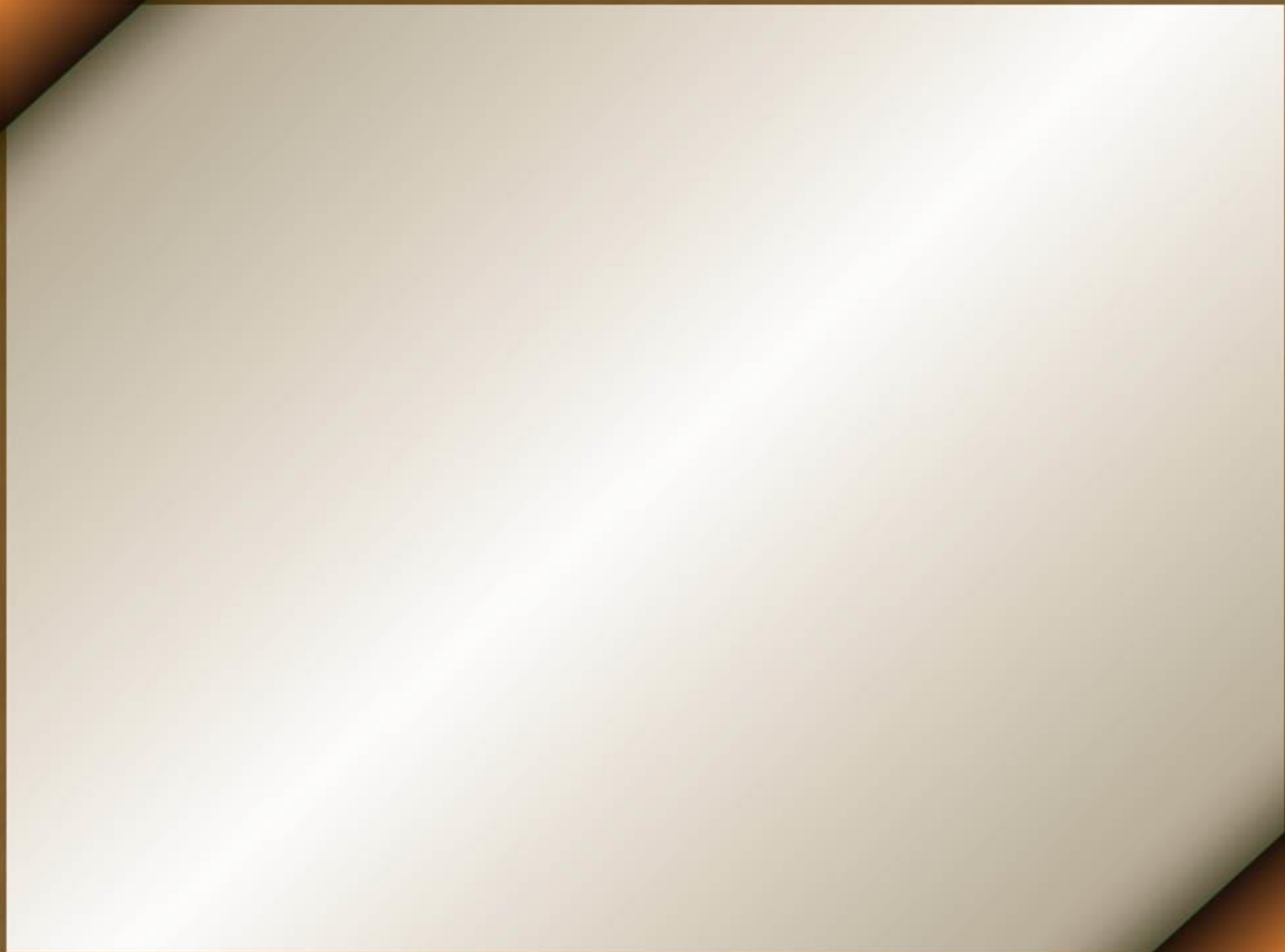
- History and clinical signs.
- ‘Dark field microscopy’ examination of urine or serum at early stage of the disease.
- Microscopic agglutination test- It is a ‘gold standard test’.
- Culture and identification in EMJH [Ellinghausen McCullough Johnson and Harris] medium.
- On semisolid or liquid medium the growth of Leptospire

Leptospira under the Microscope

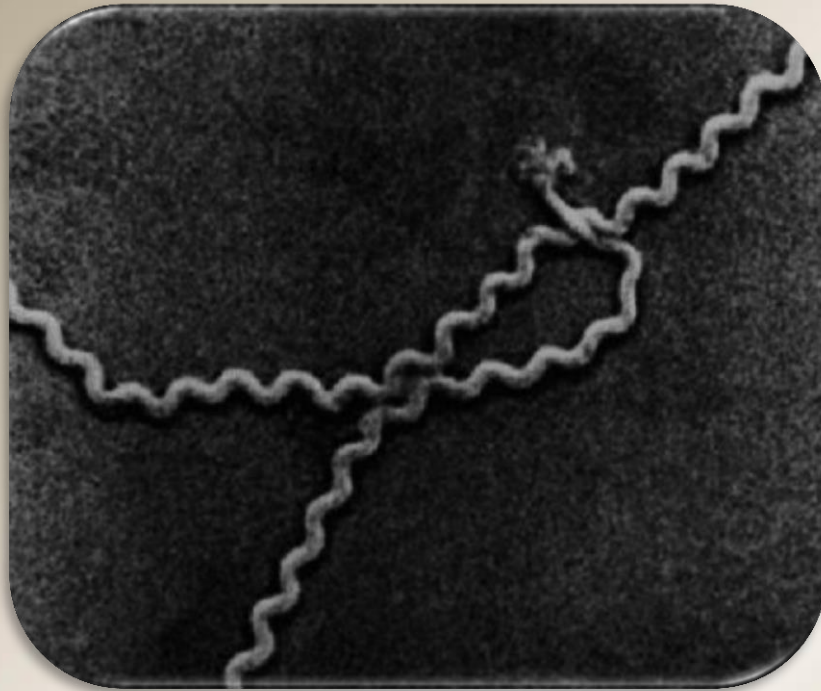
Dark Field Microscopy FL



Long, Thin, Highly Coiled

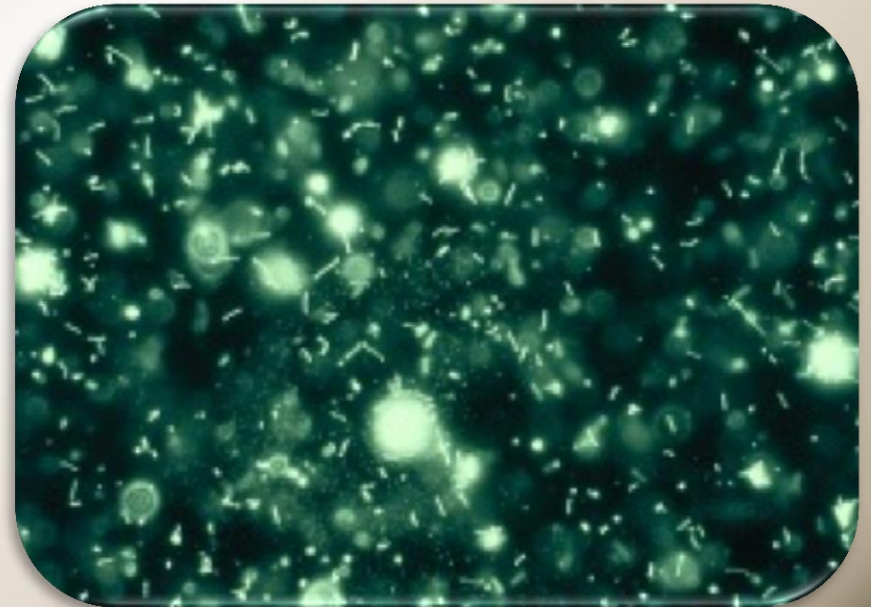


Leptospira under the Microscope



Long, Thin, Highly Coiled

Dark Field Microscopy FL



PREVENTION & CONTROL

- Rodent control.
- Avoid swimming in or drinking from potentially contaminated water.
- Protect workers by providing boots and gloves.
- Doxycycline chemoprophylaxis for persons at high exposure.

TREATMENT

- Penicillin –

In dog 25000-40000 unit/kg I/M, 5 to 7 days

- * Corticosteroid

- * Doxycycline

In adults 100mg orally twice daily

In children 8 years of age 2mg/kg per day
in two equally divided doses

- Azithromycine
- In adult 500 mg orally once daily for 3 days
- In children 10 mg/kg orally on day one
- In pregnant women 25 to 50 mg/kg in 3 equally divided doses.

