

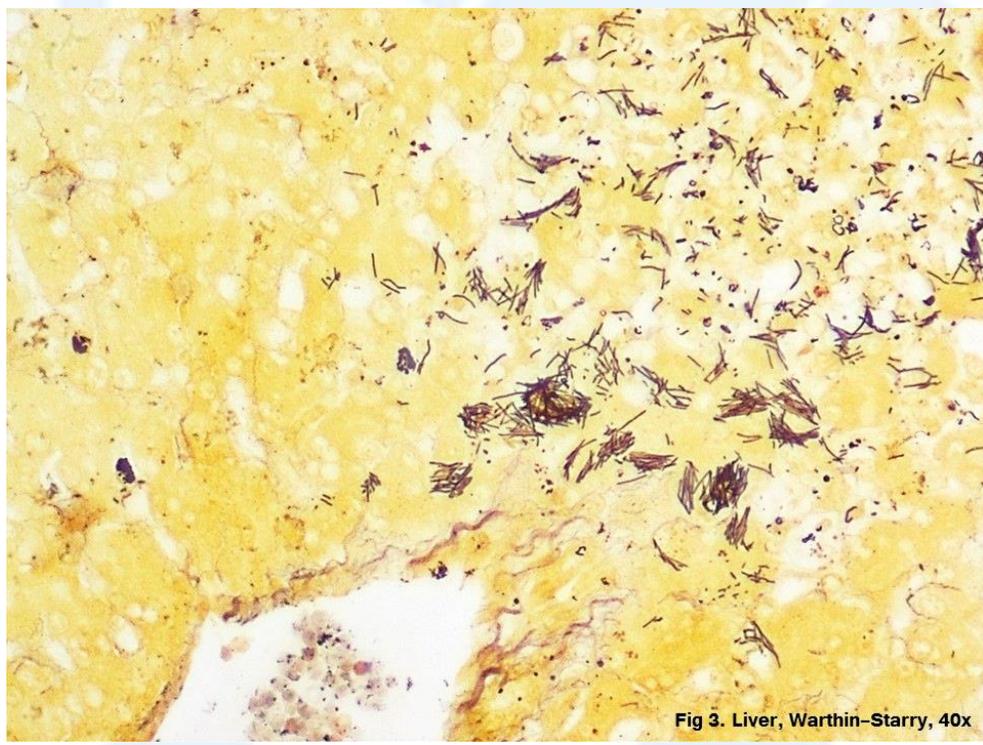
# Diagnostic Exercise

## From The Davis-Thompson Foundation

**Case #: 90 Month: February Year: 2018**

*Answer Sheet*

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**Fig 3. Liver, Warthin-Starry, 40x**

**1) Histological description:** Liver - There are multiple random foci of necrosis containing inflammatory cells that are primarily neutrophils. Occasional hepatocytes, particularly those at the viable - necrotic tissue interface contain intracytoplasmic ghost profiles (unstained) of bacteria packed in clusters and stacks. There is also moderate bile stasis.

**2) Morphologic diagnosis:** Liver: Multifocal necrotizing and suppurative hepatitis.

**3) Cause:** *Clostridium piliforme*.

**4) Name the disease:** Tyzzer's disease.

**5) Histochemical findings:** Silver stains reveal stacks of bacillus-shaped bacteria in hepatocytes near areas of necrosis in the liver.

**Typical gross findings:**

1. Liver: White, gray or yellowish foci of necrosis, up to 2 mm in diameter, few to many, widespread.

**Typical microscopic findings:**

1. Liver: Numerous random foci of necrosis with neutrophilic hepatitis.
2. Silhouettes of crisscross to "hay stack" long argyrophilic bacilli within the cytoplasm of viable hepatocytes at the periphery of the necrotic foci.

**Discussion:** Since first described in mice in 1917, Tyzzer's Disease has been diagnosed primarily in laboratory mammals, including rabbits, guinea pigs, hamsters, gerbils and rats. It is also a highly fatal disease of young foals; however, it is rare in dogs and other domestic animals. The disease agent is *Clostridium piliforme*, a motile, spore-forming, rod-shaped, flagellated, obligate intracellular bacterium. Spores may survive in soil at room temperature for over a year and are resistant to some disinfectants including 70% ethanol, 4% chlorhexidine, and 0.037% formaldehyde. *Clostridium piliforme* appears to be common in the environment but, because it is difficult to culture, there is little knowledge of the epidemiology, pathogenesis, and immunity. Infection most likely results from oral exposure to environmental spores. The feces of infected and carrier animals are the primary source of spores that contaminate the environment. In species in which the disease is more common, the primary site of infection is the lower intestinal tract with subsequent dissemination via the blood or lymphatics to the liver and heart. In multiple sections of small intestine of this puppy, the villi were blunted and fused, while the lamina propria was infiltrated by neutrophils and monocytes. Dilated crypts throughout the sections of intestine were filled with neutrophils and cellular necrotic debris. Bacteria including stacks of long rod-shaped bacteria (bacilli) were apparent in some of these crypts. There was also depletion of lymphocytes in the gut-associated lymphoid tissue (GALT). Stress from capture, overcrowding, shipping, and poor sanitation appear to be predisposing factors of the disease.

**References and Recommended literature:**

1. Jubb, Kennedy & Palmer's Pathology of Domestic Animals, 6th Edition, Volume 2, page 317.

2. Zachary & McGavin's Pathological Basis of Veterinary Disease, 6th Edition, page 443.

\*The Diagnostic Exercises are an initiative of the **Latin Comparative Pathology Group (LCPG)**, the Latin American subdivision of The Davis-Thompson Foundation. These exercises are contributed by members and non-members from any country of residence. Consider submitting an exercise! A final document containing this material with answers and a brief discussion will be posted on the CL Davis website ([http://www.cldavis.org/diagnostic\\_exercises.html](http://www.cldavis.org/diagnostic_exercises.html)).

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