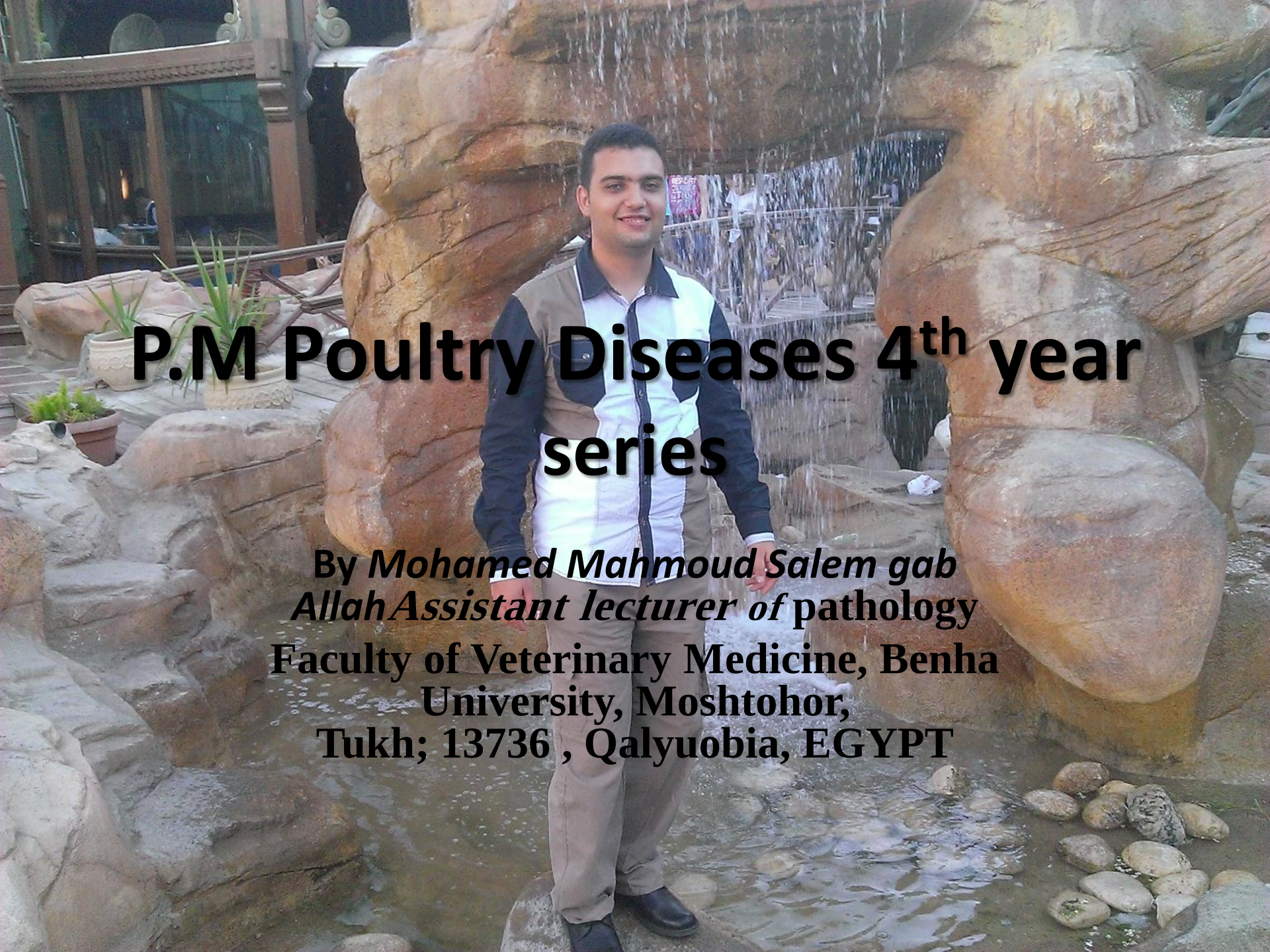


P.M Poultry Diseases 4th year series

By *Mohamed Mahmoud Salem gab Allah* *Assistant lecturer of* pathology
Faculty of Veterinary Medicine, Benha University, Moshtohor,
Tukh; 13736 , Qalyuobia, EGYPT

avian influenza

avian influenza

- Clinical Description
- **This image was taken 2 days post experimental inoculation with highly pathogenic avian influenza. The bird is showing signs of general depression, exhibiting huddling behavior and a reluctance to stand or move. There is ruffling of the feathers on the dorsal neck, indicative of fever associated with the infection. The dark red areas on the comb and wattles are ecchymotic hemorrhages.**

avian influenza

- Morphologic Diagnosis
- **Vent: Diarrhea**
- Clinical Description
- **This image was taken 2 days post experimental inoculation with highly pathogenic avian influenza. Pay attention to mild soiling of the feathers around the vent, as seen here, as this can provide a valuable clue, indicating the presence of mild early diarrhea. Chickens infected with AI often exhibit diarrhea. The diarrhea typically begins with bright green watery feces. As the disease progresses, feces may become totally white.**
- Pathologic Description
- **There is a small amount of loose, watery feces around the vent**

avian influenza

- Clinical Description
- **This image was taken 1 day post experimental inoculation with highly pathogenic avian influenza. The bird has diarrhea.** As is typical of the early stages of AI, the diarrhea is watery, with bright green staining, caused by bile pigment. Diuresis has also resulted in an excessive amount of white uric acid in the feces. As the disease progresses, the feces may become totally white.

avian influenza

- Morphologic Diagnosis
- **Comb: Dehydration, mild acute multifocal hemorrhage**
- Clinical Description
- **This image was taken 2 days post experimental inoculation with highly pathogenic avian influenza. The comb is dry and wrinkled, indicating dehydration, and mild hemorrhages are beginning to develop on the comb.**
- Pathologic Description
- **The skin of the comb is slightly wrinkled and dry and the subcutaneous tissue is mottled by ill defined dark red foci.**

avian influenza

- Morphologic Diagnosis
- **Skin: Mild acute hemorrhage and congestion**
- Clinical Description
- **This image was taken 2 days post experimental inoculation with highly pathogenic avian influenza. There are mild ecchymotic hemorrhages beginning to develop on the wattles.**
- Pathologic Description
- **The wattle skin is discolored by multiple, often coalescing, irregularly shaped, ill defined red foci**

avian influenza

- Morphologic Diagnosis
- **Comb: Moderate diffuse edema with multifocal acute hemorrhage and congestion**
- Clinical Description
- **This image was taken 2 days post experimental inoculation with highly pathogenic avian influenza. In this detailed view of the comb, edema and small hemorrhages can be seen. These lesions form as microthrombi develop within the dermal vessels of the nonfeathered skin. Thrombi lead to vasculitis, perivascular edema,subcutaneous edema, and finally necrosis of the capillary endothelium. The degree of edema, hemorrhages, and necrosis present will depend on the stage of this process.**
- Pathologic Description
- **The subcutaneous tissues of the comb are slightly swollen and reddened. The comb is stippled by numerous, small, often coalescing faint red foci.**

avian influenza

- Morphologic Diagnosis
- **Comb and wattles: Mild edema, cyanosis and hemorrhage. Skin: Dehydration.**
- Clinical Description
- **This image was taken 2 days post experimental inoculation with highly pathogenic avian influenza. Birds infected with AI typically experience a significant drop in water and feed consumption. The subsequent dehydration, is often easiest to observe on the nonfeathered skin of the comb and wattles. The skin of the comb, as seen here, becomes dry and wrinkled.**
- Pathologic Description
- **The skin is dry slightly wrinkled. The subcutaneous tissues of the comb and wattles are slightly swollen. The comb and wattles are stippled by numerous, small, often coalescing faint red foci and the edges of the tissue are slightly purple.**

avian influenza

- Clinical Description
- **This image was taken 2 days post experimental inoculation with highly pathogenic avian influenza. A 6 week old male is standing among several deceased 70 week old hens. The older females succumbed more rapidly to the HPAI than the younger males, due to the physiologic stress associated with molting. In HPAI, the duration of onset of clinical signs and severity of signs will vary depending on factors such as species, age, physiologic stress, and concurrent infections. As demonstrated here, HPAI is marked by high morbidity and mortality. Of the 20 chickens inoculated experimentally, 19 died within 5 days of exposure to the infection. Some birds infected with HPAI die peracutely, showing no clinical signs prior to being found dead.**

avian influenza

- Morphologic Diagnosis
- **Subcutaneous tissues, eyelids: Mild edema. Wattle and combs: Edema and congestion.**
- Clinical Description
- **This image was taken 1 day post experimental inoculation with highly pathogenic avian influenza. This bird is exhibiting severe general depression. The swelling of the structures of the head (comb, wattles, and periocular regions) are one of the most frequent external findings associated with highly pathogenic avian influenza.**
- Pathologic Description
- **The subcutaneous tissues of the head are swollen. The eyelids are thickened, causing them not to open all the way. The wattle and comb are bright red and the comb is slightly swollen. The feather loss is due to normal molting.**

avian influenza

- Morphologic Diagnosis
- **Comb: Acute edema and congestion**
- Clinical Description
- **This image was taken 1 day post experimental inoculation with highly pathogenic avian influenza. The subcutaneous swelling of the comb, seen here, is a common finding associated with AI virus replication and necrosis of vascular endothelial cells.**
- Pathologic Description
- **The comb of this bird is irregularly swollen and the more swollen areas are redder than the surrounding tissue.**

avian influenza

- Morphologic Diagnosis
- **Wattle: Moderate diffuse edema with locally extensive hemorrhage**
- Clinical Description
- **This image was taken 2 days post experimental inoculation with highly pathogenic avian influenza. In this detailed view of the wattles, large ecchymotic hemorrhages are visible.**
- Pathologic Description
- **The subcutaneous tissues of the wattle is swollen and the entire region is reddened with a locally extensive area being discolored dark red to purple.**

avian influenza

- Morphologic Diagnosis
- **Skin (legs): Multiple acute ecchymoses**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. One of the most frequent findings associated with HPAI is swelling and hemorrhages of the legs and feet. Here, ecchymotic hemorrhages are present on the skin over the intertarsal (hock) joint.**
- Pathologic Description
- **There are multiple, variably sized sometimes coalescing red foci in the subcutaneous tissue surrounding the intertarsal joint.**

avian influenza

- Morphologic Diagnosis
- **Skin (legs): Multiple acute ecchymoses**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. One of the most frequent findings associated with HPAI is swelling and hemorrhages of the legs and feet. Here, ecchymotic hemorrhages are present on the skin over the intertarsal (hock) joint.**
- Pathologic Description
- **There are numerous, coalescing red areas in the subcutaneous tissues surrounding the intertarsal joint.**

avian influenza

- Clinical Description
- **This image was taken 2 days post experimental inoculation with highly pathogenic avian influenza. This bird is showing evidence of mild depression, with drooping wings and a reluctance to move. The feathers on the dorsal neck are ruffled, consistent with a fever. The feces have an orange tinge, caused by sloughing of the intestinal mucosa.**

avian influenza

- Morphologic Diagnosis
- **Vent: Mild edema. Skin: Mild congestion.**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. In this infected individual, there is only mild soiling of the feathers around the vent. Not all individuals within the flock will develop significant diarrhea.**
- Pathologic Description
- **The skin surrounding the vent is slightly red and the mucosal surface of the vent is slightly swollen and wet.**

avian influenza

- Morphologic Diagnosis
- **Vent and skin: Diarrhea with marked subcutaneous edema, and erythema**
- Clinical Description
- **This image was taken 1 day post experimental inoculation with highly pathogenic avian influenza. AI is often associated with diarrhea, as seen here. Diarrhea may result in soiling of the skin and feathers surrounding the vent.**
- Pathologic Description
- **The vent and the surrounding tissues are covered by loose, dried, yellow feces. The skin and subcutaneous tissues surrounding the vent are slightly swollen and mottled by pale and reddened areas.**

avian influenza

- Morphologic Diagnosis
- **Cloaca: Severe acute diffuse mucosal hemorrhage and edema.**
- Clinical Description
- **This image was taken 2 days post experimental inoculation with highly pathogenic avian influenza. In highly pathogenic avian influenza, the virus has wide spread tissue tropism, resulting in the inflammation and necrosis of many different tissues and organs. In this chicken, there are severe hemorrhages and necrosis of the cloaca.**
- Pathologic Description
- **The vent is dilated, revealing the dark red, swollen cloacal mucosa. The lack of feathers around the vent is due to normal molting.**

avian influenza

- Morphologic Diagnosis
- **Eyelids: Diffuse edema. Comb: Diffuse edema, congestion and cyanosis. Wattle: Acute diffuse hemorrhage.**
- Clinical Description
- **This image was taken 2 days post experimental inoculation with highly pathogenic avian influenza. As seen here, subcutaneous edema of the periocular region often prevents the lids from fully opening, giving the eyes an â€œalmond-shapedâ€appearance.**
- Pathologic Description
- **The eyelids of this bird are swollen and unable to fully open. The wattles and comb are slightly swollen and discolored red to purple. The wattle is particularly reddened.**

avian influenza

- Morphologic Diagnosis
- **Upper eyelid: Mild edema**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. Periorbital edema is a common finding in HPAI.**
- Pathologic Description
- **The upper eyelid is slightly swollen without signs of redness. This indicates the accumulation of fluid in the tissue.**

avian influenza

- Morphologic Diagnosis
- **Comb: Mild multifocal necrosis and cyanosis**
- Clinical Description
- **This image was taken 2 days post experimental inoculation with highly pathogenic avian influenza. The tips of the comb are beginning to show signs of early necrosis and cyanosis. These lesions form as microthrombi develop within the dermal vessels of the nonfeathered skin. Thrombi lead to vasculitis, perivascular edema, subcutaneous edema, and finally necrosis of the capillary endothelium. The degree of edema, hemorrhages, and necrosis present will depend on the stage of this process.**
- Pathologic Description
- **The tips of the comb are dry, shrunken and slightly blue. The changes are particularly evident on the second tip from the right. In this area, the skin is slightly purple and the tip is constricted, slightly brown and covered by several petechia. The outer-most extent of the tip is brown and dry.**

avian influenza

- Morphologic Diagnosis
- **Skin (comb): Multiple acute ecchymoses and multifocal necrosis**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. In this detailed view of the comb, there are ecchymotic lesions with mild necrosis developing on the tips of the comb.**
- Pathologic Description
- **There are several, variably sized poorly defined red areas in the subcutaneous tissue of the comb. The tips of the comb are slightly dry, brown, and contracted. This change is particularly prominent on the second tip from the right.**

avian influenza

- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. The birds are exhibiting general depression with decreased activity and increased sleeping. Accompanying this drop in activity is normally a decrease in food and water consumption.**

avian influenza

- Morphologic Diagnosis
- **Subcutaneous tissues (wattles, comb, legs): Severe acute ecchymoses. Subcutaneous tissue (face, eyes): Moderate edema**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. In HPAI, as seen here, severe depression, with a reluctance to stand or move, is commonly observed. Swelling and ecchymoses on the comb, wattles, and legs are also common findings. Birds with fever often have ruffled feathers over their dorsal neck region.**
- Pathologic Description
- **This depressed bird exhibits ruffled feathers and is sitting back on its intertarsal joints. There are large, dark red foci in the subcutaneous tissues of the wattles, comb and legs. The face and eyes are swollen.**

avian influenza

- Morphologic Diagnosis
- **Subcutaneous tissue (comb, wattles): Severe acute multifocal hemorrhage with edema. Subcutaneous tissue (face, eyes): Moderate edema**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. The degree of edema, hemorrhages, and necrosis present on the comb and wattles will depend on the stage of this disease. Here, severe edema and hemorrhages are observed.**
- Pathologic Description
- **Within the subcutaneous tissues of the comb and wattles there are large, poorly demarcated dark red areas. The wattles are slightly swollen and the periocular and eyelid skin is swollen.**

avian influenza

- Morphologic Diagnosis
- **Skin (comb): Severe acute ecchymoses. Face (skin and eyelids): Moderate edema**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. Detailed view of an ecchymotic lesion on the comb.**
- Pathologic Description
- **There is a large, ill defined dark purple area on the cranial aspect of the comb. The face and the eyelids are swollen.**

avian influenza

- Morphologic Diagnosis
- **Wattles: Severe acute locally extensive hemorrhage**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. Detailed view of typical ecchymotic lesions on the wattles.**
- Pathologic Description
- **There are large, well demarcated, irregularly shaped dark red discolorations on the ventral wattle**

avian influenza

- Morphologic Diagnosis
- **Skin (wattle): Marked acute hemorrhage**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. Detailed view of an ecchymotic hemorrhagic lesion on the wattle.**
- Pathologic Description
- **Within the subcutaneous tissues of the comb there is a large, poorly demarcated dark red area.**

avian influenza

- Morphologic Diagnosis
- **Skin (comb): Marked acute hemorrhage and congestion. Skin: Dehydration.**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. Detailed view of an ecchymotic lesion on the comb.**
- Pathologic Description
- **Within the skin and subcutaneous tissue of the comb there are numerous purple areas. The skin is dry and slightly wrinkled.**

avian influenza

- Morphologic Diagnosis
- **Skin: Severe acute locally extensive hemorrhage**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. As seen here, ecchymotic hemorrhages may extend along the lateral shanks of the legs.**
- Pathologic Description
- **The skin of the lateral tarsometatarsus contains a large, linear red to purple lesion.**

avian influenza

- Morphologic Diagnosis
- **Skin: Severe acute locally extensive hemorrhages. Metatarsal and tarsal pads: Severe edema.**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. Swelling of the feet, due to subcutaneous edema, is a common finding associated with HPAI.**
- Pathologic Description
- **The skin of the lateral tarsometatarsus contains large, linear red to purple lesion. The metatarsal and proximal tarsal pads are markedly swollen.**

avian influenza

- Morphologic Diagnosis
- **Skin: Severe acute locally extensive hemorrhage**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. Detailed view of the leg showing hemorrhages on lateral aspect of the shank.**
- Pathologic Description
- **The skin of the lateral tarsometatarsus contains large, linear red to purple lesion.**

avian influenza

- Morphologic Diagnosis
- **Comb and wattles: Moderate acute multifocal hemorrhage**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. Typical ecchymotic hemorrhagic lesions on the comb and wattle. Open-mouth breathing, indicating respiratory distress, is caused by extensive respiratory involvement in some birds.**
- Pathologic Description
- **There are several ill defined dark red to purple areas on the wattles and the comb. The bird is also open-mouth breathing, indicating respiratory distress.**

avian influenza

- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. This bird is open-mouth breathing, a sign of dyspnea. Although respiratory signs are generally less pronounced in HPNAI versus LPNAI, signs will vary with the extent of tracheal involvement and mucous accumulation. Birds that survive 3-7 days, as seen here, may also exhibit nervous sings. This bird is unable to stand and is demonstrating an abnormal posture of standing on its hocks.**

avian influenza

- Clinical Description
- **This image was taken 2 days post experimental inoculation with highly pathogenic avian influenza. Birds that survive the acute stages of AI may develop nervous disorders. This bird is unable to clasp its claws around the examinerâ€™s finger. This abnormal response to the perching reflex is a sign of nervous system dysfunction.**

avian influenza

- Morphologic Diagnosis
- **Distal limb: Marked acute edema and mild locally extensive hemorrhage**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. Swelling of the foot pads, a common finding, is due to subcutaneous edema.**
- Pathologic Description
- **The metatarsal pad and the subcutaneous tissues around the proximal phalangyeal joints is swollen. There is slight reddening of the skin on the distal tarsometatarsus.**

avian influenza

- Morphologic Diagnosis
- **Leg (subcutaneous tissue) (upper bird): Severe diffuse acute hemorrhage. Leg (subcutaneous tissue) (lower bird): Moderate acute locally extensive hemorrhage.**
- Clinical Description
- **This image was taken 4 days post experimental inoculation with highly pathogenic avian influenza. A comparison of 2 birds with HPAI showing the different degree of hemorrhages on the shanks.**
- Pathologic Description
- **These two legs are from two different birds. The lower leg shows a large area of hemorrhage over the intertarsal joint. In the upper leg, there is more extensive hemorrhage over the intertarsal joint, the skin overlying the tarsometatarsus, and digital and metatarsal pad.**

avian influenza

- Morphologic Diagnosis
- **Skin (comb, wattles): Severe acute edema and hemorrhage. Skin (face): Severe edema. Skin: Dehydration.**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. There is bilateral edema on both sides of the face. Edema of the face is easiest to appreciate by observing the bird head-on. Squaring of the head over the eye region, is associated with periorbital edema and is a common clinical sign observed in HPAI.**
- Pathologic Description
- **The subcutanous tissue of the comb, wattles and face is extremely swollen. The swelling of the face gives the head a square appearance. There are large dark purple areas on both the comb and wattles. The unfeathered skin is dry and wrinkled.**

avian influenza

- Morphologic Diagnosis
- **Skin (comb, wattles): Severe acute edema and hemorrhage. Skin (face): Severe edema.**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. Detailed view of the squaring of the head over the left eye.**
- Pathologic Description
- **The subcutanous tissue of the comb, wattles and face is extremely swollen. The swelling of the face gives the head a square appearance. There are large dark purple areas on both the comb and wattles.**

avian influenza

- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. There are many birds exhibiting severe depression in the cages. This bird also has severe hemorrhages on the comb and wattles.**

avian influenza

- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. The comb and wattles have extensive ecchymotic lesions with areas of cyanosis and necrosis. There is also necrotic blepharitis.**

avian influenza

- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. The conjunctivae are congested and there are hemorrhagic lesions on the mucous membranes.**

avian influenza

- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. The conjunctivae are severely congested and there are extensive hemorrhagic lesions on the mucous membranes.**

avian influenza

- Morphologic Diagnosis
- **Periocular skin: Mild edema**
- Clinical Description
- **This image was taken 2 days post experimental inoculation with highly pathogenic avian influenza. The bird was found dead in its cage. There is mild periocular edema but no other external lesions. Birds that die of peracute disease, such as this one, may not have significant gross lesions.**
- Pathologic Description
- **The subcutaneous tissue around the eye is slightly swollen.**

avian influenza

- Morphologic Diagnosis
- **Face: Mild unilateral edema. Wattles and comb: Mild edema.**
- Clinical Description
- **This image was taken 2 days post experimental inoculation with highly pathogenic avian influenza. There is unilateral edema on the left side of the birdâ€™s face. Edema of the face is easiest to appreciate by observing the bird head-on. Squaring of the head over the eye region, is associated with periorbital edema and is a common clinical sign observed in HPAI.**
- Pathologic Description
- **The comb and wattles are slightly swollen and the left side of the face bulges slightly outward.**

avian influenza

- Morphologic Diagnosis
- **Wattle and skin: Severe acute focal ecchymosis with edema and congestion.**
- Clinical Description
- **This image was taken 2 days post experimental inoculation with highly pathogenic avian influenza. On this detailed view of the wattle, congestion and a severe ecchymotic lesion can be observed.**
- Pathologic Description
- **The wattle is swollen and the the skin is reddened. There is a large, well demarcated, irregularly shaped dark red area on this skin at the junction of the wattle and the neck (ecchymosis.(**

avian influenza

- Morphologic Diagnosis
- **Subcutaneous tissue: Acute edema. Infraorbital sinus: Acute hemorrhage**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. This photo shows a subcutaneous accumulation of serous exudate consistent with periocular edema. There are also hemorrhagic lesions in the infraorbital sinus.**
- Pathologic Description
- **The skin on the lateral head has been reflected cranially to reveal the underlying tissues. The subcutaneous tissues are slightly wet and glistening and the periocular tissue (especially along the dorsal borders) is expanded, glistening, and slightly yellow. The infraorbital sinus contains blood.**

avian influenza

- Morphologic Diagnosis
- **Subcutaneous tissue: Acute edema. Comb: Acute hemorrhage and edema.**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. This photo shows a subcutaneous accumulation of serous exudate consistent with severe periocular edema.**
- Pathologic Description
- **The skin overlying the face has been reflected to reveal the underlying tissues. The subcutaneous tissue is diffusely wet and glistening. The subcutaneous tissue along the ventral face is particularly affected. It is swollen, pale, wet and gelatinous and slightly yellow. A similar change can be seen in the subcutaneous tissue dorsal to the eye where the skin has been pulled taught. The comb is mottle dark purple and red and is slightly swollen.**

avian influenza

- Morphologic Diagnosis
- **Skin (comb, wattles): Severe acute edema and hemorrhage Skin (face): Severe edema.**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza.**
- Pathologic Description
- **The subcutanous tissue of the comb, wattles and face is extremely swollen. The swelling of the face gives the head a square appearance. There are large dark purple areas on both the comb and wattles.**

avian influenza

- Morphologic Diagnosis
- **Comb: Severe acute edema and hemorrhage**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. This incision through the comb shows how subcutaneous edema results in swelling of the tissues of the comb and wattles.**
- Pathologic Description
- **The skin of the comb has been incised. The surface of the comb is covered by irregular red areas and the entire comb is swollen. The incised tissue is thickened, wet and gelatinous.**

avian influenza

- Morphologic Diagnosis
- **Comb: Severe acute edema and hemorrhage**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. This incision through the comb shows how subcutaneous edema results in swelling of the tissues of the comb and wattles.**
- Pathologic Description
- **The skin of the comb has been incised. The surface of the comb is covered by irregular red areas and the entire comb is swollen. The incised tissue is thickened, wet and gelatinous.**

avian influenza

- Morphologic Diagnosis
- **Wattle: Severe acute edema. Comb: Acute hemorrhage**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. This incision through the wattle shows how subcutaneous edema results in swelling of the tissues of the comb and wattles.**
- Pathologic Description
- **The wattle is markedly swollen and the skin has been incised to reveal the markedly wet, glistening, gelatinous, yellow tinged subcutaneous tissue. Additionally, the comb is dry, and mottled dark purple and red.**

avian influenza

- Morphologic Diagnosis
- **Subcutaneous tissue (ventral neck and head): Severe acute diffuse edema. Subcutaneous tissue (wattles): Moderate acute multifocal hemorrhage.**
- Clinical Description
- **This image was taken 4 days post experimental inoculation with highly pathogenic avian influenza. There is a severe accumulation of serous exudate in the wattles and intermandibular space. In HPAI, edema tends to be most pronounced in the face and neck regions.**
- Pathologic Description
- **The skin on the ventral neck and intramandibular space has been opened to reveal the subcutaneous structures. The subcutaneous tissues are gelatinous and expanded by clear, yellow tinged fluid. The edges of the wattles can be seen on the edges of the reflected skin. These tissues contain numerous, bright red hemorrhages.**

avian influenza

- Morphologic Diagnosis
- **Skin (feet and legs): Marked acute multifocal hemorrhage and edema**
- Clinical Description
- **This image was taken 4 days post experimental inoculation with highly pathogenic avian influenza.**
- Pathologic Description
- **The subcutaneous tissue of the legs, feet and toes is mottled dark red to purple. Additionally, the feet are swollen.**

avian influenza

- Morphologic Diagnosis
- **Leg (subcutaneous tissue) (left): Severe acute diffuse hemorrhage .Leg (subcutaneous tissue) (right): Mild edema**
- Clinical Description
- **This image was taken 4 days post experimental inoculation with highly pathogenic avian influenza. A comparison of 2 birds with HPAI showing the different degree of edema and hemorrhages on the shanks and feet.**
- Pathologic Description
- **These two legs are from two different birds. The right leg leg shows minimal swelling of the foot. In the left leg, there is more extensive hemorrhage over the intertarsal joint, the skin overlying the tarsometatarsus, digital and metatarsal pad.**

avian influenza

- Morphologic Diagnosis
- **Legs (subcutaneous tissue): Severe acute multifocal to coalescing hemorrhage and edema**
- Clinical Description
- **This image was taken 4 days post experimental inoculation with highly pathogenic avian influenza.**
- Pathologic Description
- **The subcutaneous tissues of the lower legs and feet are discolored by variably sized, coalescing, red to purple foci. The entire limb is swollen.**

avian influenza

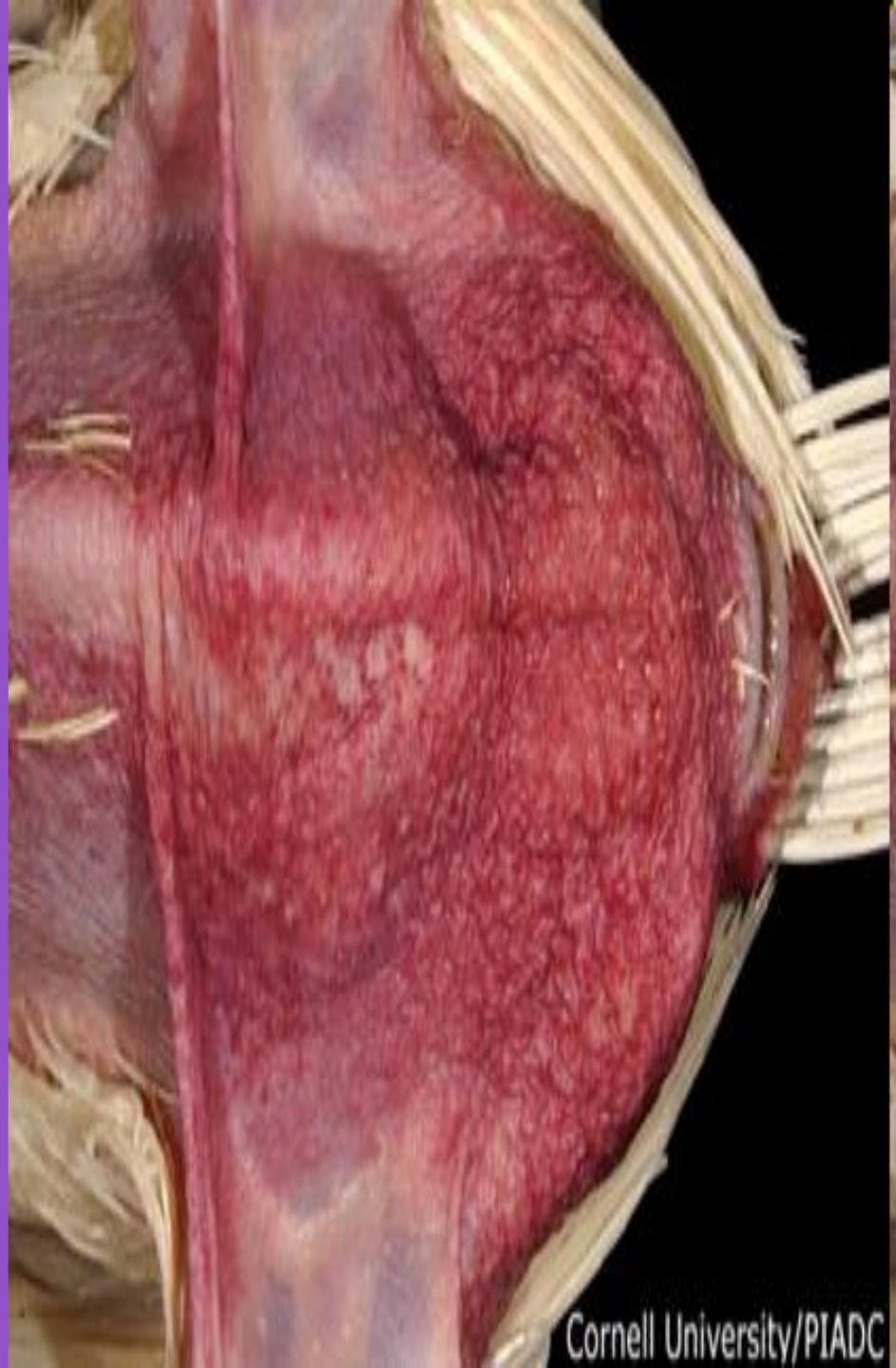
- Morphologic Diagnosis
- **Subcutaneous and periarticular tissue: Acute edema and congestion.**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. An incision has been made over the swollen hock joint, revealing a subcutaneous accumulation of serohemorrhagic exudate, consistent with edema.**
- Pathologic Description
- **The skin overlying the swollen joint has been peeled back to reveal the subcutaneous tissue and portions of the joint capsule. The tissue is slightly wet, and the blood vessels are prominent. Near the left side of the photo, there is a short linear incision into the joint capsule and the tendon attachment. This incision reveals the accumulation of a small amount of yellow tinged fluid in the tissue.**

avian influenza

- Morphologic Diagnosis
- **Subcutaneous tissue (leg): Marked acute diffuse edema**
- Clinical Description
- **This image was taken 5 days post experimental inoculation with highly pathogenic avian influenza. An incision was made to expose the accumulation of subcutaneous edema over the hock joint.**
- Pathologic Description
- **The subcutaneous tissue is markedly expanded, pale, wet and glistening.**

avian influenza

- Morphologic Diagnosis
- **Skin (ventral abdomen): Severe acute diffuse hemorrhage**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. Although hemorrhagic lesions typically target nonfeathered skin, here severe cutaneous hemorrhages are observed on the ventral abdomen.**
- Pathologic Description
- **The skin of the ventral abdomen is diffusely bright red.**



avian influenza

- Morphologic Diagnosis
- **Subcutaneous tissue (ventral body): Moderate acute locally extensive edema**
- Clinical Description
- **This image was taken 4 days post experimental inoculation with highly pathogenic avian influenza.**
- Pathologic Description
- **The skin and subcutaneous tissue have been reflected caudally off of the keel and pectoral muscles. The subcutaneous tissue is gelatinous, shiny, wet and expanded by accumulation of clear, yellow tinged fluid.**

avian influenza

- Morphologic Diagnosis
- **Subcutaneous tissue (ventral body): Moderate acute diffuse edema. Pectoral muscle and fat: Mild multifocal acute hemorrhages.**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. Detailed view of the subcutaneous edema over the keel and hemorrhages within the pectoral muscles.**
- Pathologic Description
- **The skin overlying the keel has been reflected caudally to reveal that the subcutaneous tissues overlying the keel are a wet, gelatinous and expanded by clear, yellow fluid. Additionally, there are multiple, variably sized, poorly demarcated dark red foci within the pectoral muscles and in the fat overlying the keel.**

avian influenza

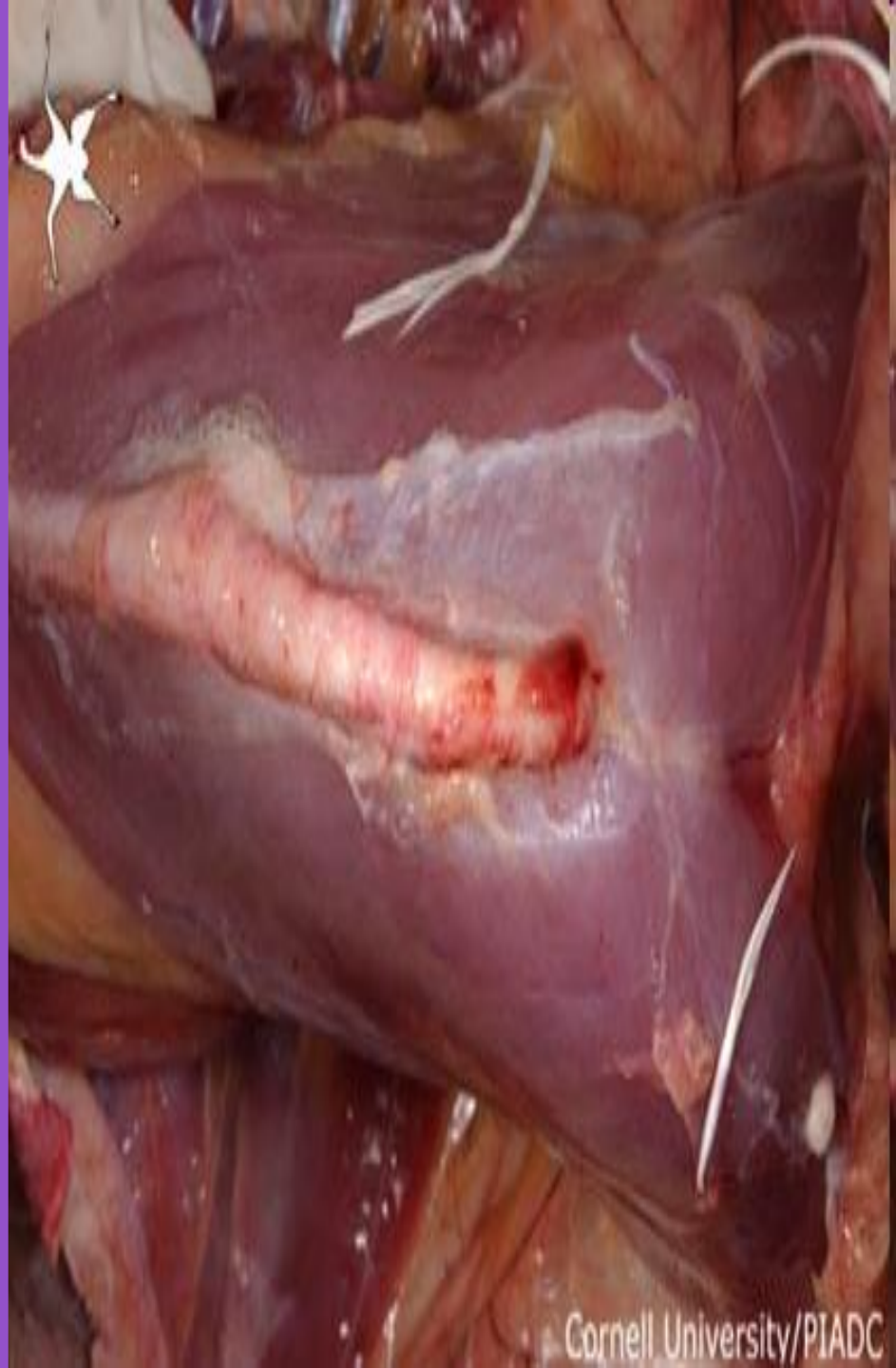
- Morphologic Diagnosis
- **Adipose tissue (thoracic inlet): Severe acute focal hemorrhage**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. There are subcutaneous hemorrhages in the fat over the breast region.**
- Pathologic Description
- **The fat within the thoracic inlet contains a large, irregularly shaped, dark red area.**

avian influenza

- Morphologic Diagnosis
- **Subcutaneous tissue (keel): Moderate acute diffuse edema with multifocal hemorrhage**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. Subcutaneous hemorrhages and edema can be observed over the keel region.**
- Pathologic Description
- **The subcutaneous connective tissue overlying the keel is wet, gelatinous and contains numerous, bright red foci.**

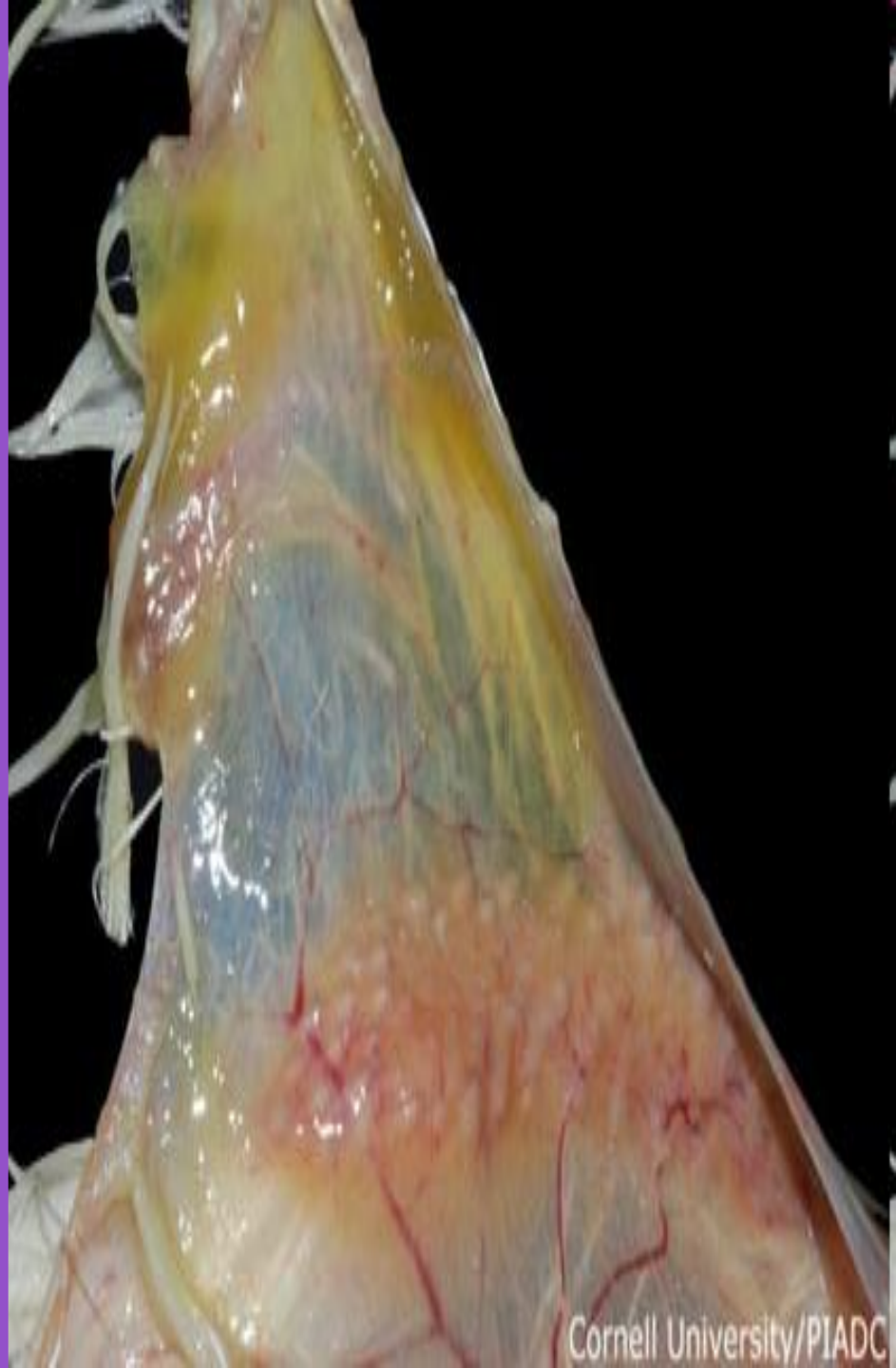
avian influenza

- Morphologic Diagnosis
- **Subcutaneous tissue (ventral keel): Mild acute multifocal hemorrhage and edema**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. There are mild subcutaneous hemorrhages and edema along the keel bone.**
- Pathologic Description
- **The fat and connective tissues covering the keel contain numerous, variably sized red foci. The tissue is slightly wet and glistening.**



avian influenza

- Morphologic Diagnosis
- **Subcutaneous tissue: Marked acute edema**
- Clinical Description
- **This image was taken 5 days post experimental inoculation with highly pathogenic avian influenza.**
- Pathologic Description
- **The subcutaneous fat and tissues are wet and gelatinous and expanded by slightly yellow, gelatinous material.**



avian influenza

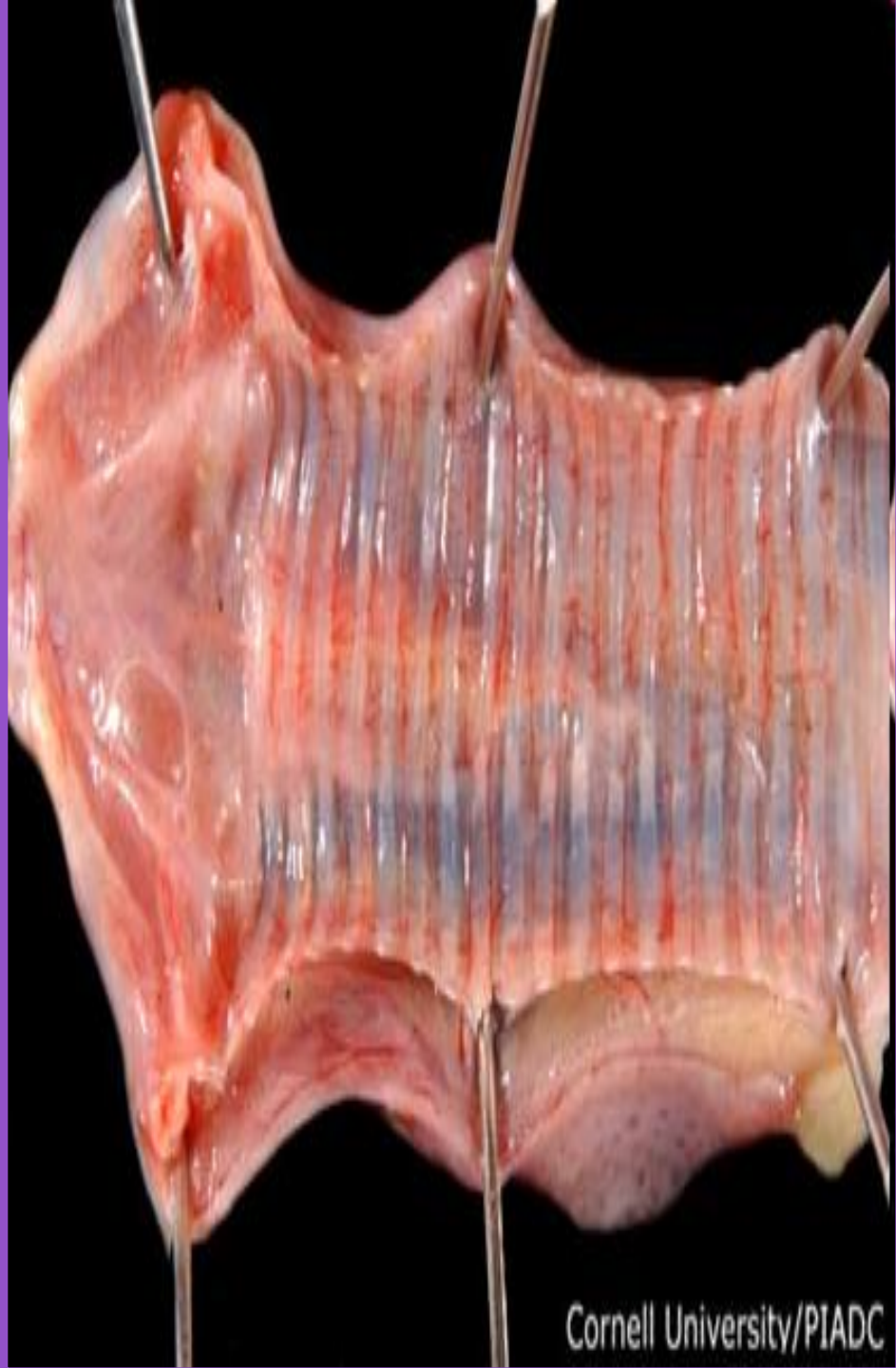
- Morphologic Diagnosis
- **Trachea: Diffuse hemorrhage and congestion**
- Clinical Description
- **This image was taken 2 days post experimental inoculation with highly pathogenic avian influenza. In HPAI, hemorrhagic tracheitis may be severe enough to be visible on the outer surface of the trachea.**
- Pathologic Description
- **The blood vessels on the adventitial surface of the trachea are congested and prominent. They are evident running parallel to the tracheal rings. The trachea is diffusely red and irregular red to purple foci can be seen throughout the tracheal wall.**

avian influenza

- Morphologic Diagnosis
- **Trachea: Severe tracheitis with hemorrhage**
- Clinical Description
- **This image was taken 4 days post experimental inoculation with highly pathogenic avian influenza. As seen here, hemorrhagic laryngotracheitis can become quite severe.**
- Pathologic Description
- **This is a closed segment of trachea with larynx (right side of image). The dark red mucosa can be seen through the adventitia of the trachea and the dark color of the proximal trachea suggests the presence of luminal exudate.**

avian influenza

- Morphologic Diagnosis
- **Tracheal mucosa: Mild congestion**
- Clinical Description
- **This image was taken 2 days post experimental inoculation with highly pathogenic avian influenza. The range of tracheal lesions observed may vary greatly from mucous accumulation to severe hemorrhagic tracheitis. Here, mild congestion of the tracheal mucosa can be observed.**
- Pathologic Description
- **The trachea has been opened to reveal the mucosal surface. The blood vessels are prominent and congested.**



avian influenza

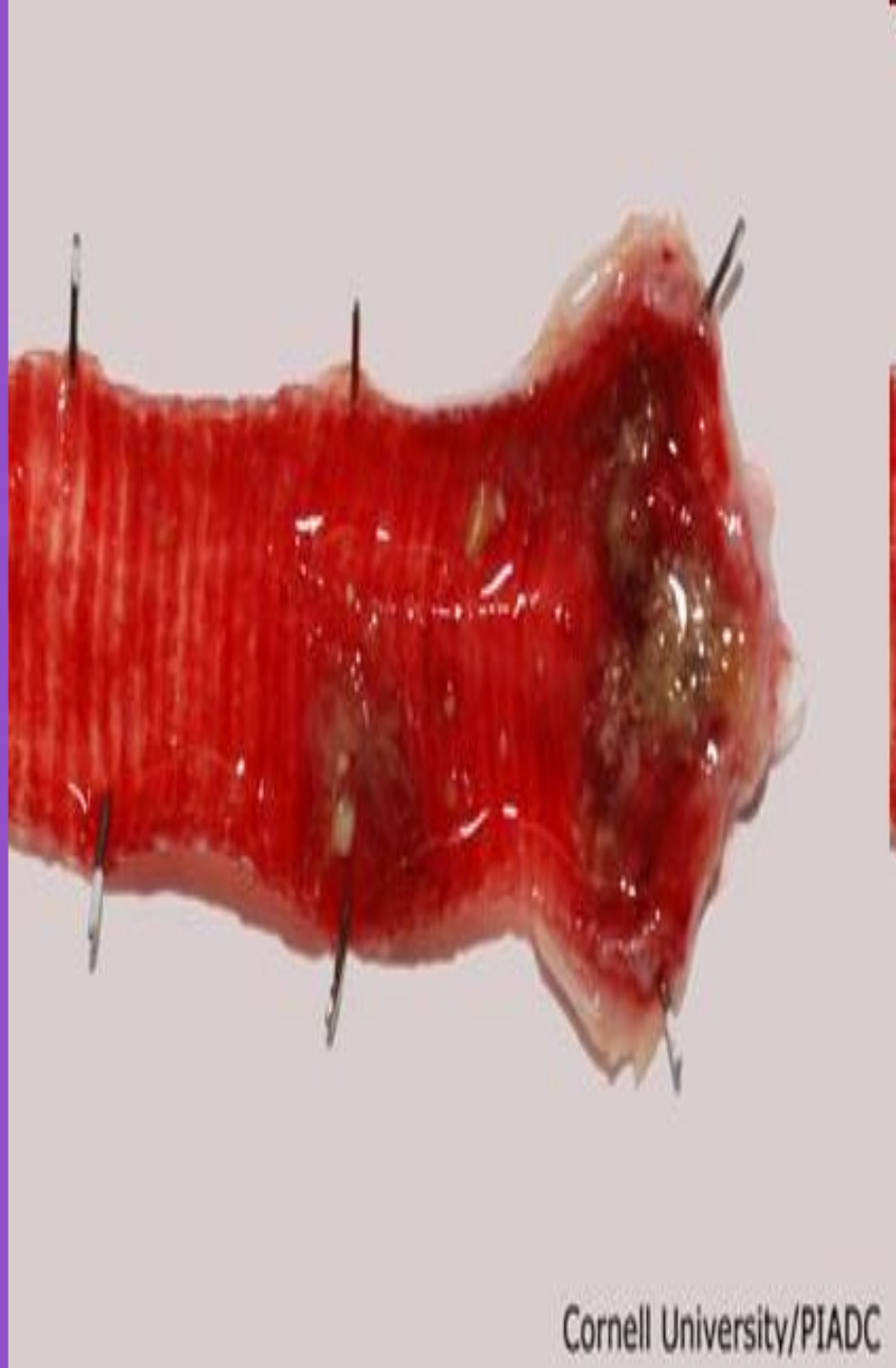
- Morphologic Diagnosis
- **Trachea: Mild cattarhal tracheitis with petechia**
- Clinical Description
- **This image was taken 4 days post experimental inoculation with highly pathogenic avian influenza virus. There is mucopurulent catarrhal exudate in the lumen of the trachea.**
- Pathologic Description
- **The mucosal surface of the trachea is stippled by numerous pinpoint red foci and the lumen contains increased amounts of mucus.**

avian influenza

- Morphologic Diagnosis
- **Trachea: Acute multifocal petechia**
- Clinical Description
- **In chickens infected with highly pathogenic avian influenza, lesions distributed throughout the upper respiratory tract are common. Tracheal findings can range from normal to severe. In this image of the tracheal mucosa, there is severe edema, congestion, and hemorrhage.**
- Pathologic Description
- **The trachea has been opened to reveal the mucosal surface. The mucosa is stippled with numerous, small, red, punctate hemorrhages.**

avian influenza

- Morphologic Diagnosis
- **Trachea: Severe acute catarrhal tracheitis with hemorrhage**
- Clinical Description
- **This image was taken 4 days post experimental inoculation with highly pathogenic avian influenza. Mucus accumulation is variable and, when pronounced, can lead to respiratory distress.**
- Pathologic Description
- **The mucosal surface of the trachea is bright red with several ill defined darker foci. The lumen of the trachea contains increased amounts of mucus.**



avian influenza

- Morphologic Diagnosis
- **Trachea: Severe acute cattarhal tracheitis with hemorrhage**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. In HPAI, the upper respiratory tract may have catarrhal lesions including fibrinous, serofibrinous, mucopurulent (seen here), or fibrinopurulent exudates.**
- Pathologic Description
- **The mucosa of the trachea is dark red and there are numerous coalescing dark red areas throughout the wall. The tracheal lumen is filled with increased amounts of mucus.**

avian influenza

- Morphologic Diagnosis
- **Trachea: Severe acute diffuse mucosal hemorrhage**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. There is severe diffuse hemorrhagic tracheitis.**
- Pathologic Description
- **The trachea has been opened to reveal the dark red color to the mucosa.**

avian influenza

- Morphologic Diagnosis
- **Trachea: Acute diffuse mucosal hemorrhage. Thymus: Moderate atrophy.**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. There is severe diffuse hemorrhagic tracheitis which can be seen from the outer surface of the trachea. The thymus, adjacent to the trachea, also shows moderate atrophy in this 16 week old chicken.**
- Pathologic Description
- **This image shows a dissection of the neck. The trachea runs horizontally along the bottom of the picture. Immediately above the trachea is a thymic lobule. The trachea is closed, however the extensive reddening of the mucosa can be seen through the wall. Additionally, given the age of the chicken (16 weeks), the amount of thymic tissue is decreased.**

avian influenza

- Morphologic Diagnosis
- **Coelomic cavity: Moderate acute multifocal petechiae. Coelomic cavity: Fibrinous coelomitis (presumed secondary to chronic egg-yolk peritonitis(**
- Clinical Description
- **This image was taken 2 days post experimental inoculation with highly pathogenic avian influenza. In HPAI, pinpoint petechial lesions are common in the abdominal fat and on the serosal surfaces of organs such as the intestines, seen here.**
- Pathologic Description
- **The serosal surfaces of the intestinal loops and the mesenteric fat are stippled by numerous, pinpoint red foci. Portions of the intestines on the left-hand side of the picture are coated by strands of yellow, friable material.**

avian influenza

- Morphologic Diagnosis
- **Coelomic cavity: Moderate acute multifocal petechia. Coelomic cavity: Fibrinous coelomitis (presumed secondary to unrelated egg-yolk peritonitis(**
- Clinical Description
- **This image was taken 2 days post experimental inoculation with highly pathogenic avian influenza. In HPAI, pinpoint petechial lesions are common on the serosal surfaces of organs such as the intestines, seen here.**
- Pathologic Description
- **The serosal surfaces of the intestinal loops and the mesenteric fat are stippled by numerous, pinpoint red foci and portions of the intestines are coated by strands of yellow, friable material.**

avian influenza

- Morphologic Diagnosis
- **Coelomic cavity: Moderate acute multifocal petechiae. Coelomic cavity: Fibrinous ceolomitis (presumed secondary to egg-yolk peritonitis(**
- Clinical Description
- **This image was taken 2 days post experimental inoculation with highly pathogenic avian influenza. The yellow proteinaceous material on the surface of the intestine is caused by chronic egg-yolk peritonitis. Birds that survive an AI infection longer than 7-10 days, may develop egg-yolk peritonitis as a result of ruptured ova. In this individual, the peritonitis is an unrelated finding, as this bird was only infected with AI for 2 days. Nevertheless, peritonitis associated with HPAI would have a similar appearance.**
- Pathologic Description
- **The serosal surfaces of the intestinal loops and the mesenteric fat are stippled by numerous, pinpoint red foci and portions of the intestines are coated by strands of yellow, friable material.**

avian influenza

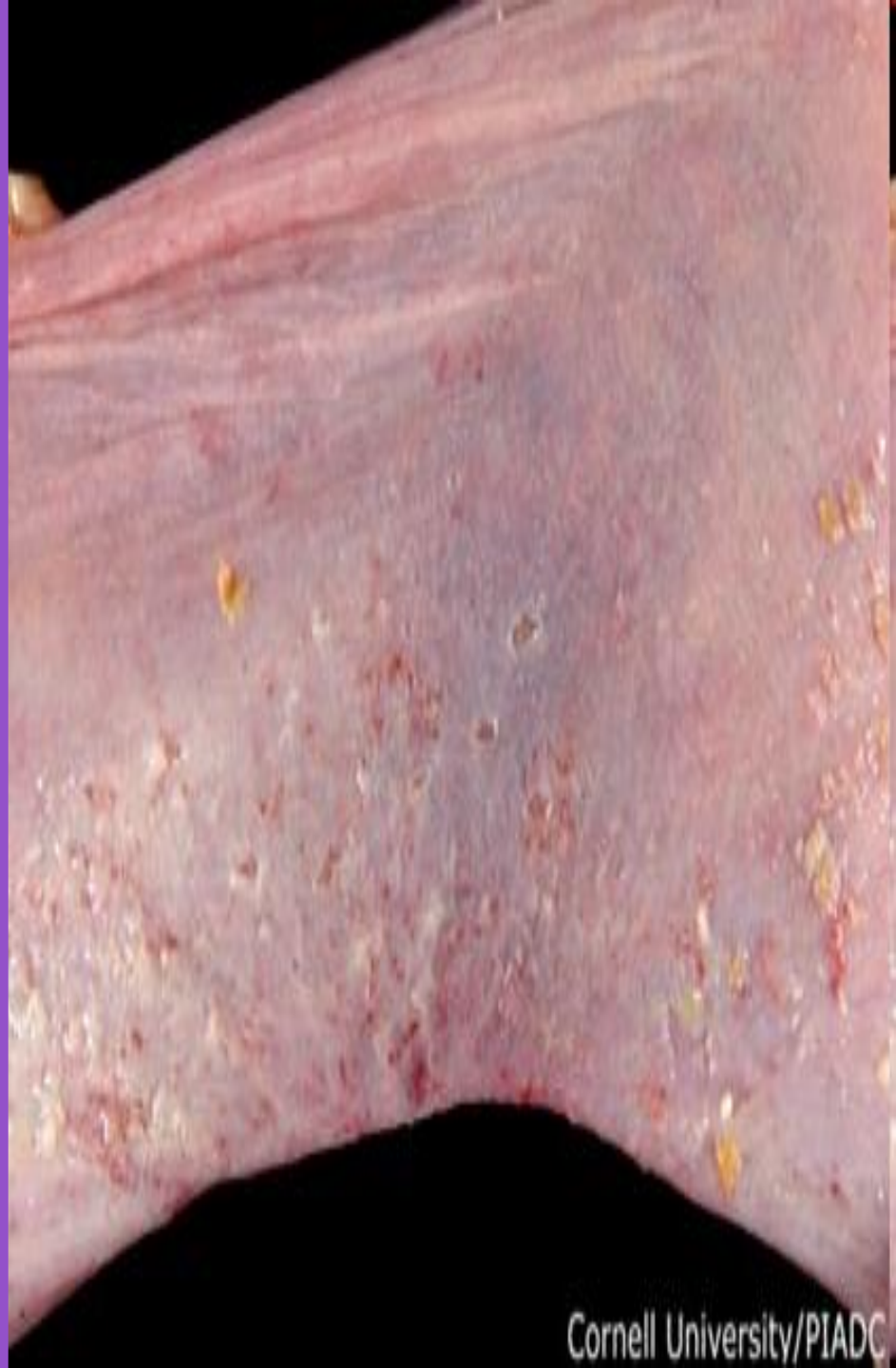
- Morphologic Diagnosis
- **Coelomic fat: Mild acute multifocal petechiation**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. In HPAI, many small petechiae will often cover the abdominal fat and serosal surfaces of many organs, as with the surface of this proventriculus.**
- Pathologic Description
- **The adipose tissue surrounding the coelomic organs is covered by numerous distinct pinpoint red foci.**

avian influenza

- Morphologic Diagnosis
- **Crop (adventitia): Moderate acute multifocal hemorrhage**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. The crop (ingluvies), part of the gastrointestinal tract, is also susceptible to HPAI lesions.**
- Pathologic Description
- **The adventitial surface of the crop is covered by numerous, well demarcated, red to purple foci.**

avian influenza

- Morphologic Diagnosis
- **Crop: Multiple acute erosions with mild multifocal acute hemorrhage**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. Detailed view of the mucosa of the crop showing characteristic erosions and hemorrhages.**
- Pathologic Description
- **The crop has been opened and the mucosal surface contains multiple, well demarcated, slightly sunken defects as well as small, sometimes coalescing red lesions.**



avian influenza

- Morphologic Diagnosis
- **Pancreas: Mild acute multifocal hemorrhage with diffuse edema**
- Clinical Description
- **This image was taken 5 days post experimental inoculation with highly pathogenic avian influenza. An enlarged firm pancreas is occasionally observed in HPAI. Hemorrhagic lesions may be commonly observed on the pancreas, as in many other organs.**
- Pathologic Description
- **The pancreas is swollen and bulges from its position between the loops of the duodenum. There are individual punctate, sometimes coalescing, red foci throughout the pancreatic parenchyma. These foci are particularly prominent near the edges of the pancreas, adjacent to the duodenum.**

avian influenza

- Morphologic Diagnosis
- **Pancreas: Acute multifocal to coalescing hemorrhage**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. There are extensive petechiae on the pancreas.**
- Pathologic Description
- **The surface of the pancreas is covered by numerous pinpoint red foci which coalesce to form multiple, larger, poorly defined red plaques.**

avian influenza

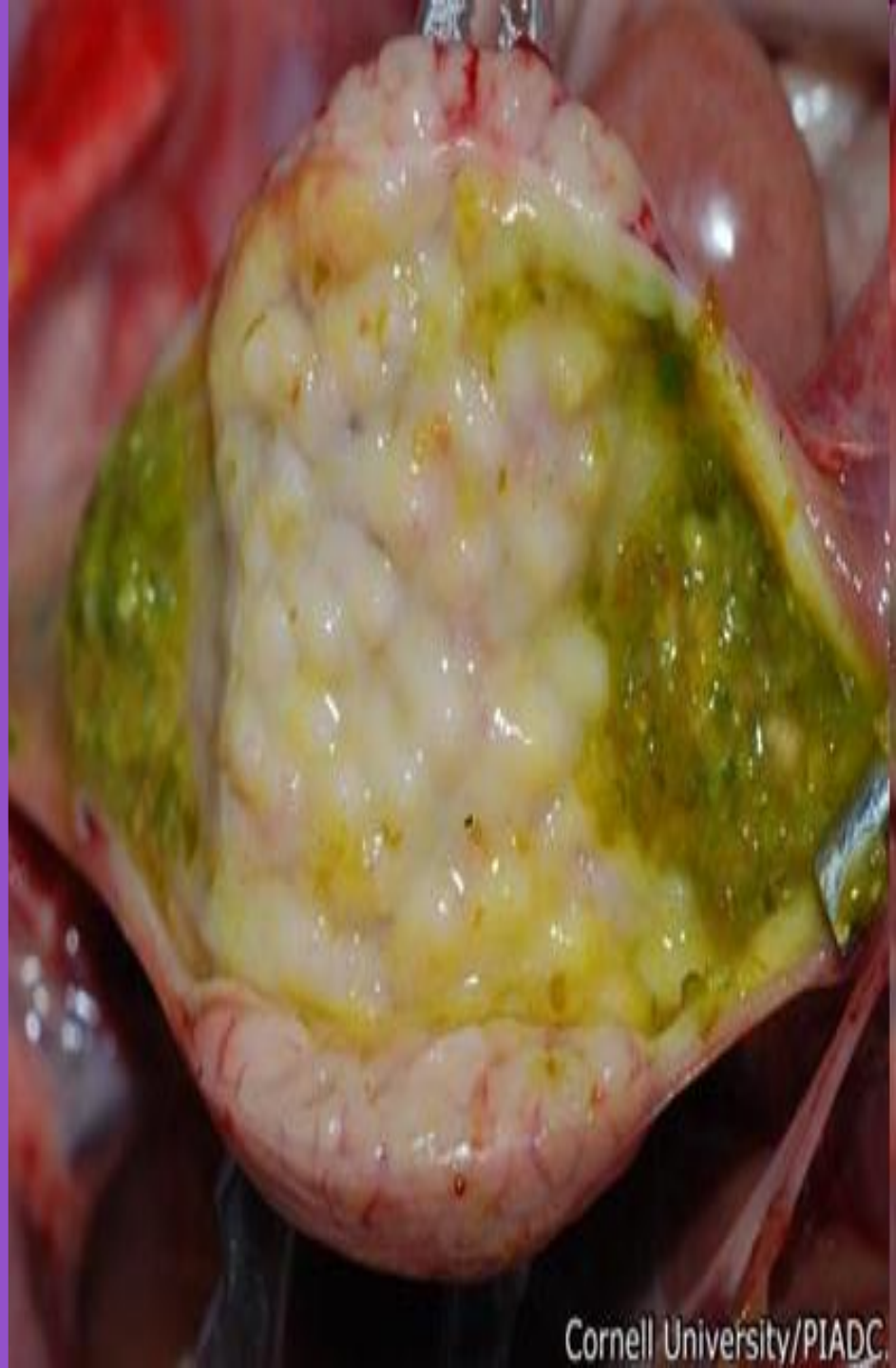
- Morphologic Diagnosis
- **Proventriculus (serosa): Marked acute multifocal hemorrhage. Intercostal spaces: Mild acute multifocal hemorrhage.**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. These serosal hemorrhages on the surface of the proventriculus, are typical of HPAI. The virus causes extensive hemorrhagic lesions across many visceral organs as a result of widespread viral replication and necrosis of endothelial cells.**
- Pathologic Description
- **The serosal surface of the proventriculus is covered by numerous, variably-shaped, coalescing, bright red areas. Similar foci can be seen in the intercostal spaces, present at the bottom of the photograph.**

avian influenza

- Morphologic Diagnosis
- **Proventriculus, ventriculus: Multifocal acute hemorrhages and diffuse edema**
- Clinical Description
- **This image was taken 2 days post experimental inoculation with highly pathogenic avian influenza. In HPAI, the glands of the proventriculus may have hemorrhagic lesions. As observed here, these hemorrhages tend to be concentrated at the junction between the proventriculus and the gizzard (ventriculus.(**
- Pathologic Description
- **The mucosal surface and wall of the proventriculus is wet and glistening. Small pinpoint red foci are present within the proventricular glands. These hemorrhages are most dense at the junction of the proventriculus and the ventriculus (lower left of photo). A portion of the ventricular koilin has been peeled back (bottom center) to reveal hemorrhages in the subadjacent mucosa. Reddening of the mucosa at the esophageal/proventricular interface is also prominent.**

avian influenza

- Morphologic Diagnosis
- **Proventriculus: Mild acute multifocal hemorrhage and edema**
- Clinical Description
- **This image was taken 4 days post experimental inoculation with highly pathogenic avian influenza. After 4 days, there is still only mild inflammation and petechiation in this birdâ€™s proventriculus. This illustrates that within a flock, the distribution and severity of lesions for HPAI, will vary from bird to bird.**
- Pathologic Description
- **The proventriculus has been opened to reveal the mucosal surface. There are rare small petechia over the mucosa and the wall of the organ is slightly thickened. Mural and serosal blood vessels are congested.**



avian influenza

- Morphologic Diagnosis
- **Proventriculus: Mild acute multifocal hemorrhage. Spleen: Multifocal acute necrosis**
- Clinical Description
- **This image was taken 2 days post experimental inoculation with highly pathogenic avian influenza. With most strains of HPAI, as seen here, necrotic foci will frequently be observed on the surface of the spleen. The glands of the proventriculus may also have hemorrhagic lesions. As observed here, these hemorrhages tend to be concentrated at the junction between the proventriculus and the gizzard (ventriculus.(**
- Pathologic Description
- **The mucosal surface of the proventriculus is stippled by numerous pinpoint hemorrhages. The spleen is present at the top of the image. The surface is the spleen in mottled by numerous, small, sometimes coalescing white foci.**

avian influenza

- Morphologic Diagnosis
- **Proventriculus (mucosa): Moderate multifocal acute hemorrhage**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. Detailed view of the proventricular glands with hemorrhagic lesions.**
- Pathologic Description
- **The tips of the proventricular glands are bright red.**

avian influenza

- Morphologic Diagnosis
- **Proventriculus and gizzard (ventriculus): Moderate acute multifocal hemorrhage**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. Often the lining of gizzard (ventriculus) will peel off easily, revealing underlying ulcers and erosions.**
- Pathologic Description
- **The proventriculus (top) and gizzard (ventriculus) (bottom) have been opened and the koilin has been peeled away from the ventriculus to reveal the underlying mucosa. There are numerous, small red foci scattered over the proventricular glands and there are larger areas of similar hemorrhages on the ventricular mucosa.**

avian influenza

- Morphologic Diagnosis
- **Proventriculus (mucosa): Moderate multifocal acute hemorrhage**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. The proventricular glands have extensive hemorrhagic lesions, typical of HPAI. In HPAI the koilin, which lines the mucosal surface of the gizzard (ventriculus) peels away easily and, as seen here, hemorrhages in the underlying mucosa may be observed. Additionally, erosions and ulcers may also be observed.**
- Pathologic Description
- **The tips of the proventricular glands are bright red.**

avian influenza

- Morphologic Diagnosis
- **Lung: Acute multifocal hemorrhage with edema and congestion**
- Clinical Description
- **This image was taken 2 days post experimental inoculation with highly pathogenic avian influenza. In HPAI, as seen here, the lungs may appear deep red in color due to congestion and hemorrhages. They may also exude fluid when cut due to to the presence of edema.**
- Pathologic Description
- **There are several, irregularly shaped red foci in the lungs. The entire pulmonary parenchyma is wet and glistening with some areas of reddening. The blood vessels are prominent.**

avian influenza

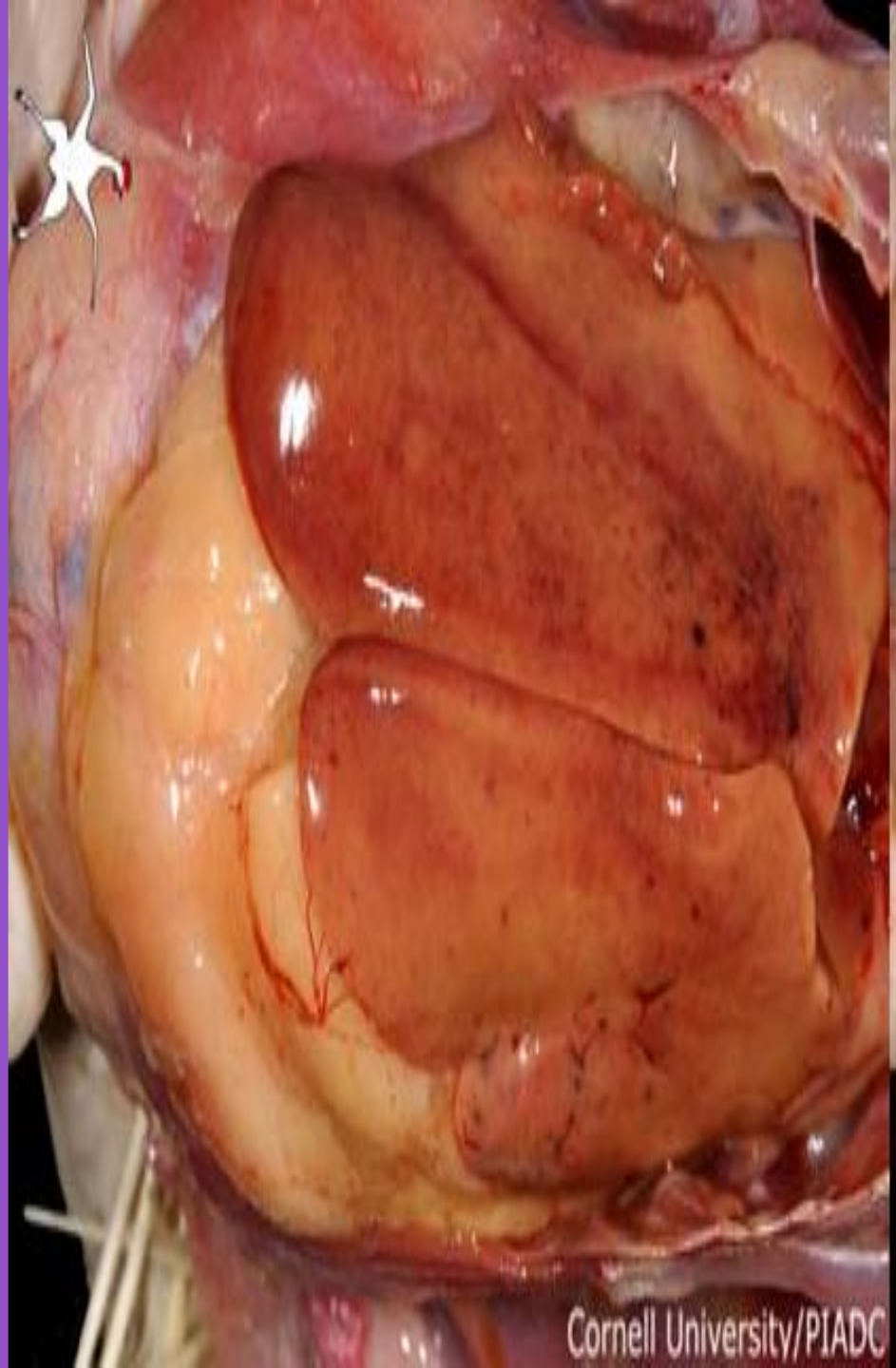
- Morphologic Diagnosis
- **Lung: Acute multifocal hemorrhage with edema and congestion**
- Clinical Description
- **This image was taken 2 days post experimental inoculation with highly pathogenic avian influenza. As commonly observed in HPAI, the lungs are swollen, due to edema, congested, and there are extensive hemorrhages throughout the lungs.**
- Pathologic Description
- **There are several, irregularly shaped red foci in the lungs. The entire pulmonary parenchyma is wet and glistening with some areas of reddening. The blood vessels and intralobular spaces are prominent.**

avian influenza

- Morphologic Diagnosis
- **Lung: Acute multifocal hemorrhage with edema and congestion**
- Clinical Description
- **This image was taken 2 days post experimental inoculation with highly pathogenic avian influenza. In HPAI the lungs, as seen here, are often congested, edematous, and hemorrhagic. The lungs may also have focal ventral to diffuse interstitial pneumonia.**
- Pathologic Description
- **There are several, irregularly shaped red foci in the lungs. The entire pulmonary parenchyma is wet and glistening with some areas of reddening.**

avian influenza

- Morphologic Diagnosis
- **Liver: Moderate acute diffuse hemorrhage with diffuse hepatopathy**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. In HPAI, liver lesions may include hepatomegaly as well as hemorrhages and necrosis.**
- Pathologic Description
- **The capsular surface of the liver contains numerous, variably sized dark red to purple foci. The liver is swollen with blunted edges and is diffusely pale.**



avian influenza

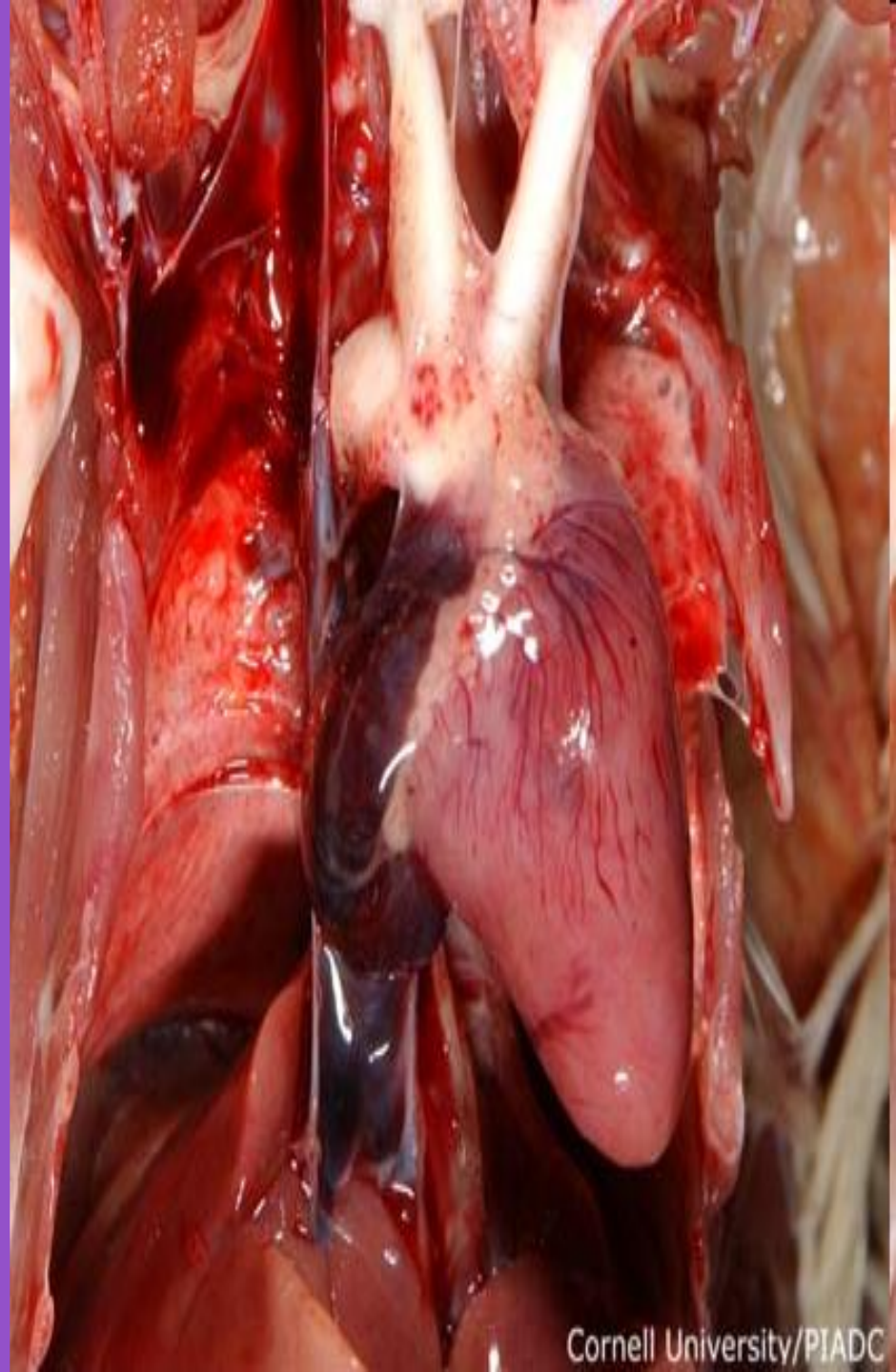
- Morphologic Diagnosis
- **Liver: Moderate acute multifocal hemorrhage**
- Clinical Description
- **This image was taken 2 days post experimental inoculation with highly pathogenic avian influenza. In HPAI, it is common to find hemorrhagic lesions distributed throughout visceral organs. Here, hemorrhages on found on the surface of the liver. Occasionally, the liver may also have necrotic foci.**
- Pathologic Description
- **The surface of the liver is mottled by multiple, variably sized, sometimes coalescing red foci.**

avian influenza

- Morphologic Diagnosis
- **Liver: Multifocal acute necrosis with hemorrhage**
- Clinical Description
- **This image was taken 2 days post experimental inoculation with highly pathogenic avian influenza. In HPAI, it is common to find hemorrhagic lesions distributed throughout visceral organs. Here, hemorrhages on found on the surface of the liver. Occasionally, the liver may also have necrotic foci.**
- Pathologic Description
- **The liver is mottled by multiple, often coalescing red foci. On the right edge of the image, near the junction of the two portions of the left liver lobe, these red foci appear slightly sunken. The remaining parenchyma is slightly pale and during the examination, the tissue was observed to be friable.**

avian influenza

- Morphologic Diagnosis
- **Great vessels (adventitia): Multiple acute petechia.**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. There are petechial hemorrhages on the epicardial fat and the base of the great vessels. This is a common finding in HPAI.**
- Pathologic Description
- **The adventitial surfaces of the great vessels at the base of the heart and the epicardial fat contain numerous, pinpoint red foci. The right atrium is markedly dilated and filled with blood. This dilatation of the atrium is a common post-mortem finding in birds and is not a lesion.**



avian influenza

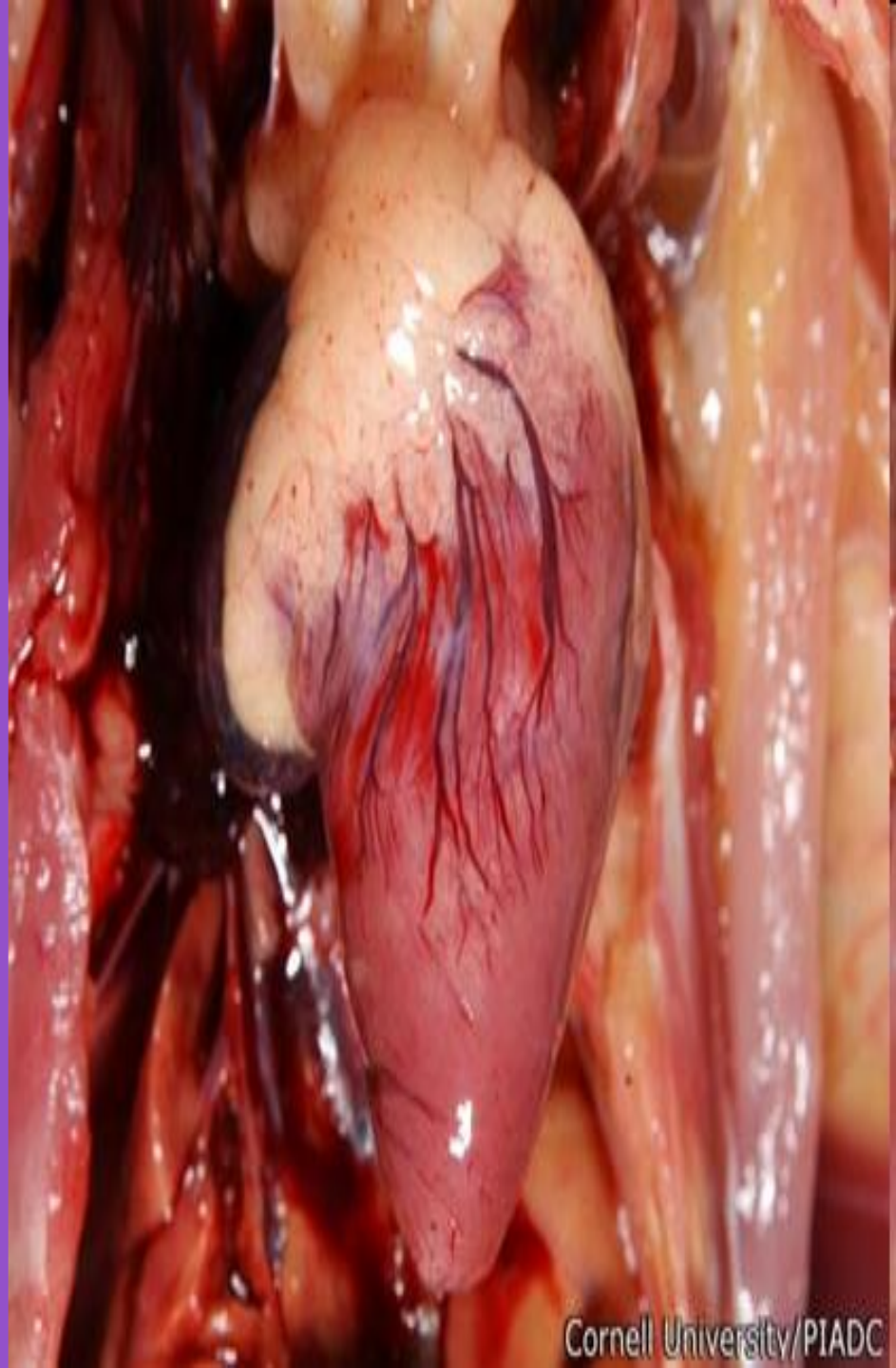
- Morphologic Diagnosis
- **Epicardial fat: Marked acute multifocal hemorrhage**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza.**
- Pathologic Description
- **The epicardial fat contains a large number of bright red, pinpoint, sometime coalescing red foci.**

avian influenza

- Morphologic Diagnosis
- **Coronary fat: Multiple acute petechia**
- Clinical Description
- **This image was taken 2 days post experimental inoculation with highly pathogenic avian influenza. Moderate petechial hemorrhages can be seen on the coronary fat. Although not observed here, hemorrhages and necrotic foci may also be prominent on the epicardium, depending on the strain of the virus.**
- Pathologic Description
- **The coronary fat of the heart is stippled by numerous, well demarcated red foci.**

avian influenza

- Morphologic Diagnosis
- **Heart (epicardium and fat): Moderate acute multifocal petechia and hemorrhage**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. As observed here, hemorrhages may also be prominent on the epicardium, depending on the strain of the virus. In some cases, necrotic foci within the epicardium may also be present.**
- Pathologic Description
- **The epicardial fat and epicardial surface of the heart are stippled by numerous pinpoint red foci. Additionally, there are larger, poorly demarcated bright red hemorrhages surrounding the congested coronary vessels.**



avian influenza

- Morphologic Diagnosis
- **Heart (epicardium and fat): Moderate acute multifocal petechia and hemorrhage**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. As observed here, hemorrhages may also be prominent on the epicardium, depending on the strain of the virus.**
- Pathologic Description
- **The epicardial fat and epicardial surface of the heart are stippled by numerous pinpoint red foci. Additionally, there are larger, poorly demarcated bright red hemorrhages surrounding the congested coronary vessels.**

avian influenza

- Morphologic Diagnosis
- **Epicardial fat: Marked acute multifocal hemorrhage**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza.**
- Pathologic Description
- **The epicardial fat contains a large number of bright red, pinpoint, sometime coalescing red foci.**

avian influenza

- Morphologic Diagnosis
- **Pericardium and adipose tissue: Multifocal acute petechiae.**
- Clinical Description
- **This image was taken 2 days post experimental inoculation with highly pathogenic avian influenza. With most strains for HPAI, as seen here, pinpoint petechial hemorrhages are frequently observed along the pericardium and abdominal fat.**
- Pathologic Description
- **The keel and rib cage have been cut and reflected cranially. The heart has remained attached to the ventral surface of the sternum and has been pulled forward as well. The apex of the heart is at the top of the image and the liver is at the bottom right. The pericardial surface and the surrounding adipose tissue is stippled with small, discrete red foci.**

avian influenza

- Morphologic Diagnosis
- **Right kidney: Moderate edema and congestion with urate retention**
- Clinical Description
- **This image was taken 2 days post experimental inoculation with highly pathogenic avian influenza. As observed here, in birds infected with HPAI, the kidneys may become swollen, congested, and plugged with white urate deposits in the renal tubules and ureters.**
- Pathologic Description
- **The right kidney (lower) is swollen with an enhanced reticular pattern. The parenchyma is covered by numerous pinpoint white, slightly granular foci (urates). The ureter, seen on the medial edge of the middle kidney lobe, is prominent due to accumulation of urates within the lumen.**

avian influenza

- Morphologic Diagnosis
- **Right kidney: Moderate edema and congestion with urate retention**
- Clinical Description
- **This image was taken 2 days post experimental inoculation with highly pathogenic avian influenza. Detailed view of kidneys. The renal lobe is enlarged due to the inflammatory and degenerative process. The white lesions are caused by the accumulation of urate crystals.**
- Pathologic Description
- **The kidney is swollen with an enhanced reticular pattern. The parenchyma is covered by numerous pinpoint white, slightly granular foci (urates) The ureter, seen on the medial edge of the middle kidney lobe, is prominent due to accumulation of urates within the lumen.**

avian influenza

- Morphologic Diagnosis
- **Kidneys: Acute diffuse edema and congestion with urate retention**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. The kidneys are hemorrhagic and bilaterally congested.**
- Pathologic Description
- **Both kidneys are swollen and wet. The vasculature in the renal parenchyma is prominant and the tissue is dark red. Within the dark red areas, paler, dilated tubes are present.**

avian influenza

- Morphologic Diagnosis
- **Ovary: Moderate multifocal follicular and intrafollicular hemorrhage and congestion. Ovary: Follicular atresia.**
- Clinical Description
- **This image was taken 2 days post experimental inoculation with highly pathogenic avian influenza. The follicles on this ovary are congested and some areas have hemorrhages. Some follicles are undergoing involution and degeneration and the ovary is inactive. These findings typically correlate with a precipitous drop in egg production among infected breeders and layers. There is also some yellow proteinaceous material on the periphery of the ovary that is consistent with an unrelated chronic egg yolk peritonitis.**
- Pathologic Description
- **The blood vessels over the ova are prominent and congested and, in some follicles, there are large, poorly demarcated red foci. The intrafollicular tissue is dark red. There are no mature ova on the ovary. Some of the follicles are becoming paler and slightly flaccid (atresia). Depending on the timing of the lay cycle, the lack of mature follicles and increased atresia can indicate disease.**

avian influenza

- Morphologic Diagnosis
- **Ovary: Acute congestion and hemorrhage with follicular atresia**
- Clinical Description
- **This image was taken 2 days post experimental inoculation with highly pathogenic avian influenza. In HPAI, ovaries such as this one, may become hemorrhagic with ova involution and degeneration.**
- Pathologic Description
- **This ovary contains follicles in numerous stages of development. The follicular vessels are congested and in some areas the follicles and intrafollicular spaces are dark red. Several of the large follicles are flaccid and some are collapsed (atresia.(**

avian influenza

- Morphologic Diagnosis
- **Ovarian follicles: Atresia and multifocal hemorrhage**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. The dark green follicle in the center of the image is undergoing atresia.**
- Pathologic Description
- **Several of the ovarian follicles are shrunken and flaccid. One of the follicles is dark green and some contain red areas.**

avian influenza

- Morphologic Diagnosis
- **Ovarian follicles: Atresia and multifocal hemorrhage. Spleen: Mild splenomegaly.**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. The hemorrhagic and atresic follicles on this ovary are typical of HPAI. An enlarged, firm spleen is occasionally observed.**
- Pathologic Description
- **Several of the ovarian follicles are shrunken and flaccid. One of the follicles is dark green and some contain red areas. The spleen is slightly enlarged with an enhanced reticular pattern.**

avian influenza

- Morphologic Diagnosis
- **Bursa of Fabricius: Moderate edema with multifocal petechia**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. The bursa of Fabricius, a lymphoid tissue, is often atrophic in HPAI infections. Although its overal size may be decreased, itâ€™s mucosa may be swollen and have hemorrhagic lesions, as seen here.**
- Pathologic Description
- **The bursa of Fabricius has been opened to reveal its internal tissue folds. The bursal folds are swollen and slightly blunt and are covered by numerous pinpoint red foci.**

avian influenza

- Morphologic Diagnosis
- **Bursa of Fabricius: Moderate acute edema**
- Clinical Description
- **This image was taken 4 days post experimental inoculation with highly pathogenic avian influenza. Bursal lesions, such as the edema shown here, are common in HPAI.**
- Pathologic Description
- **The bursa of Fabricius has been cut open along its long axis to reveal the inner folds. The bursal folds are swollen and slightly less distinct than normal and the entire organ is wet and slightly gelatinous.**

avian influenza

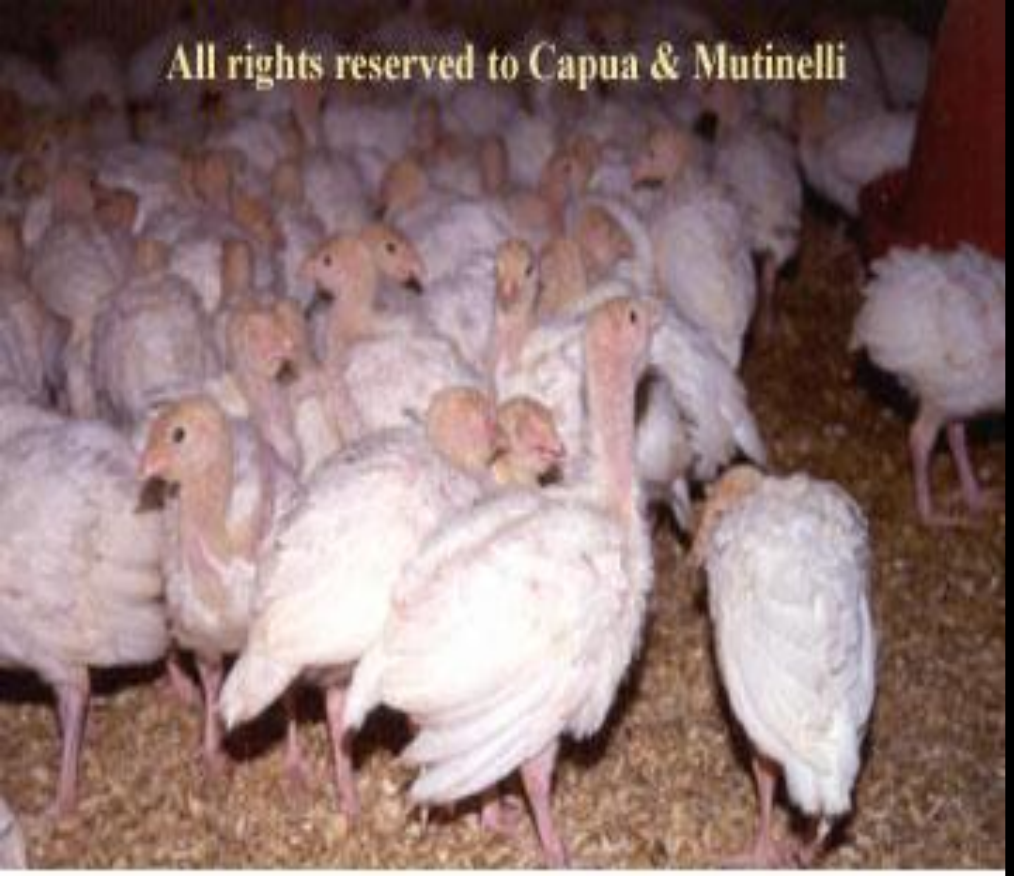
- Morphologic Diagnosis
- **Bursa of Fabricius: Acute diffuse edema with multifocal acute hemorrhage**
- Clinical Description
- **This image was taken 3 days post experimental inoculation with highly pathogenic avian influenza. There is moderate bursitis with petechial hemorrhages and edema of the mucosa.**
- Pathologic Description
- **The bursa of Fabricius has been opened to reveal the internal structure. The bursal folds are markedly swollen, glistening wet and stippled with numerous small red foci.**

ORGAN : Head of chicken
LESIONS : Swelling of head and cyanosis of comb& wattle
SUSP.DIS. : Avian influenza (AI)

ORGAN : Leg of chicken

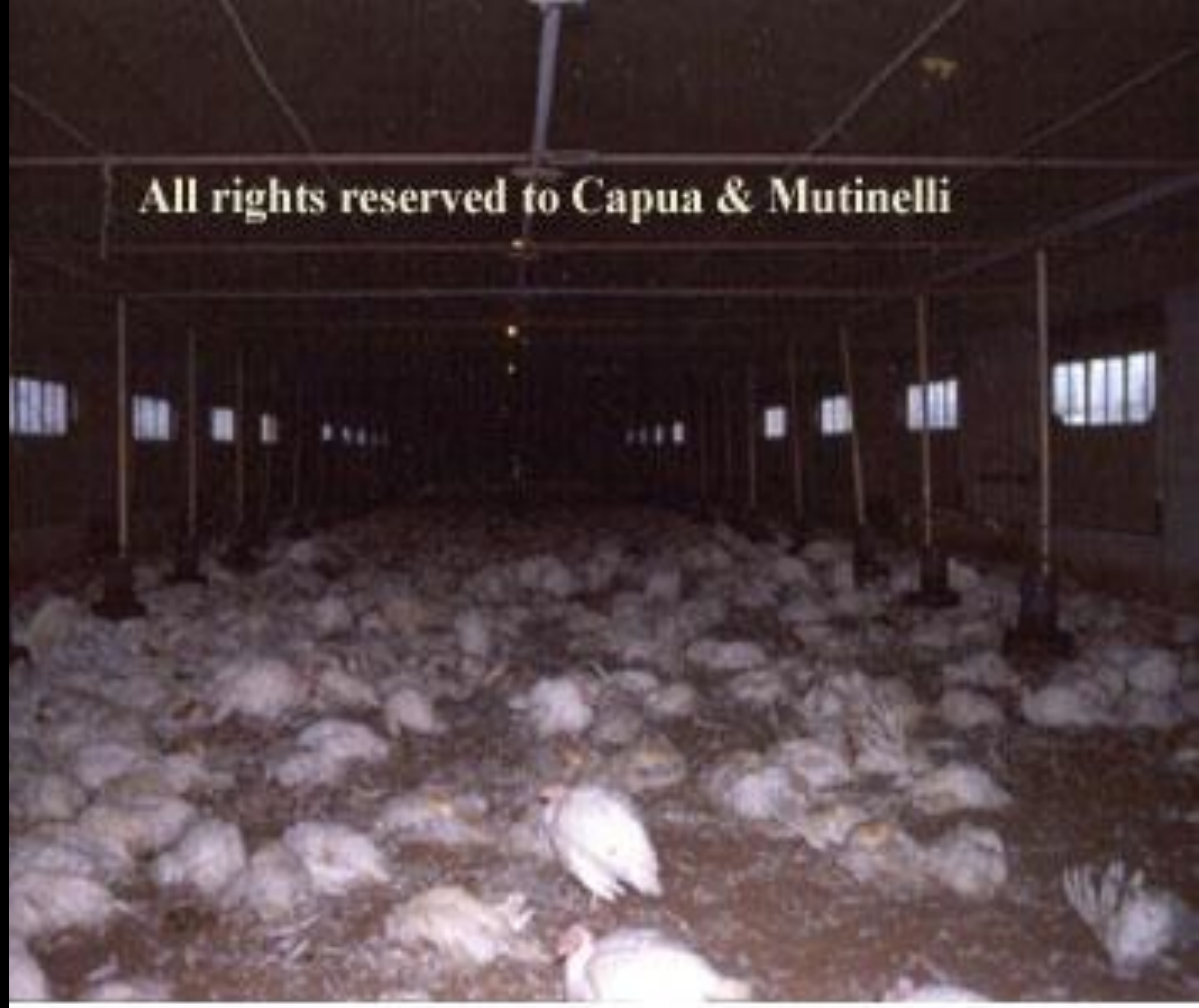
LESIONS : Hemorrhage in sub cut tissues

SUSP.DIS. : AI



28-day-old poults affected by LPAI, severe conjunctivitis and swelling of infraorbital sinuses, note also general depression and ruffled feathers.

28-day-old turkey affected by LPAI, caseous deposits in the infraorbital sinuses



28-day-old turkeys affected by LPAI, during the acute phase of the disease, high mortality and clinical appearance of the affected flock.

Broilar Breeder,HPIA, congestion&cyanosis of the comb and wattles.

haemorrhages on the hock.

caged layers,HPAI,prostration and reluctant to move in preagonic phase.

ORGAN : Chest cavity
LESIONS : Peticeal hemorrhages in coronary fat
SUSP.DIS. : AI , VV ND