



Equine Infectious Abortion Field Diagnostic Guidelines

Considerations for approaching equine abortion of unknown etiology

Infectious causes of equine abortion can impact both individual horse and herd health and may present as abortion outbreaks with the potential for significant economic loss. Equine abortion etiologies range from viral, fungal and bacterial infections to environmental or developmental factors. While the presence of pathognomonic gross necropsy lesions can narrow the equine abortion differential list, gross lesions are frequently lacking, and ancillary testing is necessary to reach a definitive diagnosis. Due to the contagious nature of some equine abortion pathogens, such as equine herpesvirus-1 (EHV-1), obtaining a definitive diagnosis is imperative to guiding targeted treatment strategies, implementing biosecurity protocols and launching epidemiological investigations. Proper diagnosis is essential, especially when necessary to eliminate the source of disease, as may be the case with equine arteritis virus (EAV) and *Taylorella equigenitalis*, the causative agent of Contagious Equine Metritis (CEM).

AAEP Infectious Abortion Differential and Diagnostic Flow Chart

Considerations for approaching equine abortion cases of unknown etiology

Infectious causes should be considered in any case of equine abortion, leading to implementation of biosecurity practices that limit herd mate exposure to the fetus, fetal membranes/fluids and dam.

Whether the disease is spread via aerosolization, direct contact or fomites, proper isolation and management of facilities and patients is critical to outbreak prevention. For further information regarding facility management and establishing a biosecurity perimeter during an outbreak, see the [AAEP Biosecurity Guidelines](#).

State animal health officials (SAHO) should be alerted promptly per state guidelines when abortion of an infectious and reportable etiology is suspected, including EHV-1 or *T. equigenitalis*.

Differential diagnosis for equine abortion (listed alphabetically)

Infectious:

- Ascending bacterial infection (*Streptococcus zooepidemicus* subsp *equi*, *Escherichia coli*, other *Enterobacter* spp, *Klebsiella pneumoniae*, *Pseudomonas aeruginosa*, [Taylorella equigenitalis](#))
- Equine arteritis virus (EAV)
- [Equine herpesvirus 1 and 4](#)
- [Equine infectious anemia \(EIA\)](#)
- Hematogenous bacterial infection
- [Leptospirosis](#)
- Mycotic placentitis (*Aspergillus* spp and *Candida* spp most common)
- [Neorickettsia risticii \(Potomac Horse Fever\)](#)
- Nocardioform placentitis (*Crossiella equi* and *Amycolatopsis* spp)

**Non-infectious:**

- Congenital abnormalities
- Fescue toxicosis
- Hydrops conditions
- Mare reproductive loss syndrome
- Persistent fever/severe systemic illness
- Placental anomaly / infarction / insufficiency
- Twins
- Umbilical cord torsion (greater than 4–5 twists)

Diagnostic approach for suspected cases of infectious abortion

- **Complete history** (including vaccine and recent travel history, environmental risk factors, breeding date, reproductive evaluations, diet and pasture evaluation)
 - Etiologies of abortion may occur within specific gestational windows and are described in the [AAEP Infectious Abortion Differential and Diagnostic Flow Chart](#).
- **Examination of the mare**
 - External examination – evaluate for general health as well as perineal conformation and vaginal discharge
 - Transrectal reproductive examination – perform transrectal palpation and ultrasonography to evaluate the uterine contents / tone and cervical tone / competency
 - Vaginal examination – perform to evaluate the cervical tone and competence and to look for cervical discharge or urine pooling
 - Mammary glands – evaluate for symmetry, shape, location and abnormal contents
 - Abdominal wall and prepubic region – evaluate for evidence of breakdown or trauma
- **Examination of the placenta**
 - Perform in an area away from other pregnant mares, ideally in an area that can be easily disinfected (such as a wash rack or wheelbarrow).
 - Avoid spraying or hosing the fetal membranes during examination, as this can lead to aerosolization of virus, the exposure of nearby horses and removal of potentially diagnostic material.
 - Weigh the placenta, which should typically be ~10% of the foal's weight.
 - Lay the placenta out in its entirety (see Figure 1) and evaluate the amnion (if present), chorioallantois and umbilical cord.
 - Evaluate the placenta for completeness. The placenta should be evaluated from both the chorionic and allantoic sides.
 - Evaluate the umbilicus to measure the length, estimate the number of twists, size, shape, edema or discharge.



- **Examination of the fetus/necropsy**
 - Perform in an area away from other pregnant mares, ideally in an area that can be easily disinfected (such as a wash rack or wheelbarrow).
 - Avoid spraying or hosing the fetus during examination, as this can lead to aerosolization of virus, the exposure of nearby horses and removal of potentially diagnostic material.
 - Evaluate the fetus for normal external anatomy with additional attention paid to the limb conformation, umbilicus, haircoat, presence or absence of incisors, and descent of testicles. The last three criteria can help estimate fetal age if breeding date is unknown.
 - Weigh the fetus and measure crown-to-rump length.
 - Fetal dissection should be performed in a routine fashion similar to adult horses plus evaluating the lungs for aeration.

- **Diagnostic testing**
 - Consult [AAEP Infectious Abortion Differential and Diagnostic Flow Chart](#)
 - Photos of fresh gross fetal or placental lesions may assist the pathologist in making a diagnosis
 - Samples to collect
 - Dam serum (RTT)
 - Dam EDTA whole blood (LTT)
 - Deliver fetus and placenta to diagnostic laboratory for necropsy (transport in cooler with ice packs if not delivering immediately)OR
 - Perform field fetal necropsy
 - Collect fresh and formalin-fixed specimens of approximately 3cm³ size, including any representative lesions.
 - Tissue sample selection tips:
 - Collect fresh and fixed placenta – samples should be collected from each uterine horn, the uterine body, the cervical region, umbilical cord, as well as any grossly abnormal regions. **(Figure 1)**
 - Collect fetal stomach contents and fresh and fixed tissues, including liver, spleen, lung, kidney, heart, lymph node, skin, skeletal muscle, thyroid, brain, fetal effusion for serology (pleural, pericardial or peritoneal in RTT).
 - Sample storage recommendations
 - Fresh tissues and stomach contents should be stored individually in sterile leak-proof containers. Refrigerate specimens and ship for next-day delivery to your diagnostic laboratory. If next-day delivery is not possible, freeze fresh tissues until next-day delivery is available.
 - Formalin-fixed tissues and placenta can be commingled and stored at room temperature.
 - Further information regarding diagnostic sampling can be found at [Diagnostic Sample Collection, Handling and Transport Guide](#).

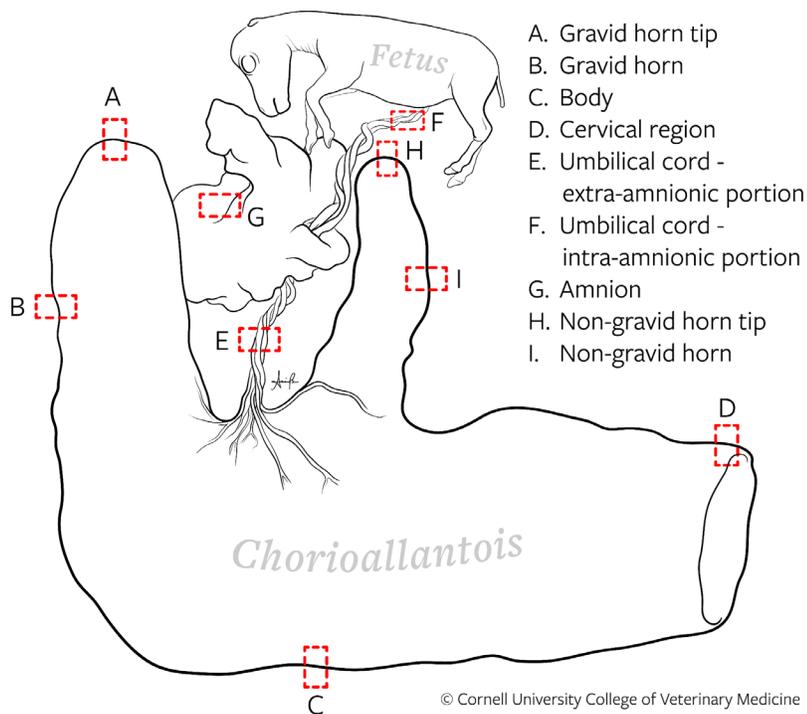


Figure 1. Fetoplacental Unit

If a definitive diagnosis is not achieved

- Monitor remaining pregnant mares for evidence of pregnancy complications or abortion, including premature mammary development, fever and unexpected vaginal discharge.
- Consult an infectious disease expert or theriogenologist.

Prevention

- Vaccination
 - Based on risk profile including stage of gestation, farm health history, frequency of travel, geographic location, and use (breeding, travel, competition).
 - See [AAEP Vaccination Guidelines](#)
- Follow [AAEP Biosecurity Guidelines](#) when sick horses are identified, when traveling or when introducing new horses
- Avoid stress and overcrowding
- Provide proper dam nutrition
- Follow routine reproduction-specific screening recommendations prior to breeding:
 - Mare testing – region-specific serology, endometrial bacterial culture
 - Stallion testing – region-specific serology, external reproductive tract bacterial culture



Abortion field necropsy sample collection worksheet

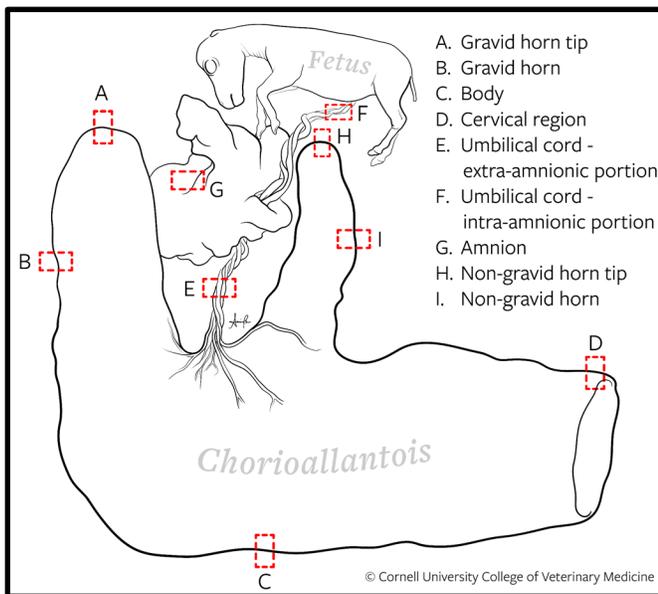
- Individually package fresh tissues in labeled, sterile, leak-proof containers
- Comingle fixed tissues in formalin
- Refer to the [AAEP Infectious Abortion Differential and Diagnostic Flow Chart](#) for specimens required for specific infectious disease testing.

Dam:

- Serum (RTT)
- EDTA whole blood (LTT)

Placenta (see figure below):

- Gravid uterine horn tip (A) and horn (B): fresh fixed
- Uterine body (C): fresh fixed
- Cervical region (D): fresh fixed
- Umbilical cord extra-amniotic (E) and intra-amniotic portions (F): fresh fixed
- Amnion (G): fresh fixed
- Non-gravid uterine horn tip (H) and horn (I): fresh fixed
- Grossly abnormal regions (location): fresh fixed



Fetus:

- Fetal stomach contents: fresh
- Liver: fresh fixed
- Spleen: fresh fixed
- Lung: fresh fixed
- Kidney: fresh fixed



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- Heart: fresh fixed
- Lymph node: fresh fixed
- Skin: fresh fixed
- Skeletal muscle: fresh fixed
- Thyroid: fresh fixed
- Brain: fresh fixed
- Fetal effusion (RTT) (location):

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