Uterine infection

The uterus is normally a sterile environment, but after calving nearly all cows have bacterial contamination of the uterine lumen. If this bacterial load persists, it results in uterine disease. This is a key cause of infertility due to endometrium inflammation. It can prevent the cow cycling, interfere with the intrauterine transport of sperm, or prevent embryo implantation.

Accurate and timely implementation of herd management programs reduce impact of the disease in individual animals and reduces the herd prevalence which is an important part of a fertility program.

Uterine infection is determined by the identification of abnormal content contained within the uterine lumen. Uterine infection can occur through infection introduced at calving, at other times when the cervix is open (such as natural and AI service), or when a pregnancy is no longer viable.

Uterine infection is determined based on the time since calving and state of the cervix.

Puerperal metritis

Puerperal metritis is the term used for an animal with an abnormally enlarged uterus and a fetid watery red-brown uterine discharge, together with signs of systemic disease within 21 days after parturition.

Clinical metritis

Animals that are not systemically ill but have an abnormally enlarged uterus, purulent uterine discharge in the vagina, and are within 21 days post partum.

Clinical endometritis

Clinical endometritis is characterized by the presence of a purulent uterine discharge detectable in the vagina 21 days or more after parturition.

Pyometra

Pyometra is defined as the accumulation of purulent material within the uterine lumen, the presence of a persistent corpus luteum and a closed cervix.
Uterine infection

The non infected uterus

Not all uterine infections can be detected by ultrasound. Many low grade infections don’t produce material which can be visualized.

Low grade infections can either be unidentifiable on the scan image or appear similar to the mucus of a cow in estrus. Ultrasound examination of the ovaries to determine the cycle stage is vital. The ultrasound examination should always be accompanied by vaginal examination.

A thorough ultrasound examination of the entire uterus – from the tip of both horns to the uterine body – needs to be completed to ensure uterine infection pockets are not missed.

**Fig 1** Echogenic streaking due to estrus mucus (M) – this can sometimes appear similar to a low grade endometritis.

**Fig 2** Empty non infected dioestral uterus; no echogenicity (mucus or other material) within the lumen (L). Endometrium (E)
**Fig 3** No purulent echogenic material is present within this part of the uterine lumen (L). Endometrium (E).

**Fig 4** Echogenic purulent material (EM) appears as a thin echogenic line in the uterine lumen – found during a thorough examination of the cow in fig 3. Endometrium (E).
Uterine infection

**Metritis**

- Present during the first 3 weeks post partum
- Usually diagnosed by the presence of a large amount of purulent material within the uterine lumen
- Purulent material is visualized by echogenic material of varying intensities within the uterus.

**Fig 5** A large area of echogenic material (EM) is seen within this uterine lumen.

**Fig 6** A large area of echogenic material (EM) is seen within this uterine lumen. (Note the varying echogenic intensities.)

**Endometritis**

- Present after 21 days post partum
- Can be diagnosed by the presence of echogenic purulent material in the uterine lumen.

The amount of purulent material can vary greatly. See fig 3 and 4 for low grade endometritis.

**Fig 7 and 8** Pockets of echogenic material (EM) within uterine lumen of cows with detectable endometritis.

**Fig 9** Large amount of echogenic purulent material (EM) from a cow with endometritis. (Visualizing a large amount of echogenic material within the uterine lumen is very unusual in an endometritis case.)

**Pyometra**

- Present after 21 days post partum
- With a closed cervix

Must be diagnosed by ultrasound, a vaginal examination alone will not show signs of discharge

Usually a large amount of purulent echogenic material is present in the uterus – easily identified by ultrasound examination.
Fig 7

Fig 8

Fig 9

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Uterine infection

Ultrasound is important when making a definitive diagnosis of pyometra.

Fig 10 and 11 Large areas of echogenic purulent material (EM) within the uterine lumen of a cow with pyometra. A vaginal examination didn’t reveal any purulent material.

Pregnancy complication

Echogenic purulent material can be identified in the uterine lumen at other times. If an infection occurs during pregnancy and compromises the fetus:
• The fetus will no longer have a heartbeat
• Fetal membranes will become flaccid
• Fetal fluids will become purulent and echogenic

The presence of placentomes and fetal membranes confirms the diagnosis as an infected pregnancy and not endometritis.

Fig 12 A placentome (P) is seen on the right side of this echogenic purulent material (EM) in the uterus.

Fig 13 Small placentome (P) on the left side of echogenic purulent material in the uterus. Ultrasound is the only method to distinguish these from a pyometra – a thorough examination should be performed.

Fig 14 Placentome (P) blending into the echogenicity of the echogenic purulent material (EM) in this pregnancy complication.

Fig 15 Care has to be taken in later pregnancies that the fluid echogenicity (E) of viable pregnancies is not confused with a complication. The presence of anechoic allantoic pockets (A) confirms the viability.
Visit our IMV imaging Academy at www.imv-imaging.com for a wide range of clinical guides and materials.

This quick guide is intended to help you start the learning process of identifying uterine infections.

A special thanks to John Dawson, for taking the time to develop this booklet for IMV imaging, and the farmers who supplied him with cows and materials to help him.