ENDOMETRIAL BIOPSY

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A uterine biopsy may be collected from a mare by a veterinarian to evaluate the histology or microscopic anatomy of the uterine lining or endometrium. The biopsy is primarily used as an aid in the diagnosis of uterine disease and as a prognostic indicator of the ability of a mare to carry a foal to term.

The primary indications for collection of an endometrial biopsy include examination of barren mares, problem breeding mares, and mares with a history of pregnancy loss, and as part of a pre-purchase evaluation of a potential broodmare. Samples may be collected prior to the onset of the breeding season, during the breeding season, or at the end of the breeding season. It is critical that the pregnancy status of the mare be confirmed, as collection of a biopsy from a pregnant mare will almost certainly result in pregnancy loss. A biopsy may be collected during any stage of the estrous cycle, although individual veterinarians may prefer to collect samples when the mare is either in diestrus or in early estrus.

To collect a biopsy sample, the tail is wrapped and held out of the way. The perineal area is cleaned by repeated washings with a non-residual soap and dried. A sterile endometrial biopsy instrument is guided into the vagina, and then carefully passed through the cervix into the uterus. The person collecting the sample then removes the arm that guided the biopsy instrument into the vagina and inserts it into the rectum to manually aid in directing the instrument to the base of a uterine horn. A small sample (1 to 2 cm) of endometrial tissue is obtained and placed into a fixative solution (Bouin's solution or 10% formalin) in a container labeled with the name of the mare, collection date, and other pertinent information.

The fixed biopsy specimen is submitted to a diagnostic laboratory where histologic sections of the endometrial sample are examined by a pathologist. In some cases, endometrial biopsies are evaluated by veterinarians at referral reproduction centers.

It has been reported that collection of a single biopsy sample from one site is generally representative of the entire endometrium, although collection of multiple samples may be advantageous in some mares.

Endometrial biopsy samples are examined for the presence of inflammatory and degenerative changes. Inflammation is recognized by the accumulation of inflammatory cells (white blood cells) in the endometrial tissue. Acute inflammation (i.e. a recent onset of inflammation) is recognized by the presence of a specific type of white blood cell called the polymorphonuclear leukocyte (PMN) or neutrophil. Chronic inflammation (i.e. long-

standing inflammation) is characterized by the presence of lymphocytes and other mononuclear cells in the endometrium. Inflammation may be infectious or non-infectious in origin, but is a potentially treatable pathologic condition.

The hallmark of degeneration of the endometrium is deposition of fibrosis or scar tissue around endometrial glands, often forming what are called glandular 'nests'. Other degenerative changes detected in biopsy evaluation include cystic dilation of glands and glandular necrosis. In contrast to inflammation, fibrosis represents a permanent, untreatable pathologic condition.

The endometrium is classified on a grading scale based on biopsy characteristics that ranges from I to III. Grade I endometrium is essentially normal, with minimal inflammation or fibrosis. Grade III endometrium includes severe inflammatory and/or fibrotic changes. Grade II is a broad category, often divided into subcategories IIA and IIB, encompassing mild to moderate pathologic conditions between Grades I and III.

Additional information as to the potential cause of endometrial pathology is often available from diagnostic tests performed in conjunction with the biopsy, such as ultrasonography, speculum examination, uterine culture and uterine cytology. As noted previously, fibrosis or scar tissue is considered a permanent condition. However, if the source of inflammation is identified and successfully treated, one would expect to see an improvement in the endometrial grade on a subsequent evaluation.

The endometrial biopsy is often used to determine the prognosis for a mare to carry a foal to term. Expected foaling rates for each endometrial biopsy category are given in the following table. Initial pregnancy rates decrease and pregnancy loss rates increase with each advanced grade of pathologic conditions. It must be emphasized that many additional factors, such as stallion and broodmare management, also play critical roles in conception and maintenance of pregnancy.

Expected foaling rates of mares according to endometrial biopsy grade

Grade	Degree of endometrial change	Expected foaling rate (%)
I	Absent	80-90
II A	Mild	50-80
II B	Moderate	10-50
III	Severe	<10