This guideline will help to identify the sensitivity of specific bacteria and/or yeast infections that infiltrate the internal and external reproductive tract of both stallion and mares. From this initial information, a window of procedural rational will allow the categorization of a stallion’s or mare’s potential for reproductive competence. When assessing the reproductive competency of a mare or stallion, a complete examination should take place with the following key points.

For mares: A uterine biopsy and culture with sensitivities & cytology should be performed when in estrus and/or prior to insemination of the repeat insemination of a barren mare; A complete endocrine evaluation for multiple year barren mares should be considered.

For stallions: A culture of the urethra before and after ejaculation and a semen culture whereby evaluation for a potential growth at 24, 36, 48 & 72 hours should be conducted twice monthly.
Commonly Used Intrauterine Drugs
Guidelines for Specific Use & Administration in Large Volume Lavages

**Antibiotics for Gram Positive Bacteria**

*Penicillin (Na⁺ or K⁺ Salt K-Penn)*
5 million units
Very effective for streptococci; economical and commonly used

*Ampicillin*
1-3 g
Use at high dilutions because it can be irritating; Na⁺ salt leaves precipitate on endometrium that remains in uterus for prolonged period

*Carbenicillin*
2-5 g
Reserved for persistent *Pseudomonas* (synergistic efficacy with amino-glycosides); usually given on alternate days with amino-glycosides; slightly irritating

**Antibiotics for Gram Negative Bacteria**

*Gentamicin Sulfate*
500-1000 mg
Highly effective; generally nonirritating when mixed with an equal volume of NaHCO₃ and diluted in saline

*Amikacin Sulfate*
2 g
Use for *Pseudomonas*, *Klebsiella*, and persistent gram-negative organisms

*Kanamycin Sulfate*
1 g
Toxic to spermatozoa; do not use close to breeding

*Polymyxin B*
1 million units
Gram-negative infections, particularly *Pseudomonas*

*Neomycin Sulfate*
3-4 g
Use for sensitive *E. Coli*; can be irritating; post breeding use of oral preparations containing neomycin mixed with other antimicrobials has lowered pregnancy rates in mares

*Nitrofurazones*
50-60 ml
Highly questionable effectiveness
Antibiotics for Gram Positive & Negative Bacteria

**Cephalozolin Sodium**
1 g
First-generation cephalosporin; has been used empirically once daily intramuscularly for 2-3 weeks; broad spectrum effectiveness against Gram-positive and Gram-negative bacteria

**Ticarcillin**
1-3 g
Use for *Pseudomonas*; do not use for *Klebsiella*

**Naxcel (Ceftiofur Sodium)**
1 g
Third-generation cephalosporin; has been used empirically once daily either intramuscularly or by intrauterine infusion; broad-spectrum effectiveness against Gram-positive and Gram-negative bacteria

**Povidone-Iodine**
(1%-4% of stock solution of Betadine, which is 0.5% Povidone iodine)
1 liter (lavage solution)
If solutions are too concentrated (e.g., >5% Betadine v/v), severe endometritis results and/or neutrophil function is impaired; in vitro bactericidal activity is maintained at concentrations as low as 0.01%-0.005%; indicated for lavage of uteri with nonspecific inflammation or fungal/yeast infections; should not be left in uterus

**Yeast Specific Drugs**

**Nystatin**
500,000 units
Primarily for yeast (e.g., *Candida albicans*) in the growing phase; dilute in 100 to 250 ml sterile water--makes an insoluble suspension that must be vigorously mixed immediately prior to infusion

**Amphotericin B**
200 mg
For infections with *Aspergillus, Candida, Mucor*, or *Histoplasma*; dilute in 100 to 250 ml sterile water--makes a relatively insoluble suspension

**Clotrimazole**
700 mg
For yeast infections (*Candida* spp.); available as cream, tablets, or suppositories; preferable treatment is with tablets crushed and mixed with 40 ml sterile water; generally infused after uterine lavage

**Miconazole**
200 mg
Most efficacious for yeast infections (*Candida* spp.), but has been used by some practitioners for resistant fungal infections in mares by infusing once daily for up to 10 days; dilute in 40-6- ml sterile saline prior to infusion
Drugs for Aggressive Reproductive Management

**Dimethylsulfoxide (DMSO)**
(5% of stock solution)
50-100 ml
Used as penetrating agent to carry drugs; effectiveness and safety unknown

**EDTA-TRIS** (1.2 g NaEDTA + 6.05 g TRIS/L of H2O, titrated to pH 8.0 with glacial acetic acid)
250 ml, then infuse antibiotic 3 hours later
EDTA theoretically binds Ca++ in bacterial cell walls, making cell wall permeable to antibiotic and thus more susceptible; use confined to persistent *Pseudomonas* infections

Commonly Used Drugs In Semen Extenders

**Gram Positive Activity**

**Penicillin (Na+ or K+ Salt) (K-Penn) +**
1 million units per 100ml of final semen extender solution.
Very effective for streptococci; economical and commonly used

**Gram Negative Activity**

**Amikacin Sulfate** -
1 mg per 1ml of semen extender solution.
Use for *Pseudomonas, Klebsiella*, and persistent gram-negative organisms

**Gentamicin Sulfate** -
1 mg per 1ml of semen extender solution.
Highly effective; generally nonirritating when mixed with an equal volume of NaHCO₃ and diluted in saline

**Polymyxin B** -
1 million units per 100ml of final semen extender solution.
Gram-negative infections, particularly *Pseudomonas*

**Gram Positive or Negative Activity**

**Ticarcillin + -**
1 mg per 1ml of semen extender solution.
Use for *Pseudomonas*; do not use for *Klebsiella*

**Naxcel (Ceftiofur Sodium) + -**
1 mg per 1ml of extender solution
Third-generation cephalosporin; has been used empirically once daily either intramuscularly or by intrauterine infusion; broad-spectrum effectiveness against Gram-positive and Gram-negative bacteria

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