

## UPDATE ON EQUINE THERAPEUTICS



# Libido, Erection, and Ejaculatory Dysfunction in Stallions

**ABSTRACT** Continuous access to mares and skillful handling are generally the best approaches to dealing with inadequate libido in stallions. Although the problem can occur in experienced stallions, it is more common in slow-starting novices. Erection dysfunction primarily occurs subsequent to traumatic injury of the penis, such as kick injuries or semen-collection accidents. Ejaculation dysfunction can result from neurologic and musculoskeletal or ejaculatory apparatus problems.

*University of Pennsylvania*  
**Sue M. McDonnell, PhD**

**S**exual behavior dysfunction in breeding stallions primarily includes libido or ejaculation problems. Libido-independent erection dysfunction is relatively rare in stallions and mostly limited to penile trauma complications. This column discusses stallion sexual behavior dysfunction with a focus on recently developed therapeutic approaches.

## Inadequate Libido

The most common type of inadequate libido involves slow-starting novice stallions. In most cases, the primary cause is simply inexperience with domestic breeding conditions rather than physiologic immaturity or an endocrine abnormality.

The keys to efficient turnaround for these stallions primarily involve

handler education and relatively simple and inexpensive management changes (see Management Conditions to Maximize Libido in Breeding Stallions). Housing that provides ample continuous exposure to mares and reduced contact with other stallions naturally drives stallion endocrinology and behavior in a positive direction.\* Patient, quiet handling in the breeding situation will almost always be more effective than any other approach. I recommend as little restraint as safely possible under the particular conditions, as much positive reinforcement as possible, and avoidance of punishment and negative experiences. Continuous free-pasture access to mares for several days or weeks often allows the stallion to gain experience and confidence "naturally." This almost always enables an easy transition to in-hand breeding.

If results must be produced quickly, exogenous hormones to increase circulating steroids can sometimes speed progress.<sup>2</sup> Short-term treatment with gonadotropin-releasing hormone (50 subcutaneously 2 hours and 1 hour before breeding) or aqueous testosterone (50 to 80 mg subcutaneously every other day for at least 1 week) can effectively increase circulating testos-

terone and boost libido. The greatest improvement in libido with testosterone treatment typically occurs after 4 to 7 days of treatment. Although it is often tempting to increase the dose of testosterone, there is concern about possible adverse side effects on pituitary gonadal function. Personnel must be taught that hormone treatment that increases sexual behavior is likely to simultaneously increase aggressive behavior. If the aggression is not anticipated and carefully directed or abided, mare or handler interaction with the stallion can be counterproductive. Hormone treatments usually can and should be withdrawn after a slow-starting

## KEY POINTS

- Inadequate libido can usually be effectively managed with handler education and simple, nomic management changes.
- Limiting mounting attempts, employing pharmacologic aids, and other management changes can reduce the work of a stallion with neurologic- or musculoskeletal-related ejaculation dysfunction.
- Ejaculatory apparatus problems include apparent dysfunction of the neural ejaculatory apparatus, pain associated with ejaculation, and genital tract pathology that may physically impair or cause pain during ejaculation.

novice stallion has had a few successful breedings.

Experienced stallions can also develop inadequate sexual arousal; this is often variable rather than consistent. Primary causes for variable or consistent low libido in experienced

**SERIES  
 EDITOR**

**Debra Deem Morris, DVM, MS**  
 North Jersey Animal Hospital, PA, Wayne, New Jersey

## Management Conditions to Maximize Libido in Breeding Stallions

### General Housing and Care

- Provide as much contact (direct, fence line, or in neighboring stall) with mares as possible and as little contact as possible with other stallions.
- Provide ample outdoor exercise and good ventilation when indoors.
- Keep stallion fit and lean.

### Breeding-Shed Experience

- Provide ongoing in-hand exposure to mares in a breeding situation (I recommend one or two 30-minute sessions daily or every other day).
- Provide exposure to a variety of stimulus mares in natural estrus, including both quiet and more active mares. Allow interaction with the mare's head, body, and tail; movement of the mare, particularly slow walking and stopping, is typically more stimulating to a stallion than is a fully restrained mare.
- Provide patient, creative, and skilled handlers who can confidently and quietly control a stallion that is showing normal vigorous sexual behavior.
- Allow mounting without an erection; this is a normal behavior of stallions that can be eliminated once the stallion is breeding normally.
- Expect an irregular rate of improvement.

breeding stallions include handling changes, negative experience associated with breeding, a heavy breeding schedule, suboptimal stimulus mares, testicular degeneration, musculoskeletal discomfort, or other pain or illness. It is usually difficult to determine the causal factors. However, I recommend treating any suspected discomfort and then proceeding as described for a slow novice, reviewing all possible contributing factors with the goal of optimizing all aspects of the breeding and management environment.

### Rowdy Breeding-Shed Behavior

Stallions are by nature quite variable in their level of sexual arousal. High libido can be problematic for some breeding operations. The handling challenge is to safely direct and accommodate energetic stallions without discouraging normal sexual behavior (see Management and Pharmacologic Aids to Facilitate, Ejaculation). Case reports detailing the implementation of these handling recommendations have been published and can be useful reading for most stallion managers."

### Erection Dysfunction

Penile erection in a sexual context depends on adequate sexual arousal and a functional pelvic and penile neurovascular apparatus.' Libido-independent erection dysfunction is rare in breeding stallions. The majority of cases that do occur are subsequent to traumatic injury of the penis, including stallion-ring injuries, paralyzed penis and paraphimosis, kick injuries, and other 'breeding or semen-collection accidents. Artificial-vagina insertion problems are relatively common, particularly with "self-serve" dummy mounts. Another common semen-collection accident involves penile laceration associated with the failure to remove a thermometer from the lumen of the artificial vagina.

Although rare, aortoiliac thrombosis that impairs pelvic circulation can result in inadequate tumescence, particularly on exertion during mounting and thrusting. Neurologic disease can also be manifest in erection dysfunction (e.g., premature and exaggerated tumescence of the glans penis).<sup>8</sup>

A potentially confusing type of erection dysfunction involves the pe-

nis folding back within the prepuce as tumescence commences. Typically, the stallion appears aroused and ready to mount despite no visible erection. The stallion may also appear uncomfortable or intermittently distracted, pinning the ears, kicking toward the abdomen, or stepping awkwardly on the hind legs. Close visualization reveals a rounded, full-appearing prepuce with the skin stretched taut as the penis doubles back on itself within the prepuce. Resolution usually requires removing the stallion from the sexual situation until the penis detumesces. After the penis is fully withdrawn, applying a lubricating ointment to the prepuce is usually adequate to facilitate subsequent normal protrusion.

This situation tends to repeat occasionally over time with particular stallions. I have noted this condition to repeat in stallions that accumulate large amounts of smegma as well as in stallions in which the penis and sheath are fully cleansed one or more times daily for breeding. One might speculate that this tendency may be related to too much accumulated "sticky" smegma or too little normal smegma lubrication. I have seen one stallion appear to suffer secondary psychologic libido dysfunction associated with a relatively frequent occurrence of this event.

Erection is not requisite for semen collection in stallions with an active libido. Vigorous manual and thermal stimulation of the base of the penis typically elicits pelvic thrusting adequate to achieve ejaculation, either with the horse mounted or standing on the ground.<sup>9</sup> Pharmacologic aids to enhance erection or enhance or induce ejaculation without erection can also be useful in prolonging the breeding life of stallions with inadequate erection.

### Ejaculation Dysfunction

#### Neurologic and Musculoskeletal Problems

Most cases of ejaculatory dysfunc-

## Management and Pharmacologic Aids to Facilitate Ejaculation

### To enhance sexual arousal

- Excellent stallion handling
- W Prolonged teasing **under** conditions that yield the highest safe level of arousal
- Breeding schedule for maximum arousal
- Natural estrus stimulus and mount mares
- Minimal distractions in the breeding area
- Established breeding routine rich with conditioned stimuli for maximum arousal
- 1 Encouragement and positive reinforcement
- Gonadotropin-releasing hormone (50 µg subcutaneously 2 hours and 1 hour before breeding)
- Diazepam (0.05 mg/kg via slow intravenous administration)

### To reduce back and hindlimb pain and accommodate musculoskeletal deficiencies

- Mount mare or dummy of appropriate height and conformation
- Excellent physical facilities for breeding (e.g., good footing, head room)
- Stable (no side-to-side movement) mount mare or dummy
- Mount mare or dummy placed on a downgrade from stallion to reduce weight on hindlimbs
- Semen collection on the ground (artificial vagina or manual stimulation)
- Weight loss to reduce work of hindlimbs, particularly during breeding
- Lateral support at the hips during mount
- Good footing (e.g., grass or dry athletic surface)
- Phenylbutazone (1 g orally twice daily)<sup>3</sup>
- Acupuncture and associated therapies<sup>4,5</sup>

### To increase positive stimulation of the penis

- Pressure and temperature of artificial vagina that yields most vigorous thrusting
- Hot compresses applied to the base of the penis

### To lower ejaculatory threshold in copula

- Imipramine hydrochloride (500 to 1000 mg orally in grain 2 to 4 hours before breeding)<sup>2</sup>

tion seem to involve neurologic and musculoskeletal problems that affect the stallion's ability to mount and thrust as the primary cause of breeding failure. Musculoskeletal and neurologic examinations are often difficult to interpret because positive findings typically do not explain the degree of breeding dysfunction. Stallions with musculoskeletal or neurologic problems can continue breeding with therapy aimed at maximizing libido, reducing discomfort, and improving strength and stability during breeding.

There are also a variety of management changes that can be instituted

at little cost to accommodate special needs of the stallion. One practical recommendation is to approach each breeding or semen-collection session with the goal of optimizing conditions for the first mount and confining attempts to three or four to limit the wear and tear on the stallion. Another useful technique for disabled stallions is to collect semen with the stallion standing on the ground, using an artificial vagina or manual stimulation.<sup>10-12</sup> Pharmacologic aids can also be useful in enhancing ejaculatory function in copula.<sup>13</sup> Adjusting the breeding schedule, mare manage-

ment, or using chilled or frozen semen can also reduce the work of a stallion (see Management and Pharmacologic Aids to Facilitate Ejaculation). My general approach is to consider and simultaneously implement as many appropriate aids as possible.

### Ejaculatory Apparatus Problems

A smaller percentage of ejaculation dysfunction cases seem to be specific to the ejaculatory apparatus as opposed to a musculoskeletal problem impairing mounting and thrusting. Specific diagnoses of primary and secondary problems are difficult. In cases of slow or intermittent ejaculation, ejaculation pattern and semen character can suggest further diagnostic procedures. Signs of infection, occlusion, or urine contamination can be followed with **ultrasonographic** and endoscopic examinations of the pelvic urethra and accessory sex glands. **Neurologic** problems specific to the ejaculatory apparatus are suggested by variation in semen pH, concentration, and volume and sperm numbers as well as intermittent urine contamination of semen and variable ejaculatory pulse pattern and strength. Pharmacologically induced ejaculation can be useful to obtain semen for freezing or as an occasional emergency back-up technique for extremely disabled stallions.<sup>17</sup> Several different protocols are useful (Table One). In their current stage of development, each protocol requires specific tedious collection procedures and none is likely to produce ejaculation in more than 60% of attempts.

### References

1. McDonnell SM: Stallion behavior and endocrinology-What do we really know? *Proc 41st Annu AAEP Meet*:18-19, 1995.
2. McDonnell SM: Normal and abnormal sexual behavior. *Vet Clin North Am Equine Pract* 8(1):71-89, 1992.
3. McDonnell SM, Love CC, Pozor MA, Diehl NK: Phenylbutazone treatment in breeding stallions: Preliminary evidence for no effect on semen or testicular size. *Theriogenology* 37: 1225-1232, 1992.
4. Martin BB, Klide AM: Diagnosis and

**TABLE ONE**

Pharmacologically Induced Ex Copula Ejaculation Protocols for Stallions

<i>Drug (Starting Dose)</i>	<i>Ejaculate Characteristics Compared with Artificial Vagina</i>	<i>Latency to Ejaculation(min)</i>
Xylazine hydrochloride <sup>14</sup> (0.66 mg/kg IV)	Similar	1-20 (usually less than 5)
Imipramine hydrochloride <sup>13,15,16</sup> (2.2 mg/kg IV)	Lower volume and higher sperm concentration, greater total number of sperm, no gel	10-60
Imipramine hydrochloride (0.75-2 mg/kg PO) followed in 1-2 hr by xylazine (0.3 mg/kg IV) <sup>18</sup>	Lower volume and higher sperm concentration, greater total number of sperm, no gel	3-15 (after xylazine administration)
Prostaglandin F <sub>2α</sub> (0.005-0.01 mg/kg IM)	Greater volume of semen and gel, similar concentration, greater total number of sperm	5-90

*IM* = intramuscularly, *IV* = intravenously, PO = orally.

treatment of chronic back pain in horses. *Proc 43rd Annu AAEP Meet*:310-312, 1997.

5. Martin BB, Klide AM: Acupuncture for treatment of chronic back pain in horses, in Schoen AM (ed): *Veterinary Acupuncture, Ancient Art to Modern Medicine*. Goleta, CA, American Veterinary Publications, 1994, pp 533-542.
6. McDonnell SM, Turner RM, Diehl NK: Modifying unruly breeding behavior in stallions. *Compend Contin Educ Pract Vet* 17(3):411-417, 1995.
7. McDonnell SM: Ejaculation: Physiology and dysfunction. *Vet Clin North Am Equine Pract* 8(1):57-70, 1992.
8. McDonnell SM, Love CC, Martin BB, Reef VB: Ejaculatory failure associated with aortic-iliac thrombosis in 2 stallions. *JAVMA* 200(7):954-957, 1992.
9. Love CC, McDonnell SM, Kenney RM: Manually assisted ejaculation in a stallion with erectile dysfunction subsequent to paraphimosis. *JAVMA* 200(9):1357-1359, 1992.
10. Crump J, Crump J: Stallion ejaculation induced by manual stimulation of the penis. *Theriogenology* 3 1(2):341-346, 1989.
11. McDonnell SM, Love CC: Manual stimulation collection of semen from stallions: Training time, sexual behavior, and semen. *Theriogenology* 33(6):1203-1210, 1990.
12. McDonnell SM, Pozor MA, Beech J, Sweeney RW: Use of manual stimulation for collection of semen from an atactic stallion unable to mount. *JAVMA* 199(6):753-754, 1991.
13. Turner RM, Love CC, McDonnell SM, et al: Imipramine treatment of urospermia in a stallion with a dysfunctional bladder. *JAVMA* 207(12):1602-1606, 1995.
14. McDonnell SM, Love CC: Xylazine-induced ex copula ejaculation in stallions. *Theriogenology* 36:73-76, 1991.
15. McDonnell SM, Odian MJ: Imipramine and xylazine-induced ex copula ejaculation in stallions. *Theriogenology* 41(5):1005-1010, 1994.
16. McDonnell SM, Oristaglio-Turner RM: Post-thaw motility and longevity of motility of imipramine-induced ejaculates of pony stallions. *Theriogenology* 42:475-481, 1994.
17. Oristaglio-Turner RM, McDonnell SM, Hawkins JF: Pharmacologically-induced ejaculation to obtain semen for freezing in a stallion with a spiral fracture of the radius. *JAVMA* 206(12):1906-1908, 1995.
18. Johnson PF, DeLuca JL: Chemical ejaculation of stallions after the administration of oral imipramine followed by intravenous xylazine. *Proc 44th Annu AAEP Meet*:12-15, 1998. □

### Highlights (continued from page 195)

to market specific products (e.g., biologicals) have not been embraced by the veterinary profession.

### What the Future Holds

The future of exotic animal medicine must involve not only private practitioners but also private industry and academia. Veterinary schools should integrate courses on birds and other commonly encountered exotic pets into their curricula. Information on the basic physiology of many exotic animal species needs to be available in textbooks, and research into the pathogenesis of exotic animal diseases remains to be conducted. Such research will need private funding as well as the financial support of practicing veterinarians and the public.

Leaders in the field of exotic animal medicine should scrutinize current continuing education (CE) techniques. Traditional veterinary education progresses from the normal patient to the diseased patient to clinical management of the patient. Often current CE emphasizes drug doses for treatment rather than the pathogenesis of the disease. CE lectures rarely define the normal anatomy and physiology of exotic pets.

Finally, the future of exotic animal medicine depends on the willingness of private practitioners to continue demanding the best care for their patients. The advances made during the past 20 years have allowed exotic animal specialists to manage patients with the same degree of professionalism followed in the more traditional companion animal practices. □