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## Cryptorchidism and associated problems in animals<sup>1</sup>

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### Abstract

Cryptorchidism is not a single disease; it apparently results from failure of one of at least two functions involving products of Leydig cells. Cryptorchidism is symptomatic of underlying testis dysgenesis. Precise terminology is important to distinguish and understand three phases of testis descent. Abdominal translocation involves holding a testis near the internal inguinal ring plus slight downward migration, via an enlarged gubernaculum (Ins13 obligatory) as the abdominal cavity expands away. Concurrently, a cylindrical evagination of peritoneum invades the gubernaculum, cremaster muscle(s) develop within the gubernaculum, and the cephalic ligament regresses (testosterone not obligatory). Transinguinal migration moves the testis through the abdominal wall, via the inguinal canal distended by the gubernaculum. Inguinoscrotal migration involves subcutaneous movement of gubernaculum, vaginal process, epididymis, and testis to proper positions in the scrotum. Directional guidance is provided by chemoattractant calcitonin gene-related peptide, secreted by the genitofemoral nerve (testosterone dependent). Probably incidence of cryptorchidism is higher in companion animals or pigs than in cattle or sheep. In dogs and horses, a retained testis most commonly is abdominal. In horses, but not other species, retention of testes within the inguinal canal is common. In humans, subcutaneous testes predominate. Overall, cryptorchidism usually is unilateral; scrotal testes in unilateral cryptorchid males often produce fewer than normal numbers of sperm, with an increased percentage of abnormal sperm. Non-cryptorchid siblings might manifest similar testicular dysgenesis. Although risk of tumors is greater for cryptorchid males, non-cryptorchid males also develop testis tumors. Germ cell tumors are most common in dogs and horses. Leydig or Sertoli cell tumors are not unusual in dogs. Testis tumors rarely are reported for cattle, pigs, sheep, and rabbits; in cattle Leydig cell tumors are twice as common as Sertoli cell tumors. Producers and veterinarians should recognize that inadvertent exposure of a pregnant dam to estrogenic or anti-androgenic agents could result in testicular dysgenesis.

**Keywords:** cryptorchidism, testis descent, testis dysgenesis, testis tumors, terminology.