

Owner information sheet regarding urinary incontinence

Causes of incontinence: Urethral incompetence (or urethral sphincter mechanism incompetence) is the most common cause of incontinence in adult female dogs. Other causes include anatomic abnormalities such as ectopic ureters or hypoplastic urethra, urinary tract infection, stones, and so called overactive bladder.

Treatment options for urethral incompetence: Urinary incontinence caused by urethral incompetence may be treated by oral medications, surgery to increase urethral outflow resistance or periurethral collagen injections. These will each be explained in detail below. Please ask any questions you have about the treatment options.

Medications: The preferred medication for treatment of urethral incompetence in female dogs is the α -adrenergic agonist **phenylpropanolamine** (also known as **PPA**) at 1.1-1.5 mg/kg orally every 8 hours initially, and then decreasing the frequency to every 12 hours to the minimum effective dose. Estimates are that about 70% of dogs are continent with oral medications such as PPA. The dose-related side effects of PPA in dogs include excitability, panting, restlessness, irritability, and hypertension (high blood pressure). Phenylpropanolamine should **not** be used in patients with hypertension. An alternative medication is oral estrogen therapy with **diethylstilbestrol** (DES). DES is administered at 0.1 to 1.0 mg/dog daily for 5 days followed by 0.1 to 1 mg/week. The minimum effective dose should be used for maintenance. Excessive administration of DES can cause bone marrow aplasia (lack of blood cell production) and signs of estrus. If DES doesn't work, you should **not** give more than recommended because of the potential for fatal bone marrow aplasia. The combination of DES and PPA is synergistic and may work in dogs that are unresponsive to either drug alone. A recent report from Europe indicates that treatment with GnRH analogues may resolve refractory urinary incontinence in female dogs. The exact mechanism is unknown and there is little experience with GnRH analogues in dogs at this time and side effects from repeated usage are unknown.

Surgery: Surgery to increase urethral outflow resistance is only successful in approximately 53 to 56% of dogs and some dogs respond initially but relapse over time. The two most commonly recommended treatments are colposuspension and urethropexy. Because of the relatively low success rate and the invasive nature of the surgery, this is not a preferred method of treatment unless dogs fail other treatment options.

Periurethral collagen injections: Collagen injectable materials may be injected around the urethra (periurethral) to narrow the urethral lumen and facilitate urethral closure by the urethral musculature. The collagen injectable material most commonly used in humans and previously reported for use in dogs is glutaraldehyde cross-linked collagen suspension (Contigen[®], Zylplast[®]). This is an inert form of collagen which may be gradually remodeled and removed by the body. Previous studies of the efficacy of periurethral collagen injections in dogs have shown a success rate for collagen injections alone of 53 to 68% with additional dogs being continent with supplemental

medication (usually PPA). Some dogs have partial improvement with collagen injection alone and regain continence with supplemental medication even though they were unresponsive to the medication prior to the collagen injections. The mean duration of continence after collagen injection was 17 months in one study. Repeat injection of collagen may be performed in dogs with respond well initially then have a relapse of incontinence months later.

Injectable collagen material: The collagen injectable material being studied in this clinical trial is a naturally derived collagen that is biologically active and has the potential to actually increase the function of the urethral muscle in addition to acting as a bulking agent. Therefore it has the potential to be effective for longer period of time than glutaraldehyde cross-linked collagen. An earlier derivation of this collagen was injected into research dogs to evaluate safety. There were no adverse reactions to a similar collagen material in dogs followed for as long as 1 year after the periurethral collagen injections.

Potential side-effects from collagen injections: Side effects have been uncommon following periurethral collagen injections in dogs. In one study there were no reported side-effects and in another study 15% of dogs had transient side-effects of straining to urinate or blood in the urine after the procedure. In humans, the most severe side-effect after periurethral collagen injections is inability to urinate from urethral obstruction because of excessive narrowing of the urethral lumen immediately after the procedure; however this has not been reported in any dogs. In humans with urethral obstruction insertion of a urinary catheter or cystoscope allows remodeling of the collagen implants which resolves the obstruction. In the unlikely event of urethral obstruction immediately following collagen injections in this study, repeat cystoscopy and partial dilation of the narrowed urethral lumen will be performed at no addition charge to the client.