



CASCADE 2027 NON-CONFIDENTIAL SUMMARY »

Noninvasive Ultrasound Treatment for Feline Urinary Stones

Overview

Urinary stones are a common and often life-threatening problem in cats, and current treatment options are limited. Surgery to remove or bypass an obstructing stone is invasive, costly, and carries meaningful risk of complications, and many general veterinary practices lack access to the specialists needed to perform it. This technology adapts a noninvasive ultrasound-based stone-fragmentation platform — originally developed for human kidney stone treatment — for use in cats. The system uses a handheld, ultrasound-guided transducer to deliver focused acoustic bursts that break urinary stones into pieces small enough to pass naturally, offering veterinarians a nonsurgical alternative intended to reduce cost, risk, and recovery time for feline patients.

- Cats commonly develop upper urinary tract stones that can obstruct the ureter, causing pain, kidney damage, and risk of death if untreated.
- Existing minimally invasive options used in human medicine (shock wave lithotripsy, laser lithotripsy) do not work well in cats because feline stones resist shock-wave fragmentation and the feline ureter is too small for laser instrumentation.
- This technology repurposes and miniaturizes a proven human ultrasound lithotripsy platform, with a transducer and acoustic parameters redesigned specifically for feline anatomy.

Description

The core technology, known as burst wave lithotripsy (BWL), uses a focused ultrasound transducer to deliver short harmonic bursts of acoustic energy directly to a urinary stone, inducing cyclic mechanical stress that fractures the stone into small fragments capable of passing naturally through the urinary tract. An integrated ultrasound imaging probe allows the treating veterinarian to visualize and target the stone in real time, combining diagnosis and treatment into a single noninvasive procedure.

Because feline anatomy differs substantially from human anatomy — including a much smaller ureteral diameter, a shallower skin-to-stone depth, and a different optimal acoustic window — the research team redesigned the transducer geometry and treatment frequency (approximately 650 kHz) specifically for cats, rather than simply scaling down the human device. In vitro testing on natural feline calcium oxalate stones demonstrated that the BWL system could reduce, on average, 73–97% of stone mass to fragments smaller than 1 mm within 30–50 minutes of treatment. Preclinical in vivo testing in a porcine kidney/ureter model showed no significant tissue injury.

COMOTION REFERENCE »

BDP 8524

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The technology has since advanced into a feline clinical trial. In a published single-arm clinical study, 11 client-owned cats with obstructive ureteroliths were treated with the adapted BWL system; ureterolith fragmentation was observed in the large majority of treated ureters, and roughly 80% of obstructing stones ultimately passed, with associated improvements in kidney function markers. One serious device-related adverse event (transient worsening of obstruction, resolved with retreatment) was reported, and the study concluded that more than one treatment session is often required with the current system.

Technology Readiness Level (TRL)

TRL 6 — Full system prototype tested in a relevant operational environment that reflects real-world application.

The adapted feline BWL system has progressed beyond bench-top and preclinical animal testing into a published clinical study in client-owned cats with obstructive ureteroliths, demonstrating measurable safety and efficacy outcomes.

Value Proposition

- **Nonsurgical alternative:** Offers an alternative to subcutaneous ureteral bypass or stent placement, procedures that carry meaningful perioperative mortality and long-term complication risk in cats.
- **Combined diagnosis and treatment:** Integrates diagnostic ultrasound imaging and stone treatment into a single, same-visit procedure, potentially avoiding referral to a specialty surgical center in some cases.
- **Built on a validated platform:** Builds on a stone-fragmentation technology already advancing through human clinical trials, lending technical credibility to the veterinary adaptation.
- **Leverages existing equipment:** Is designed around ultrasound-guided delivery, a modality many veterinary practices are already familiar with for diagnostic imaging.
- **Potential cost and recovery benefits:** May reduce total cost of care and recovery time relative to surgical treatment, though comparative cost data have not been independently validated.

Intellectual Property Position

Patent application in progress.

Market Opportunity

- Target customers include general small-animal veterinary practices and academic or specialty veterinary urology/nephrology referral centers, with veterinarians serving as both primary users and purchasing decision-makers.
- Current standard of care for cats that fail medical management is placement of a subcutaneous ureteral bypass device or ureteral stent, procedures reported in the peer-reviewed literature to carry meaningful perioperative mortality and long-term complication risk.
- Feline urinary stones are a recognized cause of morbidity, mortality, and emergency veterinary visits, with limited non-surgical treatment options currently available.
- The underlying human-focused BWL technology has already been licensed to an external company advancing it through FDA-regulated clinical trials, an existing relationship that could potentially extend to a veterinary-specific product line.

- Veterinary medical devices intended solely for animal use are generally not subject to FDA premarket approval in the United States, which may lower regulatory barriers relative to the human medical device pathway; specific labeling requirements should be confirmed with regulatory counsel.

References

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2. Maxwell AD, Kim GW, Furrow E, Lulich JP, Torre M, MacConaghy B, Lynch E, Leotta DF, Wang YN, Borofsky MS, Bailey MR, "Development of a burst wave lithotripsy system for noninvasive fragmentation of ureteroliths in pet cats," BMC Veterinary Research, 2023. <https://doi.org/10.1186/s12917-023-03705-1>
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