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Law Of Urination In Mammals, Could Help Treat Urinary Disorders

By Scott Bickard



Elephants

Despite differences in size, mammals such as dogs, goats, cows, and elephants (and not humans) all take around 21 seconds to urinate, according to a new study by researchers at the Georgia Institute of Technology. They've summarized their finding through a mathematical formula dubbed "the universal law of urination".

Researchers collected data by analyzing the urinary habits of a variety of zoo mammals through high speed film, *New Scientist* reported.

Size of the mammal is mostly unrelated to duration, the study found. That relationship can be written by taking the length a mammal takes to urinate and setting it equal to its mass raised to the power of one sixth. Given the small exponent, changes in mass exert little influence.

Size of the urethra is more important, scientists said, and makes up for mass differences. A dog will have a smaller bladder than an elephant, but the elephant will have a much larger urethra. A longer urethra gives incoming urine time to build speed and empty at a faster rate than the bladder of a smaller animal.

Taking into account mass, length of urethra, and previous studies that mostly studied bladder pressure, researchers constructed a mathematical formula that nearly always equals 21.

Patricia Yang and colleagues, who've previously studied the urinary patterns of dogs, hope their research will help solve urinary infections in elephants and other mammals. They also believe their work could possibly trigger new designs for water towers.

Because of a variety of factors, the law does not apply to humans.