

Science

21 Seconds: How Long Scientists Found It Takes All Mammals to Do This

Oct. 18, 2013 2:31pm [Liz Klimas](#)

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OK, urination is maybe not the most savory of topics. Still, a new discovery made by scientists is just too fascinating to ignore.

While urology is a well-studied field, relatively little research had been done about the actual physics of urination. That is, until a team of scientists made an observation while visiting Zoo Atlanta and turned it into a full-on study.

What Georgia Tech researchers noticed was that mammals, regardless of their respective size, take about the same amount of time to empty their bladders. Further analysis showed it takes all mammals about 21 seconds to complete urination.



A new study has found that all mammals, regardless of size, take about 21 seconds to empty their bladders. (Image source: Shutterstock.com/TheBlaze)

Calling it the “Law of Urination” the team, led by Patrician Yang, used both experimental and theoretical investigation to explain “**the hydrodynamics of urination** across five orders of magnitude in animal mass, from mice to elephants.”

Whether the animal’s bladder was large enough to hold 100 liters of fluid or only 100 milliliters, it still took an average of 21 seconds.

Here’s more about the finding **published in Cornell University’s arXiv**, a library for pre-prints of scientific papers (emphasis added):

*This feat is **made possible by the increasing urethra length of large animals which amplifies gravitational force and flow rate.** We also demonstrate the challenges faced by the urinary system for rodents and other small mammals for which urine flow is limited to single drops. Our findings reveal the urethra evolved as a flow-enhancing device, enabling the urinary system to be scaled up without compromising its function. **This study may help in the diagnosis of urinary problems in animals and in inspiring the design of scalable hydrodynamic systems based on those in nature.***

These findings will be presented at the American Physical Society Division of Fluid Dynamics meeting in Pittsburgh next month.

The researchers did release video taken with their high-speed camera for the study. Be aware, it features a bunch of mammals urinating (and some other bodily functions as well):

If you didn’t watch the video (not that we blame you), it ends with a challenge: “Don’t believe us. Try it at home.”

(H/T: [Discover magazine](#))

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