

# Device enables world's first voluntary gorilla blood pressure reading

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The Georgia Tech team that developed the Gorilla Tough Cuff and a Zoo Atlanta trainer position the pressure cuff casing inside the rectangular mesh trap so that a gorilla's blood pressure can be measured. Credit: Zoo Atlanta

Zoo Atlanta recently became the first zoological institution in the world to obtain voluntary blood pressure readings from a gorilla. This groundbreaking stride was made possible by the Gorilla Tough Cuff, a blood pressure reading system devised through partnership with the Wallace H. Coulter Department of Biomedical Engineering at Georgia Tech and Emory University.

Created as a senior design project by biomedical engineering undergraduates David Sotto, Nisha Bhatia, Stephanie Drewicz and Scott Seaman, the prototype has now been successfully tested on one of Zoo Atlanta's 22 western lowland gorillas. The students also had guidance

from Hanjoong Jo, the Ada Lee and Pete Correll Professor in Biomedical Engineering and the Division of Cardiology; and Professor Franklin Bost, the Coulter Department director of design instruction.

"Zoo Atlanta is home to the nation's largest collection of gorillas, so there is an ongoing responsibility to contribute to the zoological community's understanding of their care," said Dennis Kelly, President and CEO. "We are proud to have spearheaded an effort that will ultimately benefit gorillas living in captive settings around the world."

The Gorilla Tough Cuff operates in the same manner as the mechanism familiar to humans, with the patient slipping an arm into a cuff. As the cuff inflates, the [blood pressure](#) reading is measured and displayed on a monitor. The student design team's biggest set of challenges, however, was constructing a durable, comfortable cuff large enough to fit an adult male gorilla weighing upwards of 300 pounds.

The [prototype system](#) was comprised of a blood pressure cuff bolted to a casing made of acrylonitrile butadiene styrene (ABS) plastic. The casing was zip-tied to a rectangular mesh trap and the trap was temporarily attached to the gorilla cage. The pressure cuff tubing was connected to an off-the-shelf veterinary blood pressure monitor located outside of the gorilla cage.

"We also built a safety mechanism into the device so that the gorillas would not be injured if they became alarmed or frightened and tried to remove their arm from the cuff," said Sotto, who is currently a graduate student at Georgia Tech.

Once the prototype was complete, the Tough Cuff had its first tester: Ozzie, a 48-year-old male western lowland gorilla. Gorillas aren't typically keen on the idea of inserting their arms into inflatable cuffs: Ozzie's accomplishment is the result of months of patience and diligent

voluntary positive reinforcement training on the part of Zoo Atlanta's Primate Team.



Ozzie slides his arm into the durable, yet comfortable, Gorilla Tough Cuff. As the cuff inflates, Ozzie's blood pressure is measured and displayed on a monitor. Credit: Zoo Atlanta

One of four geriatric gorillas living at the Zoo (the others are Shamba, 50; Choomba, 48; and Ivan, 47), Ozzie is at an age where he may be subject to health concerns similar to those experienced by mature humans. Cardiac disease is the leading cause of mortality in adult male gorillas living in captive settings, and the new system will enable veterinarians to more effectively monitor precursory signs such as high blood pressure.

"This is a great step forward in the medical management and care of captive [gorillas](#)," said Dr. Sam Rivera, Associate Veterinarian at Zoo Atlanta. "Our Veterinary and Primate Teams are extremely fortunate to

have the biomedical engineering department at Georgia Tech and Emory University as a resource."

The Gorilla Tough Cuff has already been demonstrated for veterinarians and animal care professionals from numerous other accredited zoos. The device could ultimately prove invaluable to the more than 100 institutions around the world currently housing the species.

Source: Georgia Institute of Technology

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