

Biotelemetry: An Overview

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EDITORIAL

The calculation of biological parameters across a long distance is known as biotelemetry. Bio-telemetry, to put it another way, is an electrical technique for transmitting biological data from a living being to a location where it may be monitored and recorded. Bio-telemetry is often referred to as radio telemetry since it involves the modulation of a radio frequency carrier. Reptiles have had biotelemetry units implanted in them for a long time. Telemetry is derived from the terms tele, which means "remote," and metron, which means "measure." Telemetry is a term used in medicine to describe the process of collecting and displaying a patient's vital signs in a central area for healthcare providers to analyse. Telemetry units are now smaller, cheaper, and have higher and longer transmission powers than previous implants. Similarly, receiver modules are smaller, easier to operate, less expensive, and far more sensitive than they have ever been.

A variety of telemetry units, as well as guidance on which unit to use, experimental design, and biotelemetry in specific species, are available from a number of reputable commercial sources. Biotelemetry experiments in animals raise a slew of ethical concerns. The most obvious worry is the impact of these kinds of experiments on the animals involved. It's important to remember to "first do no harm." Nonetheless, biotelemetry's short- and long-term effects on the animals investigated can have far-reaching consequences. Before conducting such research, the potential for dangers must be thoroughly considered. The value of the data gathered through telemetry studies must be so great for the species being researched that the net result significantly surpasses the risk to the animals.

Hopefully, such research contributes significantly to our knowledge and understanding of a species, as well as to our efforts to safeguard

it. Biotelemetry units must prioritise the animal's well-being, have a solid experimental design, and ensure that the data obtained is scientifically accurate and not corrupted by the researchers' actions or biases. Biotelemetry, when used correctly, is a valuable tool for learning about a species' physiology, behaviour, and natural history. Biotelemetry is most commonly used in specialist cardiac care telemetry units or hospital step-down units. Although almost any physiological signal can be relayed, applications are mainly limited to heart monitoring and SpO₂. Biotelemetry is increasingly being used to study animals and wildlife by monitoring their physiology, behavior, and energy levels from a distance. It may be used to study how animals migrate, as well as the environment they are in, by measuring abiotic factors like heart rate and temperature, and how this affects their physiological status by measuring biotic variables like heart rate and temperature. The forms of transmission for the devices are based on the environment in which the animal travels.

Telemetry systems can be mounted externally to animals or inserted internally, with the types of transmission for the devices depending on the environment in which the animal moves. For example, radio or ultrasonic broadcasts are frequently employed to monitor the movement of swimming creatures, while GPS and satellite transmissions can be used to follow land-based or flying species. Biotelemetry devices were originally used during the early space race, when physiological signals from animals or human passengers were sent down to Earth for examination (the name of the medical device manufacturer Spacelabs Healthcare is a reflection of their start in 1958 developing biotelemetry systems for the early U.S. space program). Since at least the 1980s, animal biotelemetry has been employed. Animal biotelemetry has progressed to the point where it can now be used to study not only the physiology and mobility of free-ranging animals, but also how various animals interact, such as predators and prey.

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