**Static and dynamic modeling of the operating point of the arterial baroreflex.**

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Arterial baroreflex operates by reflexively altering autonomic neural outflow to adjust heart rate, stroke volume, and total vascular conductance. Their function has been studied in a wide range of animal models using several invasive and direct techniques such as: i) surgical isolation of arterial vessels housing baroreceptor populations; ii) direct electrical stimulation of baroreceptor afferent fibers; or iii) surgical denervation of baroreceptor afferent fibers. This animal research has facilitated a more complete understanding of the mechanisms by which both the carotid and aortic baroreceptors modulate cardiovascular hemodynamics at rest and during exercise. However, for obvious ethical and technical reasons, implementation of these experimental strategies employed in animal research is not feasible in humans. As a result, less invasive techniques have been utilized to perturb the baroreceptors in an attempt to evaluate baroreflex function. The methodologies used in human studies will be presented in this lecture and include the infusion of vasoactive drugs (i.e., the Oxford technique), the variable pressure neck collar, and several dynamic or spontaneous measures of arterial baroreflex sensitivity. Most of these methodologies use simple linear regression or linear dynamic analyses models of input and output responses. However, the variable pressure neck collar technique utilizes logistic function modeling and is especially significant in identifying baroreflex resetting. The primary focus of this lecture will be on the methodological interpretation of each analysis technique and the advantage or disadvantage of each technique for evaluating the physiological response to the arterial baroreflex.