Pharmacology of the autonomic nervous system

Learning Outcome Objectives

Upon successful completion of this lesson, you should be able to:

1. Discuss how the parasympathetic and sympathetic divisions of the autonomic nervous system alter the activity of organs and tissues given in the examples.
2. Identify the neurotransmitters released in the autonomic ganglia as well as at parasympathetic effector and sympathetic effector junctions, and the receptors on which they act.
3. Predict the likely effect of drugs that interact with the autonomic nervous system on select organs and tissues.
4. Discuss the therapeutic uses and potential side effects of nicotine and autonomic ganglion blockers.
5. List the subtypes of the adrenergic and muscarinic receptors, identify organs in which they are found, and discuss how activation of the specific receptor subtype affects those specific organs.
6. Discuss the therapeutic uses and potential side effects of adrenergic receptor agonists and antagonists.
7. Discuss the therapeutic uses and potential side effects of muscarinic receptor agonists and antagonists.

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Brian Cairns is an associate professor and Canada Research Chair in Neuropharmacology at the Faculty of Pharmaceutical Sciences, University of British Columbia (UBC), Vancouver, where he teaches undergraduate pharmacology. His research interests include the examination of sex-related differences in musculoskeletal pain mechanisms, and the identification of receptors within muscles and joints that may contribute to the development of non-inflammatory pain.

Expert Reviewer: Kerry Wilbur, B.Sc.Pharm., ACPR, Pharm.D.
Kerry Wilbur is an assistant professor of pharmacy at Qatar University. She is a former clinical pharmacy specialist in internal medicine at Vancouver General Hospital, and a former clinical associate professor of pharmacy at UBC. In addition to determining and monitoring the appropriate use of autonomic drug therapies for patients in her hospital practice, she has been involved in developing the autonomic pharmacology module for paramedical professionals training at the Justice Institute of British Columbia, as well as delivering this educational content to first-year pharmacy students in Qatar.