

**Parallel Workshop:  
NEUROMODULATION IN CARDIOLOGY**

**The cardiac neuronal hierarchy as a potential target for SCS**

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**Abstract:** The cardiac neuronal hierarchy can be represented as a redundant control system made up of spatially distributed cell stations comprising interconnecting neurons that are located in intrathoracic ganglia, including those on the heart, and the central nervous system. Neurons distributed throughout this hierarchy interconnect via specific linkages such that each neuronal cell station is involved in temporally dependent cardio-cardiac reflexes that control overlapping, spatially organized cardiac regions. Its peripheral components are in constantly communication with one another in, for the most part, a stochastic manner. During altered cardiac status, this redundancy of function normally represents a stabilizing feature. In the presence of regional myocardial ischemia, some intrinsic cardiac neurons may undergo pathological change that can alter its spatially and temporally dependent reflexes. It is proposed that when populations of intrinsic cardiac neurons undergo pathology, some may act in isolation to destabilize efferent neuronal control of regional cardiac electrical and/or mechanical events. It is further proposed that increasing inputs from thoracic spinal cord neurons may overcome such untoward events by stabilizing transduction of regional ventricular ischemia within the intrinsic cardiac nervous system. This, in turn, can result in a reduction in arrhythmia formation and even infarct size. (Supported by the Canadian Institutes of Health Research)