

<b>Session 2</b>	Thursday, Oct 5 <sup>th</sup> 11:00-11:30 AM	<b>Quantifying ischemia through QRS changes</b> Co-chairs: Jocelyne Fayn and Martin Ugander
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### **High frequency QRS changes in intracardiac electrograms of acute and chronic porcine ischemia models**

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High frequency QRS (HFQRS) of surface ECG has been shown to be an excellent marker of ischemia. Very few studies have been done on the high frequency band of intracardiac electrograms such as those that are measured in implantable devices. In a preclinical study, high frequency electrograms were recorded from standard intracardiac electrodes in typical locations (RV, RA and LV) in order to analyze the response of HFQRS to ischemia in porcine models. We have used two distinct models – acute and chronic. In the acute model, ischemia was induced in an anesthetized pig by inflating a balloon in one of the coronary arteries. In the chronic model a copper plated stent was placed in the LAD artery and the conscious animal was monitored for several weeks while the stent gradually became occluded.

The results of the acute model demonstrated a clear reduction in the amplitude of the HFQRS during balloon inflation. The response preceded the change in ST segment and in very short occlusions, was the only indicator of ischemia.

In the chronic model, the HFQRS signal was more sensitive to the developing ischemia after the copper plated stent was introduced and was also more stable compared to the ST segment level. Two effects were noticed in the HFQRS of an ischemic animal: the amplitude decreased in periods of high heart rate (stress test) and the average amplitude on a day-to-day basis also decreased according to the progression of the disease. These HFQRS changes were noticed several days before an acute MI occurred.

These results could pave the way for a new paradigm in the use of pacemakers and other implantable devices. Early detection of the onset of ischemia and reliable acute MI alerts are the foundations for treatment optimization and ultimately, myocardial salvage.