Acute Deep Pain Detection utilizing Heart Rhythm Analysis

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• The aim of anesthesia is to minimize pain experienced by the patient during surgery.

 Our aim is to detect pain in 2 stages of surgery – intubation and the first abdominal cut using HR analysis.

Methods

• 21 healthy surgical patients underwent anesthesia for laparoscopy in different indications.

• ECG monitoring from the intubation time to the first abdominal cut was analyzed using the Wavelet, the Fourier transformations and the Orthogonal Matching Pursuit.

Results

1. INTUBATION











Results

2. FIRST ABDOMINAL CUT









Conclusions

- We can detect acute changes in HR in correlation to painful events during surgery. Both during intubation & the first abdominal cut.
- Not all patients experience a physiological response to painful stimuli.
- These changes could give us insight to whether pain is perceived by the patient undergoing anesthesia.