Implementing Computerized ST-Segment Analysis Utilizing 5-Lead ECG Cables during the Perioperative Period for Myocardial Ischemia Detection in Patients at Risk for Cardiovascular Disease

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Abstract
Cardiovascular disease (CVD) is one of the leading causes of death in the United States (U.S.) annually (Centers for Disease Control and Prevention, 2011). Mississippi has a disproportionately higher percentage of citizens likely to have CVD (Mississippi State Department of Health [MSDH], n.d.). The numerous stressors related to surgery are alone enough to increase the demand of the heart and lead to ischemia of the myocardium. Surgical stressors combined with preexisting CVD can exponentially increase the risk of ischemia. It is estimated that over a third of all surgical patients have ischemic heart disease. Puelacher et al. (2015) reported 40% of deaths after noncardiac surgery are attributable to cardiovascular (CV) complications and myocardial ischemia/infarction in particular. The most specific and gold standard of monitoring for such ischemia is the ST-segment on the electrocardiogram (ECG).

An informal survey of anesthesia providers at several hospitals in Mississippi revealed that they did not place 5-lead ECG cables on patients at risk for CVD the majority of the time. A quality improvement (QI) educational project was prepared from the most recent literature and presented to anesthesia providers at a Southeastern hospital (N=12). The pre-survey percentage of 5-lead versus 3-lead ECG cables was determined and compared with the reported percentage of use after the presentation. The percentage of 5-lead ECG cable use before the intervention was 8.1% and post intervention was 30.5%, an obvious increase. The main barrier reported by anesthesia providers was not having the 5-lead ECG cables readily available. The most important factor for choosing to use the 5-lead ECG was a patient history of CVD. By updating the anesthesia providers on the most recent literature and guidelines by numerous professional organizations, the primary goal to increase the utilization of 5-lead ECG cables was met.