

## **The Impact of Alertwatch<sup>®</sup>, a Multifunctional Decision Support System, on Intraoperative Process Measures and Postoperative Outcomes**

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**Background/Introduction:** We hypothesized that AlertWatch<sup>®</sup>, an intraoperative multifunction alerting decision-support system, may improve clinical process measures and postoperative outcomes.

**Methods:** AlertWatch<sup>®</sup>, a FDA-cleared alerting and decision support system, was evaluated in a six-year single-center observational study of surgical patients at an academic medical center, Figure.<sup>1,2,3</sup> Electronic record data were compared for a 22-month period prior to implementation (historical control group) and a four-year period after the implementation (parallel control group). Use of the system was at the discretion of the anesthesia provider. Inclusion criteria were adults under general anesthesia, advanced medical disease, surgical case duration  $\geq 60$  minutes, and inpatient length of stay  $\geq$  two days. The process measures were adherence to accepted intraoperative process measures (avoidance of intraoperative hypotension, ventilator tidal volume  $\leq 10$  ml/kg, and crystalloid administration in ml/kg/hour).<sup>4,5</sup> The outcome measures were occurrence of postoperative complications (myocardial ischemia, acute kidney injury, or 30-day all-cause mortality) and resource utilization (length of stay and hospital charges).

**Statistical Analysis:** Univariate analyzes (Mann-Whitney U test and Pearson Chi-Square) were used to determine statistical significant associations for process of care measures and non-risk adjusted outcomes between experimental cases and controls. Risk adjusted analyzes were performed to determine if AlertWatch<sup>®</sup> use was independently protective for minutes of hypotension, length of stay, myocardial ischemia, acute kidney injury, and 30-day all-cause mortality using either linear or logistic regressions as appropriate. A p-value of  $<0.05$  was considered statistically significant.

**Results:** 27,109 patients were evaluated: 8,046 experimental cases were compared to 11,055 parallel and 8,008 historical controls. All process measures were improved for both control groups. For historical controls all outcome measures significantly improved. For the parallel control group myocardial ischemia was reduced (2.1% to 1.5%) as well as median hospital length of stay (6 days to 5 days) and hospital charges by \$3,471 although acute kidney injury and 30-day all-cause mortality were not significantly reduced.

**Conclusion:** The use of AlertWatch® during general anesthesia in adults was associated with improved process and outcome measures including myocardial ischemia, hospital length of stay, and hospital charges.

**References:**

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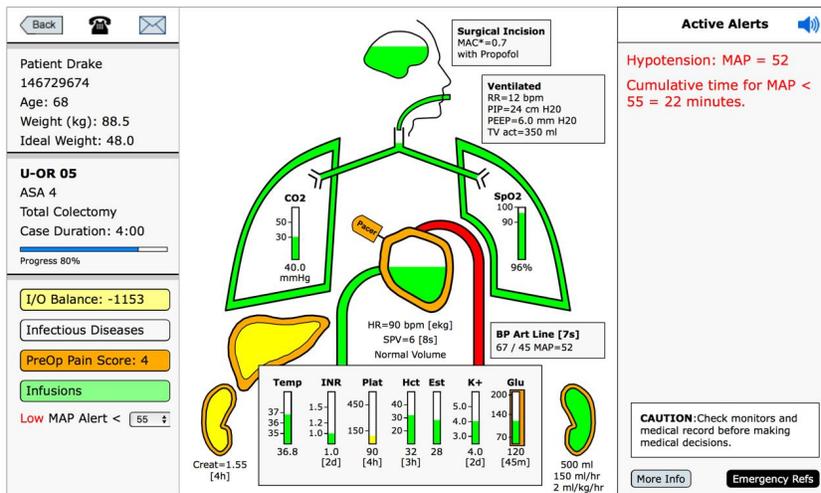


Figure. The aortic arch is red (the mean arterial pressure is <55mmHg and there is a red text alert), in addition there is a red text noting the cumulative time the mean arterial pressure has been <55mmHg (in this case 22 minutes).