

## Quality: Taking Action When It Matters

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### **Background/Introduction:**

Quality measures are used throughout the medical continuum to improve outcomes, prevent injuries, reduce costs, and optimize reimbursement. In anesthesia care, quality measures guide clinicians to perform actions that are known to positively impact safety, and patient outcomes. Typically these actions are easy to perform, but can be overlooked as the anesthesia team focuses on guiding the patient through a successful procedure. Unfortunately, an anesthesia provider's feedback from quality measures related to their anesthetic tends to occur long after the procedure is complete, when recognition of a missed intervention can no longer contribute to patient care delivery or affect reimbursement.

Recognizing the importance of closing this gap, we developed the Clinical Optimization Reasoning Architecture (CORA) application, which can provide intraoperative quality measure guidance. CORA is a standards based clinical decision support application, which collects and analyzes data during a procedure. The application can determine eligibility for a set of quality measures, and provide recommendations to perform corrective actions during the intraoperative period. This ability to provide intraoperative quality measure status can substantially improve provider compliance, patient care and reimbursement.

### **Methods:**

Five high-value quality measures were chosen from the Anesthesia Quality Institute's NACOR registry [1], translated into production rules, and imported into CORA. We then extended CORA to communicate with the Draeger Innovian<sup>®</sup> [2] anesthesia information management system (AIMS). This enables the continuous evaluation of the measures, based on patient information and near real-time sensor data. Results in the form of alerts, and recommendations, are presented to the care team via a JavaScript flyout tab that runs alongside the AIMS system.

Figure 1 illustrates CORA's high-level architecture and data flow.

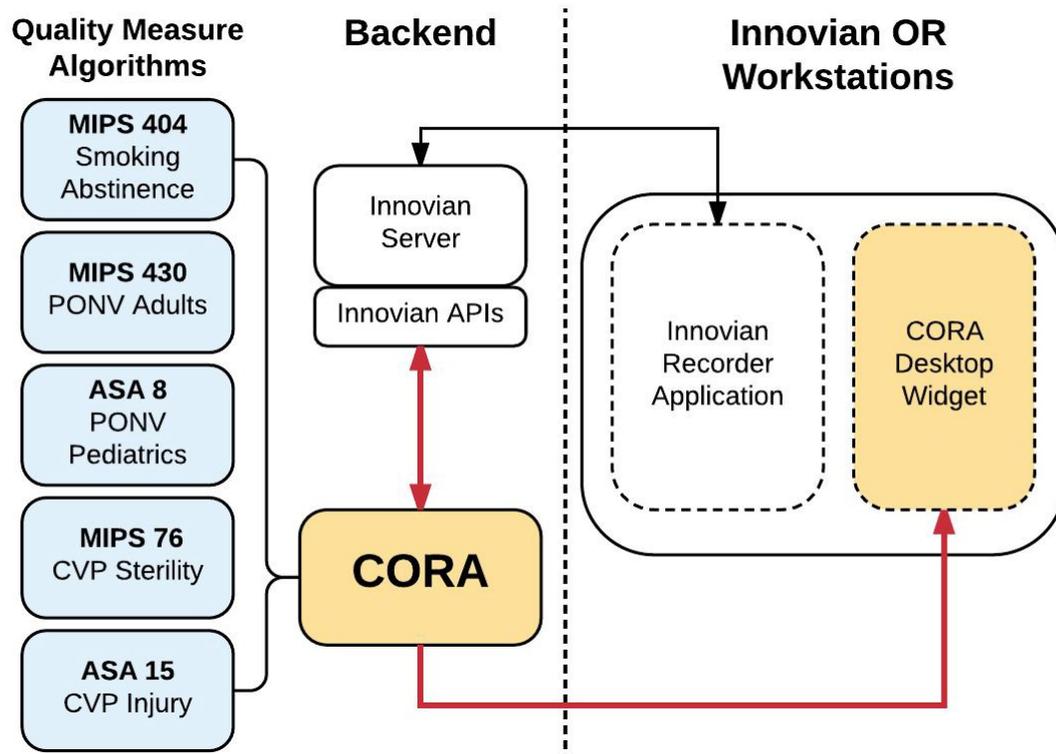


Figure 1. Continuous integration of quality measures with the Innovian<sup>®</sup> anesthesia platform through CORA. Five quality measures defined in NACOR were translated from narrative form into production rules. These rules are then executed in the CORA clinical decision support application, which continuously evaluates data in near real-time, and provides guidance to ensure measure goals are achieved.

### Conclusions:

Working with the anesthesia staff at Magnolia Regional Health Center (12 ORs with an annual case load of 11,000) to identify and prioritize key quality measures, we implemented a system to continuously reason over data from individual anesthesia information management system instances, allowing up to 12 cases to be simultaneously active. The context-aware front-end was synchronized with the specific patient/case running on an Innovian<sup>®</sup> OR workstation to provide the anesthesia staff at Magnolia Regional Health Center with near real-time, intraoperative quality measure status, enabling impact *before* the patient leaves the OR.

### References:

[1] "AQI - Anesthesia Quality Institute," 12-Dec-2017. [Online]. Available:

<https://www.aqihq.org/introduction-to-nacor.aspx>. [Accessed:12-Dec-2017].

- [2] "Innovian® Anesthesia," 12-Dec-2017. [Online]. Available: [https://www.draeger.com/en-us\\_us/Hospital/Products/Clinical-Information-Systems/Innovia n-Anaesthesia](https://www.draeger.com/en-us_us/Hospital/Products/Clinical-Information-Systems/Innovia-n-Anaesthesia). [Accessed: 12-Dec-2017].