

Gestalt Operating Room Display Design for Perioperative Team Situation Awareness

Fuji Lai and Gabriel Spitz, Aptima, Inc., Woburn, MA
Philip Brzezinski, LiveData, Inc., Cambridge, MA

The Challenge

The perioperative environment is a complex, high risk environment that requires real-time coordination by all perioperative team members and accurate, up-to-date information for situation assessment and decision-making. There is the need for a “Gestalt” or holistic awareness of the perioperative environment to enable synthesis and contextualization of the salient information such as: patient information, case and procedure information, staff information, operative site view, physiological data, resource availability.

The Solution

Our solution is to augment the medical toolkit with a large screen wall display that integrates and makes accessible information that currently resides in different data systems and care providers. The objectives of this display are to provide information that is organized to promote safe workflows, content that facilitates team coordination and communication, enables anticipation of events, and supports information flow from upstream to downstream care providers. Using human factors engineering design principles and methods, essentially a work-centered design process, we developed a display that provides a common operational picture for the entire perioperative team and promotes situation awareness to enhance patient safety.

The screenshots illustrate the integration of various data sources into a single, cohesive interface. Key features include:

- 1. Patient Overview:** Patient name (Claus, Santa V.), age (78y), weight (84 kg / 185 lbs), MRN (21356754), and isolation status (Strict).
- 2. Staff & Anesthesia:** Lists nursing staff (Almira Warner, Magnus Kline, Lance Gadow, Greta West, Christy Eckhard) and anesthesia team (Nelson Goldvogel, Kelvin Friedline, Stacey Graham, Mirabelle Peters).
- 3. Physiological Data:** Real-time monitoring charts for Heart Rate (HR), SpO2, Blood Pressure (BP), Central Venous Pressure (CVP), and Body Temperature. Includes Urine Output and Tissue Weight data.
- 4. Case Report & Procedures:** Detailed notes on medications, PACU assignment, and planned procedures like Radical Resection Neuroplasty and Brachytherapy.
- 5. Final Integrated View:** A comprehensive dashboard with a 'Create Report' button for documentation.

- Benefits:**
- ✓ Promote safety protocols, procedures, workflow
 - ✓ Promote information consistency and quality
 - ✓ Promote collaboration and team orientation
 - ✓ Promote communication, dialogue, speaking up
 - ✓ Promote backup and monitoring
 - ✓ Promote information visualization
 - ✓ Enable trending, multiparameter diagnosis
 - ✓ Enable prediction and anticipation of events
 - ✓ Provide immediate update and historical account
 - ✓ Enable teleconsultation
 - ✓ Facilitate handoffs
 - ✓ Enable information flow downstream
 - ✓ Enhance productivity and efficiency