

MERGE Solutions in Partnership with Vuzix

Bringing a Remote Medical Device Rep Solution to the OR

Challenge

During surgery, a Medical Device Rep (MDR) plays a critical role in completing efficient and competent Operating Room (OR) operations. They are needed both to ensure the correct trays and devices are present on a case-by-case basis, as well as to provide insight to the Scrub Techs on moment-by-moment surgery needs. Despite MDR's critical function, their physical presence is somewhat problematic. MDRs provide their consulting services for only a small fraction of the surgical time, and yet surgery cannot start without them being engaged. MDR's requirement for physical attendance can lead to delayed starts, higher infection rates, and overall inefficiencies in the OR.

In surgery, the doctor relies on Surgical Techs (referred to as Scrub Techs), to manage medical devices and tools in surgery. The Scrub Tech hands tools to the surgeon while the MDR advises the Scrub Tech on which instrument is needed next, in a precise and timely manner. This process is critical to running a smooth operation in the OR. The Scrub

Tech, who often is not an expert with all the many uses, sizes, and varieties of medical instruments arrayed to choose from, looks to MDRs to consult them on the individual selections, providing them with insight into what might be needed next. Because of this, it's crucial that MDRs can observe surgeries, in real-time, with an uninterrupted view, to best assist the surgeon by arming the Scrub Tech with the right tools for the procedure.

Unfortunately, Medical Device Reps can add complications as well. They're yet another person on the surgical team, sometimes hindering OR operations by delaying start times due to their expertise being in high demand. As a living, breathing person, the Medical Device Rep may also introduce bacteria into the OR simply by being present. The post-operative infection rate impact comes from "door swings". Every time the door opens, the sterile environment is violated. The Medical Device Reps are high contributors to door swings in the OR.



"...it's crucial that MDRs can observe surgeries, in real-time, with an uninterrupted view, to best assist the surgeon..."

Goals

MERGE Solutions' immediate goal is to deploy current video conferencing and smart glasses technology to provide critical consulting, provided by remote MDRs. This advancement improves on-time starts, reduces OR turnover times, and improves the quality of consulting to the OR by the MDR.

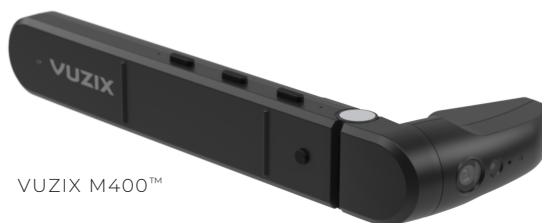
With this technology, MERGE also leverages Augmented Reality (AR) and on-demand information that the MDR can route into the eye screen of the smart glasses to assist the surgeon and the Scrub Tech. When the OR becomes a sterile environment, the doctors and OR Staff are isolated and must count on their own knowledge and data while in surgery. MERGE enables the MDR (or other medical staff) to introduce images, solutions, data, video clips, and more, to the medical team so they are not isolated while in the OR.

The MDR becomes a virtual participant who, observing the surgery through the lens of the smart glasses worn by the surgeon, has a bird's eye view of the surgical field to improve overall practices within surgery. With the right tools and augmented reality (AR) infrastructure in place, the remote Medical Device Rep can better support the surgeon and Scrub Tech, leading to:

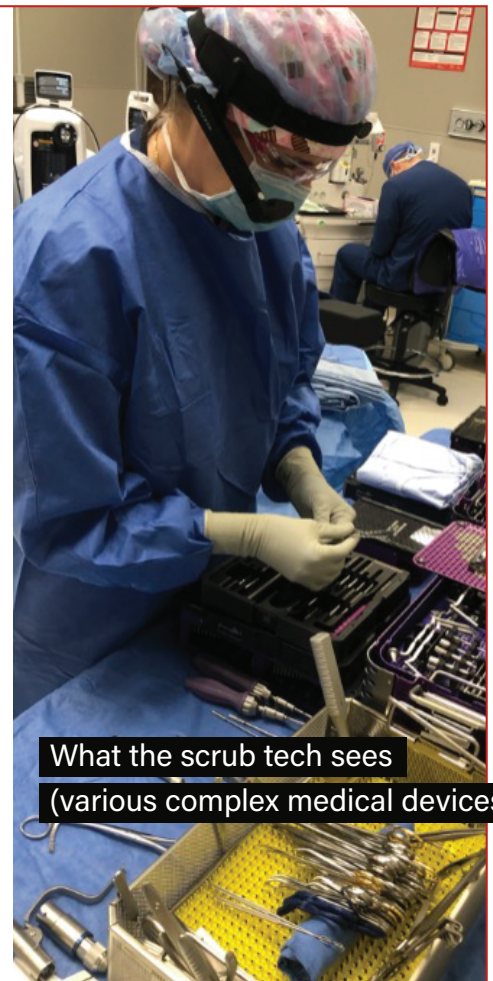
- **Decrease in delayed start times**
- **Decrease in the number of door swings into the OR, which may lead to decreased post-operative infection rates**
- **More efficient surgeries**
- **Lower operating costs**

Solution

MERGE Solutions partnered with Precision Surgical Center (Michigan), led by Dr. Christopher Zingas, an orthopedic surgery specialist, to test their solution. Both the doctor and Scrub Tech are equipped with a pair of Vuzix M400 smart glasses during surgery, with the remote Medical Device Rep tuning in via conferencing app. This configuration gives the remote MDR simultaneous, real-time access to both the surgical field and the surgical tech's view, in particular the tray of medical devices and instruments. In addition to the video feed, the remote device rep also has direct audio connection with all parties in the OR and can speak directly to the Surgical Tech and advise them on what the surgeon will need next. By leveraging Vuzix hardware, MERGE Solutions now offers a seamless solution to address OR efficiencies.



VUZIX M400™



What the scrub tech sees
(various complex medical devices)

Results as of 2023

- MERGE Solutions has run 280 cases using smart glasses technology.
- MERGE has included three (3) surgeons, twenty (20) Scrub Techs and five (5) Medical Device Reps, in this yearlong development period.
- Software and remote procedures have been developed and refined to improve OR efficiencies, improve consulting quality, and reduce at least one (1) person from the OR.
- By removing the MDR from the OR, OR occupancy was reduced by 17%
- The MDR's involvement is required (a) before surgery, (b) during a specific period of the surgery and (c) after surgery. Therefore, the MDR needs to be available during the entire surgery, with their active involvement ranging anywhere from 20% to 40% of the actual surgical time.



By removing the MDR from the OR, OR occupancy was reduced by 17%

- The MDRs involved with MERGE surgeries have been able to provide excellent consulting services, while active in other cases, stationed at other hospitals, or even on the road to other surgeries.
- MERGE has introduced a digital record of implants used during surgery. Before MERGE, the recording of implants consumed during surgical procedures was tabulated with pencil and paper and handed to the Charge Nurse. MERGE has implemented a digital record of implants consumed and is recorded as part of the digital record of each case. These records are synchronized with the doctor, the hospital, and the medical device company, for accurate and expedient invoicing.