Integrated medical technology may ease Ebola's complicated procedures

As health care workers across the country prepare for the possibility of treating a patient with Ebola, an MGH research team is working hard to rapidly identify technology-based solutions to support Ebola care.

"If we can avoid entering the patient's room unnecessarily, we can reduce the risk of exposure to the caretaker, and with remote control devices we can respond more quickly to the patient's needs," says Julian M. Goldman, MD, of the MGH Department of Anesthesia, Critical Care and Pain Medicine, director of the MGH Medical Device Plug-and-Play (MD PnP) program and medical director of Partners Biomedical Engineering.

In response to a request from a White House official, Goldman and MD PnP staff quickly assembled a team from government agencies and companies including General Electric, Qualcomm, Covidien and DocBox, many of whom have collaborated with Goldman in the past. During a three-day hackathon – culminating with a demonstration on Nov. 6 – the team used MD PnP's open-sourced integrated clinical environment ([OpenICE]) platform to show ways in which medical sensors and control devices can share data in quarantine situations and remote controls can make intensive care units safer. Researchers demonstrated a cornucopia of interoperable technologies – including a remotely controlled ventilator system, a patient storm tracker designed to display patterns of a patient's illness and a smartphone app created to remotely monitor vital signs.

"This is another piece of the puzzle," says Tracy Rausch, CEO and founder of DocBox. "We have created a way to run applications that move data across

the hospital to protect caretakers and provide safer care to patients. It's like an iPhone, but for the health care industry."

Says Brian Russell, vice president of Business Development Wireless HealthCare at Covidien,"Caring for a patient with Ebola requires constant monitoring. As part of this lab demonstration, we have integrated wireless vital sign monitoring through the OpenICE platform allowing clinicians to see and analyze an enormous amount of data."

According to Goldman, data integration and remote control of medical devices have long been stymied by liability concerns and regulatory scrutiny, but the Ebola response has opened a window. With the backing of federal agencies like the Food and Drug Administration (FDA), prototypes may soon become possibilities.

"We are the only program of its kind in the world," Goldman says. "We are setting the stage for the 'medical Internet of things,' where medical devices are interconnected and information is openly shared. The power of a community is much stronger than that of a single product."