

All-in-One Medical AI PCs Meet Healthcare Computing Needs

In the healthcare industry, there are companies that build medical equipment and providers that use these machines and devices. While the business models of these two groups are completely different, they are guided by the same challenges and opportunities. Both are eager to deploy the latest technologies but are faced with strict regulatory requirements and short product life cycles.

A traditional medical device is designed with data residing locally on the device. With the increasing demand of interoperability within healthcare facilities, healthcare professionals can improve efficiency effectively with AI-enabled medical PC solutions designed to sustain the mission-critical environment and process patient data throughout the treatment process.

Managing all these constraints is a tall order, but today's medical computers are up to the task. Hygienic, compact, and portable, medical-grade AI computers can be used by practitioners throughout hospitals and clinics. And high-performance processors enable near-real-time AI analytics, helping doctors and nurses make faster, better-informed diagnostic and treatment decisions.

Keeping Up with AI Innovations in IoT Medical Devices

Edge AI and computer vision have become increasingly important to today's imaging and patient monitoring machines, which can swiftly analyze data and support physicians with diagnoses. But for medical device development, incorporating these cutting-edge capabilities can be a struggle. Medical device development takes on average from eight to 24 months to implement

hardware and software design changes in accordance with regulations, and another two to three years to obtain certification via clinical trial.

"They don't have the luxury to continuously upgrade to the latest technology," says [John Chuang, President of Onyx Healthcare, Inc., a Taiwan-based global producer of medical PCs and hospital IT solutions.](#)

And once those finished medical devices are released, they need to stay in service for a long time. Hospitals have a complex mix of technology, and don't usually upgrade their equipment for 10 years or more—an eternity in the fast-moving world of medical AI and computer vision development.

To keep machines as up-to-date as possible, Onyx collaborates with medical device companies, hospitals, and Intel, which supplies the processors for the all-in-one (AIO) medical computer the company produces for hospitals and clinics. Intel high-performance processing power is the key that enables software to run edge AI analytics.

Working closely with Intel, Onyx can provide a scalable custom design that allows medical device companies to incorporate the latest processors into its medical-grade computing technology. "By providing the latest technology to medical OEMs and ODMs, we help them keep a step ahead, so they don't have to worry their technology is outdated by the time their devices are launched," Chuang says.

Delivering Machine Information Where It's Needed

In hospitals, medical devices are part of an elaborate symphony that requires precise timing and coordination.

Doctors rely on information from many sources to diagnose and treat patients, including medical records and lab results, blood pressure and oxygen monitors, and images from X-ray, CT, and ultrasound scanners. But since these machines are made by different manufacturers and use different software protocols, they typically don't connect with one another—or with hospital IT systems. As a result, doctors often must examine disjointed patient data.

A system like the Onyx AIO medical AI computer serves as a symphony conductor, integrating data from all sources—including patient records and off-site machines. It enables the transmission of high-resolution images and the performance of AI analytics, giving doctors a comprehensive, near-real-time view of a patient's condition.

“The data transmitted is informative enough for physicians to make sound, timely treatment decisions. That's especially crucial for patients in critical care, and in situations where the doctor needs to determine whether surgery is required,” Chuang says.

The ONYX AIO AI computer is also designed to meet hospitals' rigorous sanitary requirements. For example, instead of using a fan for cooling, it uses an onboard heat sink, creating a closed system that won't transfer germ-carrying air into hospital corridors or patient rooms. “We are able to use a fanless design because of the efficiency of low-wattage Intel processor technology,” Chuang says.

Medical IoT in Action: Mobile Nursing and Telehealth Solutions

Connecting patient information via medical computers can help hospitals and clinics achieve greater interoperability. That's an important goal for the CAIH, a French government alliance formed to consolidate technology requirements across the country's hospital networks. Onyx developed two solutions to help the organization achieve its objectives.

The first is mobile nursing stations—carts containing an AIO AI computer that nurses can bring on their rounds.

The medical computer enables them to keep an eye on every patient under their care as they go from room to room. In addition to keeping nurses apprised of patients' vital signs, the AIO helps monitor equipment, letting nurses know, for example, if an IV is running low on fluid.

AI monitoring helps short-staffed hospitals better attend to patients' needs, Chuang says. It also helps them deal with the fast-growing use of telehealth. In a second solution it developed for the CAIH, Onyx enables AIO computers to connect doctors with patients, caregivers, and medical equipment at remote facilities—including skilled-nursing homes, where a physician may not be present.

Doctors can view patients from their own AIO computer and guide nurses in using medical instruments, such as portable ultrasound machines or scopes for examining the ear, nose, throat, or skin. Devices are equipped with high-definition cameras that relay medical-grade images to the doctor.

“With this information, physicians can do some diagnostics and quickly determine whether a patient needs to come to the hospital right away,” Chuang says. Otherwise, many would have no choice but to be transported there—often a challenge for those in a skilled-care institution.

Onyx AIO computers are also enabled for 5G communications, allowing remote facilities with a 5G network to relay alerts for patient vital data or slip-and-fall accidents directly to doctors or nurses, instead of waiting for the information to be processed in the cloud.

Building Future-Ready Technology

As AI capabilities expand, medical computers are assuming a greater role in patient care. But to stay useful, they must evolve along with the machines they connect with, Chuang says.

“Medical computers need to become more like medical devices themselves. We're seeing greater demand for them to interface with specialized machines, and demand for data processing speed is also increasing. By building the latest Intel technology into our computers, we are able to satisfy those needs,” Chuang adds.