

Implementing a New Hardware Deployment in a Healthcare Setting:

5 Questions Every CIO Needs to Answer



Introduction

Careful consideration of the computer hardware deployment in a medical facility is key to ensuring money-affecting decisions are the right ones. A CIO must provide the proper information to the powers that be so money spent is money well spent. The wrong path of financial decisions affects the bottom line, and in turn can cause a loss of patient satisfaction, lower retention rate, or perhaps worse—HIPAA violations or patient injury. Consider the points presented here as guidelines to follow when faced with decisions that could affect the long-term operations for your hospital or clinic.

This document contains several key points when evaluating PCs for their medical use listed here in the form of questions. These points are grouped into short chapters and include detailed information about considerations with full medical computer deployments. Any PC that is considered for medical use should be evaluated against this questionnaire.

Are there Special Requirements and Does the Computer Meet or Exceed Them?

Different hospital environments require a range of standards—operating rooms need computers with sterile designs that safeguard against spreading airborne microbes, dust, germs, and pathogens. A groundwork required for medical use lays the foundation for the housing design, the

disbursement of heat, the component selection, and the standards defined by the FDA. This is to ensure the highest safety standards for medical computers when interacting with patients, medical staff, or any other individuals that can potentially carry infections and turn medical staff into patients too.

Sealed and Rated for Everyone's Protection

The best practice in selecting a medically-clean computer is to start by ensuring the computer housing build is of an antimicrobial design, with resin injected into the plastic that wards off infections, microbes, and pathogen growth. The housing must have a sealed front bezel with an Ingress Protection (IP) rating of 65. With this rating, you can spray directly onto the computer screen without risk of damaging its internal components. The 65 rating protects against foreign object ingress from dust and no liquid ingress from direct nozzle sprays and splashes. Combined with the anti-microbial housing, these build factors are necessary for any computer deployment in a medical facility to keep infections low and ensure the safety for all individuals.

Fanless Means Cleaner and Quieter

Does your computer deployment feature fanless builds? Since heat is a factor in a fanless design, the computer requires components that function at lower powers—a Skylake processor running at 15 watts will produce less heat than at higher wattage, just enough so that a fanless heat dispersion system, like an aluminum or copper heatsink, will be

effective enough without bringing harm to the system or the patient. Another component to examine is the hard drive—solid state drives feature no moving parts for cleanliness, quiet operation near the patient, and higher speeds than traditional hard drives. These are built in mind to keep the patient secure and happy. Loud computer fans that start at 3 AM aren't ideal choices to keep a patient's mood elevated.

Certified for Near-Patient Use

How close will the medical computers be to the patients? Individual patient safety is foremost when using a computer in close proximity. The FDA calls for the EN-60601-1 standard for use of medical devices near patients. These are standards set by the International Electrotechnical Commission, ensuring that a vast majority of medical computers and devices operate with certain thresholds of electrical and radioactive exposure to the patient. The standards address computer verification, design methodology, risk and safety assessment for patients and staff, and other factors. Be sure to research what standards your computer deployment meets.

Ease of Access in Mind

Will staff and patients need to access the computer? If the answer to that question is a yes, the computer must be easily accessible by all parties. A necessary feature for the computer is a VESA mount, or Video Electronics Standards Association mount, to keep the computer free of clutter and accessible for many. It's a common standard for a lot of televisions, monitors, and computer workstations on wheels. A VESA-mountable medical

computer must have a touch-screen, either resistive or capacitive in design, for supreme mountability and accessibility reasons—it's likely the case that if a computer is mounted on an extended arm, it won't have space for a keyboard and mouse. Ensure your computer deployment has this option available.

"Always On" Healthcare

One last important design factor is the constant uptime that a medical computer needs. Technology is at the whim of demanding healthcare. Ensure your computer deployment can meet the 24/7 demands of "always on" healthcare. Medical cart computers with triple hot swap batteries can operate 24/7 by using a set of batteries during a shift while others charge, ensuring a constant uptime. This computer design frees up AC power tethering so staff aren't connecting and disconnecting computers as they make their rounds, dealing with tedious hardware restrictions that distract from patient care.

These design factors, when examined in detail, are more sensible to include in a computer build for hospitals. Medical grade computing goes beyond the standard into a more conscious realm of mobile computing, safeguarding against the invisible agent—microbes and germs—and ensuring that patient care is of the utmost concern.

How Will These Computers be Used at Point of Care?

When browsing for a retail computer, there's a process in sales called "qualifying." What will you use the computer for, and which computer fits the needs of your purpose? The same questions apply here—the range of functions for each medical computer can vary depending on the integrated peripherals it's customized with, the mobility of the computer, power capability, size, and other factors. Consider how your computer deployment will be used so you can tailor it to the needs of the hospital and staff.

Mobility Needs Mobile Power

Bedside charting needs high mobility, so a computer with sufficient battery power will do. If the computer is cart-mounted, are the carts powered or non-powered? If they're non-powered, what is the battery capability and capacity for the computer? Since hospital care is a 24/7 operation, non-powered cart computers will need constant hot-swap battery capability and external power support for any extra peripherals, such as a scanner or printer. These kind of medical computers are considered complete patient care solutions since they combine mobility, safety, and patient entertainment in a compact, all-in-one design.

A Secure Computer Everyone Will Use

Patient infotainment is another possible purpose for the computer—a combination

of using EMR software to display a patient's vital signs mixed with a system to entertain the patient during their stay. If the computer will be stationary in a hospital room for both patient and medical staff use, they'll need to be VESA mountable as well with an integrated touch screen for everyone to easily use. EMR software systems can inform patients of their ailments and educate them on how to treat their problems when they've been released. Medical staff can use log in using an RFID badge or a fingerprint scanner, and then log off when they are done. The patient can then access the infotainment features on the computer without being able to access the EMR software. This dual-functionality frees up time for staff to focus on their work, ensuring maximum productivity and patient satisfaction.

The Rising Tech of Telehealth

Where will the computer be used? One of the biggest challenges that healthcare providers face in rural areas and poorer areas is the ability to not just provide patients with great care, but to even reach those patients. These populations are either spread out with no easy access to a hospital or a doctor, or simply don't have the means to take time off of work to visit a doctor for routine work. When routine visits and tests are skipped, more serious issues get missed, creating much bigger and more expensive issues down the road. Providing preventative care in these communities is a huge challenge.

The rise of more mobile technology has expanded the "hospital" to address these challenges. A medical computer or medical tablet being used in the field requires robust battery technology that ensures

constant uptime for patients that need intensive monitoring, whether they're in a hospital setting or at home. This includes blood testing, and remote diagnostics, medical record updating and even telehealth applications. Now, virtual appointments are a reality. Patients can connect with doctors via video conference calls using an integrated webcam, but medical computers require sufficient wireless technology to achieve that level of tech—requiring a secure intel wireless chip and 3/4G technology if WiFi isn't available—a feature that isn't often included with retail desktop computers.

What will the Computer Operate?

What kind of medical devices will the computer run? Will it be attached to lab equipment for blood testing? Will the computer be used for medication dispensing? All device functions must be identified before a proper choice can be made about what medical computer is right for the job—this dictates what extra peripherals may be required for proper use. For instance, if the computer is used for medication purposes, you'll need a barcode scanner for error-free medication tracking. If the computer needs to utilize mobile lab equipment for blood testing, ensure it has external power capability to sufficiently run whatever lab equipment is necessary.

How Will Security and Patient Privacy Be Maintained?

A large concern for hospitals is the adherence to HIPAA rules and regulations to avoid violations of the legislation and to

protect the information of all patients. HIPAA violations happen all the time, and if staff isn't sensitive to the information transfer around them there could be legal consequences. That's why it's a proper idea to ensure all patient data is handled with medical computers that have information security protocols in place.

Secure Sign-On for Medical Computers

One of these protocols is called Imprivata Single Sign-On, a well-established authority in the realm of authentication. This particular security feature is only acceptable on certified hardware. This ensures HIPAA legislations are far from being breached and patient information can't be easily retracted from the computer. By utilizing integrated biometric readers and Radio Frequency Identification (RFID), medical staff can use two-factor authentication to ensure the strictest access controls without having to remember large passwords or type them in constantly. By removing the human element—forgetfulness, loss, other factors—medical staff can access patient information with minimized risk of HIPAA violations. Two-factor authentication is recommended in most medical facilities, but in some states it's required. Be sure to research if your state requires two-factor authentication; that will inform you of the type of computer deployment you'll need.

Encrypted Data Protects Patients

A patient's medical records are actually very valuable on the black market—more valuable than credit card numbers! All it takes is someone to pull out a drive and place it into an external reader or different

computer to get patient and prescription information—unless the data is encrypted. Medical computers use a cryptoprocessor called a Trusted Platform Module (TPM) that encrypts the stored data on the computer's drive. If the drive is misplaced or stolen, this device ensures that the information can't be deciphered or read by another computer. This adds another layer to avoid HIPAA violations and protect the sensitive information of a patient. Without this module, information is at risk. Ensure your computer deployment has some method of encrypting data.

Are the Medical Computers Compatible with my Software?

Select Supportive Screens

It's important to recognize not all medical computers are created equal. Some must have robust features and technical prowess under the hood to run the latest in EMR software. Epic, for example, requires a 24-inch screen to display all pertinent information - so if your choice of medical computers falls below that requirement, that decision will turn into a waste of time and money for running Epic. Some medical device applications require a smaller screen with a 4:3 ratio, so be cognizant about what your selected software requires to run efficiently. If your screen aspect ratio and EMR software aren't compatible, it will warp the operating perspective of the software. Or it may not run at all.

If the medical computer in question is being used to process surgical imaging,

it's highly advised to find a solution with the highest resolution possible—the top technology on the market uses 4k resolution so surgeons and physicians can clearly see tissue during operations such as an endoscopy. A lower resolution isn't fit for surgical applications and won't provide the clarity necessary for proper surgical procedures and diagnosis. The video card must be a powerful card too—4k monitors are very demanding screens, and require top NVIDIA cards to reproduce shared video and clear images. Stay attentive to what the medical computer will be used for, and your purchasing decision will be the correct one for your hospital or clinic.

Ensure the Fewest Possible Variables

The focus for a lot of EMR systems is complete interoperability. Without this key software design factor, communication between conflicting EMR systems can turn into a complicated, time-consuming mess. It's best to deploy a series of computers that are capable of running the latest EMR systems, so software compatibility and data transferring remains a low-maintenance operation and medical staff can focus on patient care rather than incommunicable software and hardware. In order to keep the continuing care document (CCD) intact and readable by all systems, it's best to deploy your EHR system on one line of computers.

Customize the Computer

One of the most popular uses for Epic is the anesthesia module available for Epic customers. Epic's interoperability with other programs is highly rated, and the anesthesia modules work well with other

programs to transfer data. However, regardless of the application, Epic software requires the Skylake processor, a minimum to run its complex code. So it's not just a matter of screen size, resolution, video card, and hardware-to-hardware compatibility, but the minimum required specifications for the processor, memory, and storage capacity. Try to find a hardware provider that gives you full customization options—those are the best vendors to choose from because you can scale your system power to whatever application it's meant for.

Is There Full Support from the Manufacturer on a Product Cycle and Component Level?

Extensive Product Life Cycle Support

Purchasing a computer deployment isn't just a process of buying the machines and then deploying them. Often times medical computers are purchased and deployed in stages, so it's a good idea to ensure that the computer you purchase in month 1 of a project is exactly the same as the computer you purchase in month 18 of that same project. Proper medical computers have manufacturer life cycles of three to five years, so if a hospital needs the same computer build to operate in a uniform manner across their entire network, those models will still be available. Commercial grade computers update models at a much quicker rate, making it difficult to maintain continuity throughout an extended project timeline. Mixing and matching different computer builds isn't the best way to

achieve uniform operation across a phased deployment.

Heat is a Component Killer

Keep in mind there are computers on the market that are intended to be run 24/7, and consumer-grade computers with a small life cycle average lifespan aren't able to withstand the constant heat, dust, ceaseless running fans, and other factors that are potential hazards for the computer. Heat alone is a huge factor since consumer-grade computers often pull more power—typically 90 watts for the processor—than a medical grade, which is typically 15 watts. Plus, fans are often considered failure points for computers. If a fan fails, an expensive component will follow suit soon.

Ensuring Continuous Computer Care

The lifespans for medical computers, also known as Mean Time Between Failure (MTBF), extend beyond consumer-grade into an average of 5 to 7 years, pushing the enterprise “purchase cycle” beyond what you'd expect. Because of their superior build, extended lifespan, higher-grade, industrial components, and their “always on” design in mind, a medical grade computer is a much stronger choice than what you can purchase off the shelf. That's because a medical grade computer is manufactured with military-grade components with a very high MTBF rating of over 50 thousand hours per component.

We hope it's clear what the proper technology for a medical computer should be. Be sure to answer each question addressed here when selecting your next

medical computer deployment. Cybernet manufactures high-quality, medical grade computers and tablets that adhere to the strictest FDA rules and regulations. All of our computers are backed by our lifetime customer support and extended warranties.

About Cybernet Manufacturing

Cybernet Manufacturing is a global manufacturer of all-in-one PCs and tablets built with military grade components to ensure durability and reliability. Cybernet serves a variety of vertical markets such as health care, industrial, business, banking, and education. Cybernet is privately held, and is headquartered in Irvine, CA, with operations in the United Kingdom, Taiwan, China, and Australia. The company employs 450+ employees worldwide.