

Key Factors for Selecting Medical Cart Power Systems



EXECUTIVE BRIEF

Mobile documentation carts are essential in today's healthcare environments, offering caregivers the flexibility to work wherever they need to, from a patient's bedside to hallways. To protect both users and patients, battery-powered medical carts must be designed and tested to the highest standards. But not all power systems are created equal. This brief highlights the key factors to consider when choosing a power system for your mobile medical carts to ensure caregivers can provide life-changing patient care.

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Selecting a battery-powered system for your line of mobile medical carts should be thoughtfully researched to ensure the safest and most efficient system for your organization.

Runtime

For any battery type, the system runtime largely depends on the load of the equipment. For everyday documentation using an efficient small form factor CPU and one monitor, a typical load could be 30 to 40 watts. For a more demanding case using additional equipment, the load could be 75 watts or more. To calculate the amount of runtime from a single charge, take the size of the battery in watt-hours divided by the load of the system in watts.

$$\text{Runtime (hours)} = \frac{\text{Battery capacity (Wh)}}{\text{IT system load (W)}} \times \text{Power system efficiency}$$

Charge time

You may assume that a system with a larger battery would take longer to charge, but it all depends on the charger. A higher charging current is proportional to the time it takes to recharge a battery. The amount of time the cart is in-use while charging and the amount of load will also impact the charge time. For some systems, the battery may be unable to charge while the cart is in use. An additional power system or battery would be needed for this downtime, unlike carts with power systems that can charge while in use.

Workflow

Hot swap power systems represent a reliable option for providing continuous care. Compared to an integrated power system where the battery always resides on the cart, a hot swap system uses a removeable battery that powers up on a separate centralized charger. Some organizations adopt a hybrid approach to adapt to changing workflows. In this case, common batteries are the best option to maximize equipment efficiency.

Even if most charging will occur on a separate charger, there are benefits to having the option for on-cart charging. Some systems require a separate power supply for this functionality, however, which leads to additional costs and work to maintain clean cable management.

AC vs. DC power

Batteries produce DC power, however, most computer equipment is designed for AC power available through a wall outlet. To ensure you can produce AC power from the battery, an inverter must be part of the power system. The inverter creates a more flexible system that can adapt to changes in equipment—saving costs and time for your IT team. DC systems require special equipment and proprietary cables, and they can quickly become complicated if your cart uses equipment with different voltage requirements.

Total cost of ownership

In any environment, cost is top-of-mind for executives and budget holders, including in healthcare. Organizations should look beyond the initial purchase price and consider other factors that impact long-term costs, such as runtime, charge time, warranty, cost and frequency of battery replacement, frequency of service and cost of a service call. Weighing all these criteria will provide a holistic picture of the total financial investment.

Warranty

When comparing various systems, be sure to decipher the specifics included in the warranty language, especially how the battery warranty is measured. Make sure you understand what constitutes a cycle, as this can significantly affect the warranty if a cart is regularly plugged in for short periods of time. The warranty should also specify the guaranteed percentage of original capacity or battery health during the warranty period.

Service

Preventative service packages available through the manufacturer ensure the ongoing health of your battery-powered medical carts. Proactively servicing your fleet through certified support professionals helps reduce interruptions that impact patient care. Fleet management software—either pre-loaded or available for future download—can monitor your carts in real time to help reduce downtime and streamline maintenance.

Safety control and testing

To select the safest medical cart, choose an option with redundant controls in the power module to control the charging process and detect battery temperature and voltage—an especially important feature for lithium cells. Adequate venting and airflow, electrical wiring systems, and fusing are all critical to the safety of the cart. All batteries should undergo aggressive testing by the manufacturer, including puncturing or shorting the battery to ensure it does not experience thermal runaway.

Certifications

When in doubt, look for proper certifications related to the safety of the entire power system. Testing also ensures electrical safety, mechanical safety and electromagnetic interference issues that can impact uptime, along with patient and caregiver safety.

CONCLUSION

Selecting a battery-powered system for your line of mobile medical carts should be thoughtfully researched to ensure the safest and most efficient system for your organization. While each system offers unique features, LiFe battery technology is often an ideal fit for healthcare environments due to its overall safety and reliability. Mobile medical carts with the right power system allow physicians and nurses to spend less time focused on the technology and more time on what's most important—the patient.

Learn more about LiFe battery technology and battery safety in our [Power Life-Changing Care with Safe Battery Technology white paper](#).

^[1] Battery University - http://batteryuniversity.com/learn/article/types_of_lithium_ion

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For more information:

Americas: 800.888.8458 / +1.651.681.7600 / insidesales@ergotron.com

EMEA: +31.33.45.45.600 / info.eu@ergotron.com

APAC: apaccustomerservice@ergotron.com

Custom: custom@ergotron.com

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